The Kingdom of Eswatini

Eswatini Water and Agricultural Development Enterprise (EWADE)

Invitation To Tender (ITT) Document

for the Procurement of Works

Procurement Method:	**Open Tender**
Subject of Procurement:	**Bush Clearing, Land Preparation, Supply and Installation of Irrigation System, Testing and Commissioning of 10 Ha at Dinabanye Chiefdom under the Matsanjeni South Inkhundla**
Procurement Reference Number:	**EWADE/0797**
Date of Issue:	**15th October 2026**
Participation	**Local**

PREFACE

This Tender Document has been prepared by the Eswatini Public Procurement Regulatory Agency to be used for the procurement of Works.

The document is customized to be consistent with the Public Procurement Act No. 07 of 2011, the Public Procurement Regulations, 2020, other of the Laws of Eswatini, and international best practices".

This Invitation to Tender (ITT) shall be used to procure Works above E500,000.

The sale of this tender document to potential Contractor(s) is discouraged.

Those wishing to submit comments or questions on this Tender Document or to obtain additional information are encouraged to contact:

The Chief Executive Officer
Eswatini Public Procurement Regulatory Agency
RHUS Office Park, P.O. Box 9665
Karl Grant Street, Mbabane
ESWATINI
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LIST OF ACRONYMS

TDS	Tender Data Sheet
TS	Tender Security
TSD	Tender Securing Declaration
ESHS	Environmental, Social, Health and Safety
GCC	General Conditions of the Contract
ITT	Instruction to Contractors.
JV	Joint Venture
PE	Procuring Entity
STD	Standard Tender Document
SCC	Special Conditions of the Contract
SOR	Statement of Requirements.
TCS	Technical Compliance Selection

Tender Document
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Eswatini Water & Agricultural Development Enterprise

Standard Invitation to Contractors

TENDER NOTICE UNDER REQUEST FOR QUOTATION - EWADE/0797

15th October 2026

Bush Clearing, Land Preparation, Supply and Installation of Irrigation System, Testing and Commissioning of 10 Ha at Dinabanye Chiefdom under the Matsanjeni South Inkhundla

1. The Eswatini Water and Agricultural Development Enterprise has allocated/received funds to be used for the acquisition of contractor for the Bush Clearing, Land Preparation, Supply and Installation of Irrigation System, Testing and Commissioning

2. The Entity invites sealed Tenders from eligible Contractors, registered with the Construction Industry Council of Eswatini (CIC) under Category C4 Only, for the provision of the above works.

3. Tendering shall be conducted in accordance with the procedures contained in the Public Procurement Act of 2011 and the Regulations of 2020.

4. Interested eligible Contractors may obtain further information about the tender document at the address given below at 8(a) from 0*800hrs to 1600hrs, Monday - Friday.*

5. The Tender document which has been prepared in the *English language* may be obtained by interested Contractors at 8(b) upon payment of a non-refundable fee of E350. The method of payment will be through cash or EFT *with* effect from 15th October 2026 *until date of pre-bid meeting 23rd October 2026.*
   The account to use for EFT or bank transfer are as follows:
   Account details for foreign & Local currency.
   Bank: NEDBANK ESWATINI
   Account name: Commercial Wing Department
   Account number: 11990269019
   Branch: 360164
   SWIFT Code: NESWSZMX

6. Tenders must be delivered to the address indicated below at 9(c) at or before 10am; *12th November 2026.* All Tenders must be accompanied by a Tender security of *E20,000.00 (Twenty Thousand Emalangeni).* Tender securities must be valid until 12th *March 2027.* Late Tenders shall be rejected. Tenders will be opened in the presence of the Contractors' representatives who choose to attend at the address below at 8(d) at *10.15am, 12th November 2026.*

7. There shall be a mandatory pre-tender meeting/site visit at EWADE Ndzevane Office (Coordinates: 26º 57' 03.32" S, 31º 57' 02.75" E) on the dates indicated in the proposed schedule in this notice.

EWADE
Making A Difference

EWADE Building, Siphofaneni (MR8) | P.O. Box 198
Siphofaneni | Tel: (+268) 2411 8600 | Fax: (+268) 2404 7954.
Email: info@ewade.co.sz | Web: www.ewade.co.sz

Eswatini Water & Agricultural Development Enterprise

8. Address and Contact Details:

(a)	Information about the tender may be accessed from:	Eswatini Water and Agricultural Development Enterprise (EWADE) EWADE Building Siphofaneni MR8 Eswatini
(b)	Documents will be issued from:	Eswatini Water and Agricultural Development Enterprise (EWADE) EWADE Building Siphofaneni MR8 Eswatini **Tel. 2411 8600**
(c)	Tenders must be delivered to:	The Tender Box Eswatini Water and Agricultural Development Enterprise (EWADE) EWADE Lubovane Damsite Office PO Box 198 Siphofaneni Eswatini **Tel. 2411 8600**
(d)	Address of Tender opening:	Eswatini Water and Agricultural Development Enterprise (EWADE) EWADE Lubovane Damsite Boardroom PO Box 198 Siphofaneni

9. The Planned Procurement Schedule (subject to changes) is as follows:

Activity	Date
(a) Issue of invitation to tender letter	15th October 2026
(b) Pre-Tender meeting/ Site visits where applicable	23rd October 2026, 1000hrs
(c) Tender closing date	12th November 2026, 1000hrs
(d) Tender opening date	12th November 2026, 1015hrs
(e) Evaluation process	20th November 2026
(f) Notification and Publication of Notice of Intention to Award	04th December 2026
(g) Contract Award	07th December 2026

Signature:
Name:
Position of Authorised Official:

PART 1 - Tender Procedures

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Section 1: Instructions to Tenderers

A. General

1. Scope of Tender

1.1 The Procuring Entity (PE), as defined in the Tender Data Sheet (TDS), invites Tenders for the construction of works, as described in the TDS. The name and procurement reference number of the Contract and number of lots in this Tender Document are provided in the TDS. The Instructions to Tenderers (ITT) should be read in conjunction with the TDS.

1.2 The successful Contractor will be expected to complete the works by the Intended Completion Date specified in the Special Conditions of Contract (SCC).

1.3 Throughout this Tender document:

(a) the "Contractor" means the service provider.
(b) "day" means calendar day unless specified as working day.
(c) "day works" means varied work inputs subject to payment on a time basis for the Contractor's employees and Equipment, in addition to payments for associated Materials and Plant.
(d) the "Employer" means the Procuring Entity.
(e) "ESHS" means environmental, social (including sexual exploitation and abuse (SEA) and gender -based violence (GBV)), health and safety.
(f) "in writing" means hand-written, type-written, printed or electronically made, and resulting in a permanent record.

2. Source of Funds

2.1 The PE has an approved budget from Embassy of the Republic of China (Taiwan) in the Kingdom of Eswatini through the Government of Eswatini towards the cost of the procurement named in the TDS. The PE intends to use these funds to place a contract for which this Tender Document is issued.

2.2 Payments will be made directly by the PE and shall be subject to the terms and conditions of the resulting contract placed by the PE.

3. Corrupt and Fraudulent Practices

3.1 It is the policy of the Government of The Kingdom of Eswatini through ESPPRA to require that PEs, as well as Contractors Sub- observe the highest standards of ethics during procurement and the execution of contracts.

(a) In pursuit of this policy, the Government of Eswatini defines for the purposes of this provision, the terms set forth below as follows:
  (i) "corrupt practice" means the offering, giving, receiving, or soliciting, directly or indirectly, of anything of value, to influence the action of a public official in the procurement process or in contract execution;
  (ii) "fraudulent practice" means as any such practices under the code of ethics of the providers and not limited to misrepresentation of facts in order to influence a procurement or process or the execution of a contract to the detriment of the procuring or disposing entity, and includes collusive practices among Contractors prior to or after Tender submission designed to establish Tender prices at artificial non-competitive levels and to deprive the PE of the benefits of free and competitive competition;
(b) The PE shall reject a recommendation for award if the Contractor recommended for award has engaged in corrupt or fraudulent practices; and
(c) The Agency shall suspend a contractor from engaging in any public procurement proceedings for a stated period of time in accordance with the Procurement Act and the Regulations made under the Act, if the provider has engaged in corrupt or fraudulent practices.

3.2 In pursuit of the policy defined in ITT Sub-Clause 3.1, the PE may terminate a contract for works, if it at any time determines that corrupt or fraudulent practices were engaged in by representatives of the PE or of a Contractor or sub-Contractor during the procurement or the execution of a contract.

3.3 In further pursuit of the policy defined in ITT Sub-Clause 3.1, the Agency requires representatives of both the PE and of Contractors and sub-Contractors to adhere to the relevant codes of ethical conduct. The Code of Ethical Conduct for Contractors and Providers as provided in the Tender forms shall be signed by the Contractor and submitted together with the other Tender forms.

3.4 Any communications between a Contractor and the PE related to matters of alleged fraud or corruption must be made in writing and addressed to the Controlling Officer of the PE.

4. Eligible Contractors

4.1 A Contractor, and all parties constituting the Contractor, shall meet the following criteria to be eligible to participate in public procurement:

(a) The Contractor has the legal capacity to enter into a contract with the PE;

(b) The Contractor is not:

(i) Insolvent;

(ii) In receivership;

(iii) Bankrupt; or

(iv) Being wound up

(c) The Contractor's business activities have not been suspended;

(d) The Contractor is not the subject of legal proceedings for any of the circumstances in (b); and

(e) The Contractor has fulfilled his or her obligations to pay taxes and social security contributions.

(f) The Contractor is not a member of the Entity Tender Board or an employee of the Procuring Entity.

4.2 A Contractor may be a physical person or artificial person, such as an entity. A combination of persons can Tender if they have an agreement to form a Joint Venture (JV), Consortium or Association. Such a Tender shall include a Power of Attorney from each party authorizing a representative to conduct all business for and on behalf of the party during the Tender process, contract signature and contract execution. Each party to the JV, Consortium or Association shall be a signatory to the contract with the PE and shall be jointly and severally liable.

4.3 A Contractor, and all parties constituting the Contractor including sub-contractors, shall have the nationality of an eligible country, in accordance with Section 5, Eligible Countries. A Contractor shall be deemed to have the nationality of a country if the Contractor is a citizen or is constituted, incorporated, or registered and operates in conformity with the provisions of the laws of that country. This criterion shall also apply to the determination of the nationality of proposed subcontractors for any part of the Contract including related services.

4.4 A Contractor shall not have a conflict of interest. Any Contractor found to have a conflict of interest shall be disqualified. A Contractor may be considered to have a conflict of interest with one or more parties in this Tendering process, if the Contractor:

(a) Has controlling shareholding with another Contractor; or

(b) Receives or has received any direct or indirect subsidy from another Contractor; or

(c) Has the same authorized representative for purposes of this tendering process as another Contractor; or

(d) Has a relationship with another Contractor, directly or through common third parties, that puts the Contractor in a position to have access to information about or influence the Tender of another Contractor, or influence the decisions of the PE regarding this tendering process; or

(e) Submits more than one Tender in this Tendering process, except for alternative Tenders permitted under ITT 19. However, this does not limit the participation of subcontractors in more than one Tender, or as Contractors and subcontractors simultaneously; or

(f) Is associated, or has been associated in the past, directly or indirectly, with the consultant or any other entity that has prepared the design, specifications, and other documents for the Project or is being proposed as Project Manager for the Contract. A Contractor that has been engaged by the PE to provide consulting services for the preparation or supervision of the works, and any of its affiliates, shall not be eligible to Tender.

4.5 A Contractor that is suspended by the Agency shall not be eligible to participate in the Tendering process.

4.6 Government-owned enterprises shall be eligible only if they can establish that they are legally and operate under commercial law.

4.7 Contractors shall provide such evidence of their continued eligibility satisfactory to the PE, as the PE shall reasonably request.

4.8 To establish eligibility in accordance with ITT 4, a Contractor shall complete the eligibility declarations in the Tender Submission Sheet, included in Section 4, Tender Forms and submit the documents required in Section 3, Evaluation Methodology and Criteria.

4.9 A Contractor whose circumstances in relation to eligibility change during a procurement process or during the implementation of a contract, shall immediately inform the PE.

4.10 All materials, equipment and services to be used in the performance of the contract shall have as their country of origin an eligible country in accordance with Section 5, Eligible Countries.

5. Qualification of the Contractor

5.1 To establish its qualifications to perform the Contract, the Contractor shall complete and submit:

(a) The Qualification Form provided in Section 4, Tendering Forms; and

(b) The information and documents stated in Section 3, Evaluation Methodology and Criteria.

5.2 The qualifications of the best evaluated Contractor will be assessed as part of a post-qualification in accordance with ITT 40.

6. Joint Ventures, Consortia and Associations

6.1 Tenders submitted by a JV, Consortium or Association shall include a copy of the Joint Venture, Consortium or Association Agreement signed by all parties to the Joint Venture, Consortium or Association Agreement.

6.2 In addition to the requirements under ITT 15.1, Tenders submitted by a joint venture, consortium or association of two or more firms as partners shall comply with the following requirements, unless otherwise stated in the TDS:

(a) The Tender shall include all the information listed in Section 3, Evaluation Methodology and Criteria for each partner;

(b) The Tender shall be signed to be legally binding on all partners;

(c) All partners shall be jointly and severally liable for the implementation of the Contract in accordance with the Contract terms;

(d) One of the partners will be nominated as being in charge and receive instructions for and on behalf of any and all partners; and

(e) The implementation of the entire Contract shall be by the Joint Venture, consortium or association.

7. One Tender per Contractor

Each Contractor shall submit only one Tender, either individually or as a partner in a joint venture, consortium or association. A Contractor who submits or participates in more than one Tender (other than as a subcontractor or in cases of alternatives that have been permitted or requested) shall cause all the Tenders with the Contractor's participation to be rejected.

8. Cost of Tendering

The Contractor shall bear all costs associated with the preparation and submission of his Tender, and the PE shall not be responsible or liable for those costs, regardless of the conduct or outcome of the Tendering process.

9. Site Visit and Pre-Tender Meeting

9.1 The Contractor, at the Contractor's own responsibility and risk, is encouraged to visit and examine the site of works and its surroundings and obtain all information that may be necessary for preparing the Tender and entering into a contract for construction of the works. The costs of visiting the site shall be at the Contractor's own expense.

9.2 The Contractor and any of its authorized personnel or agents shall be granted permission by the PE to enter upon its premises and lands for the purpose of such visit, but only upon the express condition that the Contractor, its personnel, and agents will release and indemnify the PE and its personnel and agents from and against all liability in respect thereof, and will be responsible for death or personal injury, loss of or damage to property, and any other loss, damage, costs, and expenses incurred as a result of the inspection.

9.3 If so indicated in the TDS, the PE will hold a pre-tender meeting or site visit at the time, date and location specified in the TDS to clarify issues and to answer questions on any matter that may be raised at that stage.

9.4 Contractors may submit any questions in writing to the Entity prior to the date of the meeting and may also orally raise questions at the meeting.

9.5 Minutes of the pre-tender meeting, if any was held, including the text of the questions asked by Contractors, without identifying the source, and the responses given, together with any responses prepared after the meeting, will be transmitted promptly to all Contractors who have acquired the Tendering Documents. Any modification to the Tendering Documents that may become necessary as a result of the pre-Tender meeting shall be made by the PE exclusively through the issue of an Addendum pursuant to ITT 12 and not through the minutes of the pre-Tender meeting. Unless otherwise indicated in the TDS, non-attendance at the site visit shall not cause disqualification of a Contractor.

10. Margin of Preference

10.1 Unless otherwise specified in the TDS, a margin of preference shall apply. Where the margin of preference applies, its application and detail shall be specified in Section 3, Evaluation Methodology and Criteria.

B. Tendering Document

11. Content of Tendering Document

11.1 The Tendering Document consists of Parts 1, 2, and 3, which includes all the Sections indicated below, and should be read in conjunction with any addenda issued in accordance with ITT Clause 13.

PART 1 Tendering Procedures

- Section 1. Instructions to Contractors (ITT)
- Section 2. Tender Data Sheet (TDS)
- Section 3. Evaluation Methodology and Criteria
- Section 4. Tendering Forms
- Section 5. Eligible Countries

PART 2 Statement of Requirements

- Section 6. Statement of Requirements

PART 3 Contract

- Section 7. General Conditions of Contract (GCC)
- Section 8. Special Conditions of Contract (SCC)
- Section 9. Contract Forms

11.2 Unless obtained directly from the Employer, the Employer is not responsible for the completeness of the Tendering Documents, responses to requests for clarification, the minutes of the pre-Tender meeting (if any), or Addenda to the Tendering Documents.

11.3 The Contractor is expected to examine all instructions, forms, terms and specifications in the Tendering Document and to furnish with its Tender all information and documentation required by the Tendering Documents.

12. Clarification of Tendering Document

A Contractor requiring any clarification of the Tendering Document shall contact the PE in writing at the PE's address indicated in the TDS. The PE will respond in writing to any request for clarification, provided that such a request is received no later than the date indicated in the TDS. The PE shall forward copies of its response to all Contractors who have acquired the Tendering Document, including a description of the inquiry but without identifying its source. Should the PE deem it necessary to amend the Tendering Document as a result of a clarification, it shall do so following the procedure under ITT 13 and ITT 24.2.

13. Amendment of Tendering Document

13.1 Prior to the deadline for submission of Tenders, the PE may amend the Tendering Document by issuing an addendum.

13.2 Any addendum issued shall be part of the Tendering Document and shall be communicated in writing to all who have obtained the Tendering Document directly from the PE.

13.3 To give Contractors reasonable time in which to take an addendum into account in preparing their Tenders, the PE shall extend the deadline for submission of Tenders by a reasonable period in the event that less than one third of the Tendering period remains after the issue date of the addendum. The PE may, at its discretion, extend the deadline for the submission of Tenders, where more than one third of the Tendering period remains after the date of issue of the addendum.

C. Preparation of Tenders

14. Language of the Tender and Communications

14.1 The Tender shall be in writing.

14.2 The Tender, as well as all correspondence and documents relating to the Tender exchanged between the Contractor and the PE, shall be written in English or unless otherwise specified in the TDS.

14.3 Supporting documents and printed literature that are part of the Tender may be in another language provided they are accompanied by an accurate translation by a competent institution of the relevant passages to the language stated in the ITT Sub-clause 14.2. In which case, for purposes of interpretation of the Tender, such translation shall govern.

15. Documents Comprising the Tender

15.1 The Tender submitted by the Contractor shall comprise the following:

(a) The Tender Submission Sheet, in accordance with ITT 15.2;
(b) A Tender Security or a Tender Securing Declaration in accordance with ITT 20;
(c) Written confirmation authorising the signatory of the Tender to commit the Contractor, in accordance with ITT 22;
(d) Documentary evidence in accordance with ITT 4.8 establishing the Contractor's eligibility to Tender;

(e) A priced Activity Schedule or Bill of Quantities in accordance with ITT 16 and 17;
(f) The Qualification Form and Documents in accordance with ITT 5;
(g) Technical documentation (description of the proposed work method and schedule, including drawings and charts, as necessary) in accordance with ITT 16;
(h) The duly signed Code of Ethical Conduct for Contractors and Providers in accordance with ITT 3.3; and
(i) Any other document(s) required in the TDS.

15.2 The Contractor shall submit the Tender Submission Sheet using the form provided in Section 4, Tendering Forms. This form must be completed without any alterations to its format, and no substitutes shall be accepted. All blank spaces shall be filled with the information requested.

16. Technical Documentation

16 The Contractor shall furnish technical documentation including a statement of work, equipment, personnel, schedule and any other information as stipulated in Section 4, Tendering Forms, in sufficient detail to demonstrate the adequacy of the Contractor's proposal to meet the work's requirements and the completion time.

17. Tender Prices and Discounts

17.1 The prices and discounts quoted by the Contractor in the Tender Submission Sheet and in the Priced Activity Schedules or Bills of Quantities submitted by the Contractor shall conform to the requirements specified below.

17.2 The Contractor shall fill in rates and prices for all items of the works described in the Bill of Quantities. If a Price Schedule shows items listed but not priced, their prices shall be assumed to be included in the prices of other items. Items not listed in the Price Schedule shall be assumed not to be included in the Tender, and provided that the Tender is substantially responsive, the corresponding adjustment shall be applied in accordance with ITT 32.3.

17.3 The price to be quoted in the Tender Submission Sheet shall be the total price of the Tender, excluding any discounts offered. In the event that taxes are not exempt, the price must include any applicable taxes.

17.4 The Contractor shall quote any unconditional and conditional discounts in the Tender Submission Sheet.

17.5 The total Tender price shall be for the whole works based on the priced Activity Schedule or Bill of Quantities submitted by the Contractor.

17.6 The contract price or tender price quoted by the Contractor shall be subject to adjustment during the performance of the Contract if provided for in the SCC and the provisions of Clause 47 of the GCC.

18. Currencies of Tender and Payment

18.1 Tender prices for works and related services originating in and outside Eswatini shall be quoted in Eswatini Lilangeni unless authorised by a competent authority.

18.2 If authorised by the competent authority the Contractor shall utilise the rate of exchange specified in the TDS to express its offer. The source, date and type of exchange rate shall be indicated in ITT 36.

18.3 If authorised by the competent authority, Contractors shall indicate details of their expected foreign currency requirements in the Tender. Foreign currency requirements shall be indicated as a percentage of the Tender price (excluding provisional sums) and shall be payable at the option of the Contractor in up to two foreign currencies, unless otherwise stated in the TDS.

18.4 If authorised by the competent authority, Contractors may be required by the PE to clarify their foreign currency requirements and to substantiate that the amounts included in the lump sum and in the SCC are reasonable and responsive to ITT 18.3.

19. Tender Validity

19.1 Tenders shall remain valid until the date specified in the TDS. A Tender valid for a shorter period shall be rejected by the PE as non-compliant while a Tender valid for a longer period than the date specified in the TDS shall not be rejected but shall only be valid until the date in the TDS.

19.2 The PE shall make its best effort to complete the procurement process within the duration of the validity period specified in the TDS. A PE must ensure the validity of Tenders, Tender securities and Tender securing declarations throughout the procurement process until contract signature.

19.3 In exceptional circumstances, prior to the expiration of the Tender validity period, the PE may request Contractors to extend the period of validity of their Tenders. The request and the responses shall be made in writing. If a Tender Security or a Tender Securing Declaration is requested in accordance with ITT Clause 20, it shall also be extended for a period corresponding to the extension of the Tender validity. A Contractor may refuse to extend its Tender validity period without forfeiting its Tender Security or Tender Securing Declaration. A Contractor who extends the validity periods of its Tender and Tender security or Tender securing declaration shall not be required or permitted to modify its Tender.

20. Tender Security or Tender Securing Declaration

20.1 The Contractor shall furnish as part of its Tender either a Tender Security or a Tender Securing Declaration as specified in the TDS in original form and, in the case of a Tender Security, in the amount and currency specified in the TDS**.**

20.2 If a Tender security is specified pursuant to ITT 20,1, the Tender security shall be a demand guarantee in the amount specified in the TDS and denominated in Eswatini Lilangeni or a freely convertible currency, and shall:

(a) Be issued by a reputable financial institution selected by the Contractor from an eligible country. If the institution issuing the security is located outside Eswatini, it shall be enforceable through a financial institution located in Eswatini.

(b) Be in the form of the Tender security included in section 4, Tendering forms;

(c) Be discharged by the financial institution immediately upon written demand by the PE in case the conditions stated in the Tender security are invoked;

(d) Be included in the Tender and submitted in its original form - copies shall not be accepted.

20.3 The Tender Security or Tender Securing Declaration shall be submitted using the appropriate form included in Section 4, Tendering Forms and shall be valid until the date specified in the TDS.

20.4 Any Tender not accompanied by appropriate Tender Security or Tender Securing Declaration, shall be rejected by the PE as non-compliant.

20.5 The Tender Security of all Contractors shall be returned as promptly as possible once the successful Contractor has signed the contract and provided the required Performance Security and ESHS Performance Security where applicable.

20.6 The Tender Security or Tender Securing Declaration of a JV, Consortium or Association must be issued in the names of all their members or partners.

20.7 The Tender Security may be forfeited, or the conditions of the Tender Securing Declaration executed in the following circumstances:

(a) If a Contractor withdraws its Tender during the period of Tender validity specified by the Contractor in the Tender Submission Sheet, or during any extension thereto;

(b) If a Contractor fails to accept the correction of its Tender price pursuant to ITT Sub-Clause 32.5; or

(c) If the successful Contractor fails to:

(i) Sign the Contract in accordance with ITT 45;

(ii) Furnish a Performance Security and if required in the TDS, the Environmental, Social, Health and Safety (ESHS) Performance Security in accordance with ITT 46.2.

21. Alternative Tenders

21.1 Contractors shall submit offers that comply with the requirements of the Tendering documents, including the basic technical design as indicated in the drawings and specifications. Alternative Tenders shall not be permitted.

22. Format and Signing of Tender

22.1 The Contractor shall prepare one original of the documents comprising the Tender as described in ITT Clause 14 and clearly mark it "ORIGINAL." In addition, the Contractor shall submit copies of the Tender, in the number specified in the TDS, and clearly mark each of them "COPY." In the event of any discrepancy between the original and the copies, the original shall prevail.

22.2 The original and all copies of the Tender shall be signed by the Contractor in the event that he or she is a physical person personally submitting the Tender and in any other event by a person duly authorised to sign on behalf of the Contractor. This authorisation shall consist of a Power of Attorney which if signed in Eswatini shall be registered with the competent authority and if signed outside Eswatini, shall be notarized. The Power of Attorney shall be submitted in the Tender. The name and position held by each person signing the authorisation must be typed or printed below the signature. All pages of the Tender, except for un-amended printed literature, shall be signed or initialled by the person authorized to sign the Tender.

22.3 The Tender shall contain no alterations or additions, except those to comply with instructions issued by the PE, or as necessary to correct errors made by the Contractor, in which case such corrections shall be initialed by the person(s) signing the Tender.

22.4 In the case of Tenders submitted by a JV, Consortium or Association, each member or partner shall nominate a representative through the power of attorney to conduct all business on its behalf during the Tender preparation, Tendering process and contract execution in case of award of the contract. Each representative duly nominated through the power of attorney shall commit each respective member or partner by executing a JV, Consortium or Association agreement providing; that the parties shall jointly submit a Tender, naming the lead member or partner and authorizing the representative of the lead member or partner who was granted power of attorney to sign the Tender.

22.5 Any inter-lineation, erasures, or overwriting shall be valid only if they are signed or initialed by the person signing the Tender.

D. Submission and Opening of Tenders

23. Sealing and Marking of Tenders

23.1 The Contractor shall enclose the original and each copy of the Tender, in separate sealed envelopes or packages, duly marking the envelopes as "ORIGINAL" and "COPY." These envelopes or packages containing the original and the copies shall then be enclosed in one single plain envelope or package securely sealed in such a manner that opening and resealing cannot be achieved undetected and shall be submitted as specified in the TDS.

23.2 The inner and outer envelopes shall:

(a) Bear the name and address of the Contractor;
(b) Be addressed to the PE in accordance with ITT 23.1;
(c) Bear the Procurement Reference number of this Tendering process; and
(d) Bear a warning not to open before the time and date for Tender opening, in accordance with ITT 23.1.

23.3 If all envelopes are not sealed and marked as required, the PE will assume no responsibility for the misplacement or premature opening of the Tender.

24. Deadline for Submission of Tenders

24.1 Tenders must be received by the PE at the address and no later than the date and time indicated in the TDS. When so specified in the TDS, Contractors shall have the option of submitting their Tenders electronically. Contractors submitting Tenders electronically shall follow the electronic Tender submission procedures specified in the TDS.

24.2 The PE may, at its discretion, extend the deadline for the submission of Tenders by amending the Tendering Documents in accordance with ITT 13, in which case all rights and obligations of the PE and Contractors previously subject to the deadline shall thereafter be subject to the deadline as extended.

25. Late Tenders

The PE shall not consider any Tender that arrives after the deadline for submission of Tenders, in accordance with ITT 24. Any Tender received by the PE after the deadline for submission of Tenders shall be declared late, rejected, and returned unopened to the Contractor.

26. Withdrawal and Replacement of Tenders

26.1 A Contractor may withdraw or replace its Tender after it has been submitted at any time before the deadline for submission of Tenders by sending a written notice, duly signed by an authorised representative, which shall include a copy of the authorisation in accordance with ITT 24.2. Any corresponding replacement of the Tender must accompany the respective written notice. All notices must be:

(a) Submitted in accordance with ITT 23 and 24 (except that withdrawals notices do not require copies), and in addition, the respective envelopes shall be clearly marked "Withdrawal," or "REPLACEMENT," and

(b) Received by the Procuring Entity prior to the deadline prescribed for submission of Tenders, in accordance with ITT Clause 24.

26.2 Tenders requested to be withdrawn in accordance with ITT Sub-Clause 24.1 shall be returned unopened to the Contractor.

26.3 No Tender may be withdrawn or replaced in the interval between the deadline for submission of Tenders and the expiration of the period of Tender validity specified by the Contractor in the Tender Submission Sheet or any extension thereof.

26.4 Tenders may only be modified by withdrawal of the original Tender and submission of a replacement Tender in accordance with ITT Sub-Clause 26.1. Modifications submitted in any other way shall not be taken into account in the evaluation of Tenders.

26.5 Contractors may only offer discounts to, or otherwise modify the prices of their Tenders, by withdrawing and replacing their Tender in accordance with this clause, or by including the discount in the original Tender submission in accordance with ITT 17.

27. Tender Opening

27.1 The PE shall conduct the Tender opening in the presence of Contractors` designated representatives who choose to attend, and at the address, date and time specified in the TDS. Any specific electronic Tender opening procedures required if electronic Tendering is permitted in accordance with ITT 24.1 shall be as specified in the TDS.

27.2 First, envelopes marked "WITHDRAWAL" shall be opened and read out and the envelope with the corresponding Tender shall not be opened but returned to the Contractor. No Tender withdrawal shall be permitted unless the corresponding withdrawal notice contains a valid authorisation to request the withdrawal and is read out at the Tender opening.

27.3 All other envelopes including those marked "REPLACEMENT" shall be opened and the relevant details read out. Replacement Tenders shall be recorded as such on the record of the Tender opening. The corresponding tender that is being replaced shall be returned unopened to the contractor.

27.4 Only envelopes or packages that are opened and read out at the Tender opening shall be evaluated.

27.5 All other envelopes shall be opened one at a time, reading out: the name of the Contractor; the Tender price, per lot where applicable, including any discounts; the presence of a Tender Security or Tender Securing Declaration; and any other details as the Procuring Entity may consider appropriate. No Tender shall be rejected at the Tender opening except for late Tenders, in accordance with ITT 25

27.6 The PE shall prepare a record of the Tender opening that shall include, as a minimum: the name of the Contractor and whether there is a withdrawal and/or replacement; the total Tender price or the Tender price per lot if applicable, including any discounts; the presence or absence of a Tender Security or Tender Securing Declaration, and whether a Power of Attorney was submitted. The Contractors' representatives who are present shall be requested to sign the record. The omission of a Contractor's signature on the record shall not invalidate the contents and effect of the record. 27.7 The opened tenders shall immediately to taken to a secure location, where they shall be kept until the evaluation begins.

E. Evaluation of Tenders

28. Confidentiality

28.1 Information relating to the examination, evaluation, comparison, and post-qualification of Tenders, and recommendation of contract award, shall not be disclosed to Contractors or any other persons not officially concerned with such process until information detailing the Best Evaluated Contractor is communicated to all Contractors.

28.2 Any attempt by a Contractor to influence the PE in the examination, evaluation, comparison, and post-qualification of the Tenders or contract award decisions may result in the rejection of its Tender.

28.3 Notwithstanding ITT 28.2, from the time of Tender opening to the time of Contract award, if any Contractor wishes to contact the PE on any matter related to the Tendering process, it should do so in writing.

29. Evaluation of Tenders

29.1 The PE shall use the criteria and methodologies listed in Sectio_ (3, Evaluation Methodology and Criteria. No other evaluation criteria or methodology shall be permitted. By applying the set criteria and methodology, the PE shall determine the Best Evaluated Tender.

29.2 If this Tendering document allows Contractors to quote separate prices for different lots, the methodology to determine the Best Evaluated Tender for a lot shall be as specified in Section 3, Evaluation Methodology and Criteria.

30. Clarification and Changes to Tenders

30.1 To assist in the examination, evaluation, comparison and post-qualification of the Tenders, the Procuring Entity may, at its discretion, ask any Contractor for a clarification of its Tender, including breakdowns of unit rates or prices. Any clarification submitted by a Contractor that is not in response to a request by the PE shall not be considered. The PE's request for clarification and the Contractor's response shall be in writing. No change in the prices or substance of the Tender shall be sought, offered, or permitted, except to confirm the correction of arithmetic errors discovered by the PE in the evaluation of the Tenders, in accordance with ITT 32.

30.2 If a Contractor does not provide clarifications of its Tender by the date and time set in the PE's request for clarification, its Tender may be rejected.

31. Compliance and Responsiveness of Tenders

31.1 The PE's determination of a Tender's compliance and responsiveness is to be based only on the contents of the Tender itself with the exception of findings recorded in the Evaluation Report after a due diligence or post qualification.

31.2 A substantially compliant and responsive Tender is one that conforms to all the terms, conditions, and specifications of the Tendering Document without material deviation, reservation, or omission. A material deviation, reservation, or omission is one that:

(a) Affects in any substantial way the scope, quality, or performance of the Works specified in the Contract; or

(b) Limits in any substantial way, inconsistent with the Tendering Document, the PE's rights or the Contractor's obligations under the Contract; or

(c) If rectified would unfairly affect the competitive position of other Contractors presenting substantially compliant and responsive Tenders.

(d) Impacts the key factors of a procurement including cost, risk, time and quality and causes -

(i) Unacceptable time schedules, where it is stated in the Tendering document that time is of the essence;

(ii) Unacceptable alternative technical details, such as design, materials, workmanship, specifications, standards or methodologies; or unacceptable counter-Tenders with respect to key contract terms and conditions, such as payment terms, price adjustment, liquidated damages, sub-contracting or warranty.

31.3 If a Tender is not substantially compliant and responsive to the Tendering Document, it shall be rejected by the PE and may not subsequently be made compliant and responsive by the Contractor by correction of the material deviation, reservation, or omission.

32. Nonconformities, Errors, and Omissions

32.1 Provided that a Tender is substantially compliant and responsive, the PE may waive any non-conformity or omission in the Tender that does not constitute a material deviation.

32.2 Provided that a Tender is substantially compliant and responsive, the PE may request that the Contractor submit the necessary information or documentation, within a reasonable period of time, to rectify non-material nonconformities or omissions in the Tender related to documentation requirements. Such an omission shall not be related to any aspect of the price of the Tender. Failure of the tender to comply with the request may result in the rejection of its Tender.

32.3 Provided that a Tender is substantially compliant and responsive, the PE shall rectify nonmaterial nonconformities or omissions. To this effect, the Tender price shall be adjusted, for comparison purposes only, to reflect the price of the missing or non-conforming item or component. The cost of any missing items will be added to the Tender price using the highest price from other Tenders submitted.

32.4 Provided that the Tender is substantially compliant and responsive, the PE shall correct arithmetic errors on the following basis:

(a) If there is a discrepancy between the unit price and the total price that is obtained by multiplying the unit price and quantity, the unit price shall prevail and the total price shall be corrected, unless in the opinion of the PE there is an obvious misplacement of the decimal point in the unit price, in which case the total price as quoted shall govern and the unit price shall be corrected;

(b) If there is an error in a total corresponding to the addition or subtraction of subtotals, the subtotals shall prevail, and the total shall be corrected; and

(c) If there is a discrepancy between words and figures, the amount in words shall prevail, unless the amount expressed in words is related to an arithmetic error, in which case the amount in figures shall prevail subject to (a) and (b) above.

32.5 If a Contractor does not accept the correction of errors, the Tender shall be rejected, and the Tender Security may be forfeited or conditions in the Tender Securing Declaration executed.

33. Stages of Evaluation: Using the Technical Compliance Selection Evaluation Method

The evaluation of a Tender for the procurement of works using the technical compliance evaluation method shall be conducted under the following stages:

34. Preliminary Examination of Tenders – Eligibility and Administrative Compliance

34.1 The PE shall examine the legal documentation to establish the eligibility of the Contractors and to verify the validity and authenticity of the documents submitted by the Contractor.

34.2 If after the examination of eligibility, the PE determines that the Tender is not compliant, it shall reject the Tender with the exception of rectification of omissions in accordance with ITT 32.2.

34.3 The PE shall confirm that the following administrative compliance documents and information have been provided in the Tender. If any of these documents or information is missing or contrary to the requirements in the Tendering document, the Tender shall be rejected.

(a) The Tender Submission Sheet duly signed by the authorized representative of the Contractor, including:

- A brief description of the works and related services offered;
- The total price of the Tender; and
- The appropriate duration of the Tender validity;

(b) The Price Schedule;

(c) A Power of Attorney in accordance with ITT 22.2; and

(d) An authentic Tender Security or Tender Securing Declaration, whichever is applicable, in the appropriate form and amount.

34.4 Eligibility and administrative compliance shall be determined on a pass or fail basis and a Tender which is not eligible or administratively compliant shall be rejected at the preliminary stage of evaluation.

35. Technical Evaluation

35.1 The PE shall examine the technical aspects of the Tender submitted in accordance with ITT 16, in particular, to confirm that all requirements of Section 6, Statement of Requirements (SoRs) have been met without any material deviation, reservation or omission.

35.2 The determination shall be based upon an examination of the documentary evidence of the Contractor's qualifications submitted by the Contractor, pursuant to ITT Clause 5, to clarifications in accordance with ITT Clause 30 and the qualification criteria indicated in Section 3, Evaluation Methodology and Criteria.

35.3 If, after the examination of the terms, conditions and requirements, the PE determines that the Tender is not substantially responsive in accordance with ITT 31, it shall reject the Tender.

36. Currency and Exchange Rate

36.1 The currency that shall be used for evaluation purposes for all Tenders shall be Eswatini Lilangeni unless otherwise authorized by a competent authority.

36.2 The exchange rate shall be the prevailing Central Bank of Eswatini exchange rate and shall not precede the tender submission deadline by less than 21 days. Should this date be a non-working day, the selling exchange rate on the date prior to this non-working day shall be used for currency conversion or as otherwise specified in the TDS.

37. Financial Comparison of Tenders

37.1 The PE will evaluate and compare only the Tenders determined to be substantially responsive following Technical Evaluation in accordance with ITT 37.3.

37.2 To financially evaluate a Tender, the PE shall only use the criteria and methodologies defined in this clause and in Section 3, Evaluation Methodology and Criteria. No other criteria or methodology shall be permitted.

37.3 To financially compare Tenders, the PE shall:

(a) Correct any arithmetic errors in accordance with ITT 30.1;

(b) Apply any discounts offered in accordance with ITT 17;
(c) Make adjustments for any deviation that is not a material deviation in accordance with ITT 32;
(d) Convert all Tenders to a single currency in accordance with ITT 18;
(e) Apply any margin of preference, in accordance with ITT 38;
(f) Determine the total evaluated price of each Tender.

37.4 The PE shall consider prices that appear to:
(a) Be unbalanced;
(b) Show a misunderstanding of the requirements; or
(c) Be intended to front load earnings.

37.5 The PE reserves the right to accept or reject any variation, deviation, or alternative offer. Variations, deviations, and alternative offers and other factors which are in excess of the requirements of the Tendering documents or otherwise result in unsolicited benefits for the PE will not be taken into account in Tender evaluation, unless otherwise specified in Section 3, Evaluation Methodology and Criteria.

37.6 The estimated effect of any price adjustment conditions under Clause 47 of the GCC, during the period of implementation of the Contract, will not be taken into account in Tender evaluation, unless otherwise indicated in Section 3, Evaluation Methodology and Criteria.

38. Margin of Preference

38.1 Unless otherwise specified in the TDS, a margin of preference shall apply. Where a Margin of Preference applies, its application and detail shall be specified in Section 3, Evaluation Methodology and Criteria.

38.2 For the purpose of granting a margin of domestic preference, Tenders will be classified in two groups, as follows:
(a) Group A: Swati Company participating alone in the tender *[In accordance with Regulation 12(2) of the Procurement Regulations, 2020]*
(b) Group B: Foreign Company sub-contracting or partnering with a Swati company *[In accordance with Regulation 12(5) of the Procurement Regulations, 2020]*

39. Determination of Best Evaluated Tender

The best evaluated Tender shall be the lowest priced Tender which is eligible, administratively and technically compliant to the requirements specified in the Tendering document.

F. Award of Contract

40. Award Procedure and Notice of Intention to Award

40.1 An award decision by the relevant approvals authority is not a contract. The Contractor with the best evaluated Tender shall be awarded the contract following an adjudication by the relevant approvals authority.

40.2 The PE shall issue a Notice of Intention to Award within five (5) working days after the decision of the relevant approvals authority to all Contractors who participated in the Tendering process and the Agency for publication on its website

40.3 No contract shall be awarded within the period of ten (10) working days after the date of issuance of the Notice of Intention to Award.

40.4 Negotiations will only be held in exceptional circumstances as provided for under the Procurement Act.

41. PE's Right to Accept any Tender and to Reject any or all Tenders

The PE reserves the right to accept or reject any Tender and to cancel the Tendering process at any time prior to contract award, without thereby incurring any liability, subject to adherence to Regulation 26 and 27. of the Public Procurement Regulations of 2020.

42. Confirmation of Award

An award shall be confirmed by acceptance of a Letter of Award by the contractor.

43. Signing and Effectiveness of Contract

43.1 On expiry of the ten (10) working day period after issuance of the letter of appointment to the best evaluated Contractor, the PE shall promptly sign a contract with the successful Contractor.

43.2 Failure by the successful Contractor to promptly sign the contract shall constitute sufficient ground for annulment of the contract award decision and forfeiture of the Tender Security or execution of the Tender Securing Declaration. In that event, the PE may award the Contract to the next best ranked Contractor whose Tender was evaluated at the financial comparison stage.

43.3 Effectiveness of the contract shall be subject to submission of a satisfactory performance security where applicable and any other conditions specified in the Contract.

43.4 A contract shall not be entered into by the Controlling Officer with a Contractor during the period of administrative review.

44. Debriefing of Contractors

44.1 The Contractor shall be provided with information on the reasons for the failure of its Tender after the notice of Intention to Award has been issued. The Procuring Entity shall give the Contractor a written debrief.

45. Performance Security

45.1 Within twenty-one (21) calendar days after signing of the contract, the successful Contractor shall where applicable, furnish to the PE a Performance Security and the Environmental, Social, Health and Safety (ESHS)Performance Security if required in the TDS, in the amount stipulated in the SCC and in the form of an on demand Bank Guarantee as stipulated in Section 9, denominated in the type and proportions of the currencies of the Contract. The Performance Security shall be issued by a Bank located in Eswatini or a foreign Bank through correspondence with a Bank located in Eswatini. Notwithstanding the foregoing and unless the acceptance of a performance security by the procuring entity would be in violation of the laws of Eswatini, a procuring entity shall not reject a performance security on the grounds that the performance security was not issued by the issuer in Eswatini, if the performance security and the issuer otherwise conform to the requirements prescribed in the invitation document.

45.2 Failure of the successful Contractor to submit the above-mentioned Performance Security and the Environmental, Social, Health and Safety (ESHS) Performance Security, if required in the TDS, shall constitute sufficient ground for annulment of the contract award decision. In this case, or where the successful Contractor fails to sign the contract as stated in ITT Clause 43.2, the successful Contractor's Tender Security shall be forfeited, or the conditions of the Tender Securing Declaration shall be executed. In that event, the PE may award the contract to the next best ranked Contractor whose Tender was evaluated at the financial comparison stage.

46. Procurement Related Complaints and Administrative Review

46.1 The procedures for making a Procurement-related Complaint are as specified in the TDS

47. Abnormally Low and Abnormally High Prices

a. Abnormally Low Prices

i. An Abnormally Low Price is one where the financial price, in combination with other constituent elements of the Tender, appears unreasonably low to the extent that the price raises material concerns with the Procuring Entity as to the capability of the Contractor to perform the Contract for the offered price.

ii. In the event of identification of a potentially Abnormally Low Price by the evaluation committee, the Procuring Entity shall seek written clarification from the firm, including a detailed price analysis of its price in relation to the subject matter of the contract, scope, delivery schedule, allocation of risks and responsibilities and any other requirements of the Tendering document.

iii. After evaluation of the price analyses, if the Procuring Entity determines that the firm has failed to demonstrate its capability to perform the contract for the offered price, the Procuring Entity shall reject the firm's Tender.

b. Abnormally High Prices

i. An abnormally high price is one where the proposal price, in combination with other constituent elements of the Tender, appears unreasonably too high to the extent that the Procuring Entity is concerned that it (the Procuring Entity) may not be getting value for money or it may be paying too high a price for the contract compared with market prices or that genuine competition between the Contractors is compromised.

ii. In case of an abnormally high tender price, the Procuring Entity shall make a survey of the market prices, check if the estimated cost of the contract is correct and review the Tendering Document to check if the specifications, scope of work and conditions of contract are contributory to the abnormally high proposals. The Procuring Entity may also seek written clarification from the Contractor on the reason or the high Tender price. The Procuring Entity shall proceed as follows:

iii. If the Tender price is abnormally high based on wrong estimated cost of the contract, the Procuring Entity may accept or not accept the proposal depending on the Procuring Entity's budget considerations.

iv. If specifications, scope of work and/or conditions of contract are contributory to the abnormally high proposal prices, the Procuring Entity shall reject all Tenders and may re-invite for Tenders for the contract based on revised estimates, specifications, scope of work and conditions of contract.

v. If the Procuring Entity determines that the Tender Price is abnormally too high because genuine competition between Contractors is compromised (often due to collusion, corruption or other manipulations), the Procuring Entity shall reject all Tenders and shall institute or cause competent Government Agencies to institute an investigation on the cause of the compromise and copy ESPPRA, before re-inviting tenders.

48. Retention Money Guarantee

"Unless otherwise stated in the Contract, when the Completion Certificate has been issued for the Works and the first half of the Retention Money has been certified for payment by the Engineer, the Contractor shall be entitled to substitute a guarantee, in the form annexed to the Particular Conditions or in another form approved by the Employer and issued by a reputable bank or financial institution selected by the Contractor, for the second half of the Retention Money. The Contractor shall ensure that the guarantee is in the amounts and currencies of the second half of the Retention Money and is valid and enforceable until the Contractor has executed and completed the Works and remedied any defects, as specified for the Performance Security. On receipt by the Employer of the required guarantee, the Engineer shall certify and the Employer shall pay the second half of the Retention Money. The release of the second half of the Retention Money against a guarantee shall then be in lieu of the release after the latest of the expiry dates of the Defects Notification Periods. The Employer shall return the guarantee to the Contractor within 21 days after receiving a copy of the Final Approval Certificate

Section 2: Tender Data Sheet

Instructions to Contractors Reference	Data relevant to the ITT
ITT 1.1	The Procuring Entity is: Eswatini Water and Agricultural Development Enterprise (EWADE)
ITT 1.1	The works consist of: Bush Clearing, Land Preparation, Supply and Installation of Irrigation System, Testing and Commissioning of 10 Ha
ITT 1.1	The Procurement Reference Number of the Contract is: EWADE/0797
ITT 1.1	The number and identification of lots comprising this Tendering Document is: EWADE/0797 The minimum and maximum number of lots a Contractor may Tender for is: One (1) Lot
ITT 9.3	The PE shall be holding a compulsory Pre-Tender meeting or site visit. The Pre-Tender Meeting / Site Visit shall take place at: Location: EWADE Ndzevane Office Boardroom (Coordinates: 26° 57' 03.32" S, 31° 57' 02.75" E) Date: 23rd October 2026, Time: 1000hrs
ITT 9.5	Site visit shall be a **mandatory** requirement.
ITT 12	For clarification purposes only, the Procuring Entity's address is: Attention: The Procurement Manager Physical Address: EWADE Building Siphofaneni MR8 Telephone: 2411 8600 Electronic mail address: tenders@ewade.co.sz
ITT 12	The Procuring Entity will respond to any request for clarification provided that such request is received no later than 1600hrs; 05th November 2026.
ITT 14.2	The language of the Tender shall be English.
ITT 15.1(i)	The Contractor shall submit with its Tender the following additional documents: a) Declaration of Eligibility of Contractor b) Proof of Authority of Signatory c) E 20,000.00 Tender Bond d) Certificate of Attendance at Clarification Meeting e) Original /Valid Tax Compliance Certificate f) Certified copy of Valid Trading License g) Certified copy of Certificate of Incorporation h) Valid Labour Compliance Certificate i) Valid ENPF Certificate j) Certified copy of valid certificate with the CIC under Category C4 Only k) Police Clearance for all Company Directors including finger prints. l) Submission of a Company current Form J, endorsed by the Registrar of Companies m) Submission of a Company current Form C, endorsed by the Registrar of Companies

Instructions to Contractors Reference	Data relevant to the ITT
	n) Submission of certified copies of National Identity documents for the people listed in Form C o) Financial statements not older than 12 months on the date of submission of this tender **ESHS Code of Conduct for Contractor's Personnel** The Contractor shall submit its Code of Conduct that will apply to the Contractor's Personnel to ensure compliance with its Environmental, Social, Health and Safety (ESHS) obligations under the contract. In addition, the Contractor shall detail how this Code of Conduct will be implemented. This will include: how it will be introduced into conditions of employment/engagement, what training will be provided, how it will be monitored and how the Contractor proposes to deal with any breaches. The Contractor shall be required to implement the agreed Code of Conduct. **Environment and Social Management Plan (ESMP)** The Contractor shall be required to submit for approval, and subsequently implement, the Contractor's Environment and Social Management Plan that includes the Strategies and Implementation Plans described below**:** • *[e.g. Traffic Management Plan to ensure safety of local communities from construction traffic];* • *[e.g. Water Resource Protection Plan to prevent contamination of drinking water];* • *[e.g. Boundary Marking and Protection Strategy for mobilization and construction to prevent offsite adverse impacts];* • *[e.g. Strategy for obtaining Consents/Permits prior to the start of relevant works such as opening a quarry or borrow pit];* • *[e.g. Gender based violence and sexual exploitation and abuse (GBV/SEA) prevention and response action plan].* • *[e.g strategy for marking and respecting work site boundaries etc.]*
ITT 18.2	The Authority for specifying rates of exchange shall be the Central Bank of Eswatini.
ITT 18.3	Foreign currency requirements *shall not* be payable in different foreign currencies
ITT 19.1	Tenders must be valid until 12th February 2027.
ITT 20.1	A Tender Security ***shall*** be required.
ITT 20.2	Where a Tender Security is required, the amount and currency of Tender Security shall be E20,000.00 (Twenty Thousand Emalangeni)
ITT 20.3	The Tender Security shall be valid until 12th March 2027.
ITT 22.1	In addition to the original of the Tender, the number of copies required is: ***One (1) original and three (3) copies.***
ITT 23.1	For Tender submission purposes only, the Procuring Entity's address is: Attention: Chairman of the Tender Board Physical Address: EWADE LUSIP Damsite Office Telephone: 2411 8600
ITT 24.1	The deadline for Tender submission is:

Instructions to Contractors Reference	Data relevant to the ITT
	Date: 12th November 2026 Time (SAST): 1000hrs
ITT 27.1	The Tender opening shall take place at: Physical Address: EWADE Lubovane Damsite Office Bardroom Date: 12th November 2026 Time (SAST): 1015hrs
ITT 38.1	A margin of preference ***shall not*** apply. If a margin of preference applies, the application methodology shall be as stated in Section 3 Evaluation Methodology and Criteria.
ITT 38.2	(a) The margin of preference for contractors in Group A shall be: ***Not Applicable*** (b) The margin of preference for contractor in Group B shall be: ***[Not Applicable***
ITT 45.1	The successful Contractor shall be required to submit a - Performance Security - An Environmental, Social, Health and Safety (ESHS) Performance Security. *Not Applicable*
ITT 46.1	The procedures for making a Procurement-related Complaint are detailed in the ESPPRA website https://esppra.co.sz If a Contractor wishes to make a procurement-related complaint, the Contractor shall submit its complaint following these procedures, in writing (by the quickest means available, that is by email), to: **Title/position**: *The CEO* **Procuring Entity**: Eswatini Water and Agricultural Development Enterprise (EWADE) **Email address**: *ewade@ewade.co.sz* In summary, a procurement-related complaint may challenge any of the following: 1. the terms of the Tendering Documents; and 2. the Procuring Entity's decision to award the contract.

Section 3: Evaluation Methodology and Criteria

Procurement Reference Number: EWADE/0768

A. Evaluation Methodology

1. Methodology Used

The evaluation methodology to be used for the evaluation of Tenders received shall be the Technical Compliance Selection (TCS) methodology.

2. Summary of Methodology

2.1 The evaluation shall be conducted in four sequential stages –

(a) A Preliminary Examination to determine the eligibility of Contractors and the administrative compliance of Tenders received;

(b) A Technical Evaluation to determine the technical responsiveness of the eligible and compliant Tenders;

(c) A Financial Comparison to compare costs of the eligible, compliant, responsive Tenders received and determine the best evaluated Tender; and

(d) Post qualification to confirm whether the best evaluated Contractor has the capacity and resources to effectively execute the procurement.

2.2 Failure of a Tender at any stage of the evaluation shall prevent further consideration at the next stage of evaluation. Substantial responsiveness shall be considered a pass at the Technical Evaluation stage.

B. Preliminary Examination Criteria

3. Eligibility Criteria

3.1 The eligibility requirements shall be determined in accordance with ITT Clause 4; and

3.2 The documentation required to provide evidence of eligibility shall be:-

	Eligibility Requirement	Documentary Evidence to be Provided by the Contractor
(a)	The Contractor has legal capacity to enter into the contract	a) Declaration of Eligibility of Contractor b) Proof of Authority of Signatory c) E 20,000.00 Tender Bond d) Certificate of Attendance at Clarification Meeting e) Certified copy of Valid Trading License f) Certified copy of Certificate of Incorporation g) Certified copy of valid certificate with the CIC under Category C4 Only h) Submission of a Company current Form J, endorsed by the Registrar of Companies i) Submission of a Company current Form C, endorsed by the Registrar of Companies

		j) Submission of certified copies of National Identity documents for the people listed in Form C k) Financial statements not older than 12 months on the date of submission of this tender
(b)	The Contractor is not insolvent, in receivership, bankrupt or being wound up, its affairs are not being administered by a court or a judicial officer, its business activities have not been suspended, and it is not the subject of legal proceedings for any of the foregoing	A written declaration signed by the authorised representative of the Contractor. Or Any other evidence
(c)	The Contractor has fulfilled its obligations to pay taxes	Tax Compliance Certificate issued by Tax Regulator
(d)	The Contractor has fulfilled its obligations to social security contributions	Eswatini National Provident Fund Compliance Certificate
(e)	The Contractor adheres to basic labour legislation	Labour Compliance Certificate
(f)	The Contractor does not have a conflict of interest in relation to the procurement requirement	A written declaration signed by the authorised representative of the Contractor
(g)	The Contractor, or any of its directors or officers, have not been convicted of any criminal offence relating to professional conduct or the making of false statements or misrepresentations as to its qualifications to enter into a procurement contract within a period of five years preceding the commencement of procurement proceedings	A written declaration signed by the authorised representative of the Contractor Police clearance or Affidavit *[the document(s) above should relate to the professional and criminal conduct of the contractor]*

(f)	The Contractor is not subject to suspension in accordance with section 55 [of the Public Procurement Act, 2011][1], and none of its directors or officers have been involved in a Contractor or supplier currently subject to suspension	A written declaration signed by the authorised representative of the Contractor

3.3 For Joint Venture or Consortiums or Associations;

(e) A registered Power of Attorney from each member or partner if drawn and signed in Eswatini; or a notarised Power of Attorney if drawn and signed outside Eswatini, nominating a representative to conduct all business on its behalf during the Tender preparation, Tendering process and contract execution in case of award of the contract.

(f) The documentation in Section 3.2 for each member or partner and a copy of the Joint Venture / Consortium / Association Agreement which is legally binding on all partners or members stating that:

(i) The partners or members shall jointly submit a Tender;

(ii) One of the parties will be nominated as lead member or partner to act for and on behalf of all members or partners;

(iii) The authorized representative of the lead member or partner who was granted power of attorney shall sign the Tender;

(iv) In the event that the Tender is successful, the contract shall be executed in the name of the Joint Venture (JV), Consortium or Association and each member or partner shall sign the contract agreement; and

(v) All partners shall be jointly and severally liable for the implementation of the contract in accordance with the contract terms.

4. Administrative Compliance Criteria

The evaluation of Administrative Compliance criteria shall be conducted in accordance with ITT Clause 34.3.

C. Technical Evaluation Criteria

[1] *Refers to suspension by the Eswatini Public Procurement Regulatory Agency*

5. Assessment of Responsiveness

5.1 The assessment of responsiveness will consider the following criteria:

(a) Acceptance of the conditions of the proposed Contract;

(b) Acceptable completion schedule;

(c) Acceptability of the proposed program (work method and schedule), including relevant drawings and charts.

6. Mobilization

Evaluation of the responsiveness of the Tender to the technical requirements will include an assessment of the Contractor's capacity to mobilize key equipment and personnel for the contract consistent with its proposal regarding work methods, scheduling, and material sourcing in sufficient detail and fully in accordance with the requirements stipulated in Section 6 (Statement of Requirements).

6.1 Personnel and Equipment

A. Personnel

The Contractor must demonstrate that it will have the personnel for the key positions that meet the following requirements:

6.1 Personnel

The Tenderer must demonstrate that it has qualified personnel with the relevant recent past experience for the key positions that meet the following requirements, and that the nominated personnel confirm their availability to the Contract for its full duration:

No.	Position	Total Work Experience (years)	Minimum Experience in Similar Works (years)	**Verdict**
6.1.1	Contract Manager	10	7	• <7 yrs. min exp: Fail • >=7 yrs min exp.: Pass Experience must be in Contract Management
6.1.3	Site Agent	10	7	• <7 yrs. min exp: Fail • >=7 yrs min exp.: Pass Experience must be in Irrigation or water-related projects of similar scope and value.
6.1.4	Concrete Supervisor	7	5	Verdict will be allocated to each nominated skilled resource identified as follows: - • <5 yrs. Min exp: Fail • >=5 yrs min exp.: Pass **Min: 8 x Pass**
6.1.5	Pipe Laying Supervisor	7	5	
6.1.6	Roads Supervisor	7	5	
6.1.7	Survey Technician	7	5	
6.1.8	Mechanical Foreman	7	5	
6.1.9	Electrician able to issue electrical compliance certificates	7	5	Verdict will be allocated to each nominated skilled resource identified as follows: • <min No. Skilled: Fail • >=min No. Skilled.: Pass

6.1.10	Quality Controller	7	5	
6.1.11	Health and Safety/ Environmental Officer	7	5	
6.1.12	Number of Skilled Personnel NB. Skilled personnel will include foremen and artisans (Min No. 3)	7	5	Verdict will be allocated to each nominated skilled resource identified as follows: • <min No. Skilled: Fail • >=min No. Skilled.: Pass
	PERSONNEL			**PASS**

Tenderer shall provide details of the proposed personnel and their experience records in the relevant Information Forms included in Section IV, Tender Forms together with contact details of their referees. **Tenderers obtained a FAIL in each of the items mentioned above do not qualify.**

The Contractor shall provide details of the proposed personnel and their experience records in the relevant Forms included in Section IV, Tendering Forms.

B. Equipment

The Contractor must demonstrate that it shall have access to the key equipment listed hereafter (either by ownership, lease, hire): Attach documentary evidence of ownership, lease, hire such as registration books, agreements or memoranda or purchase order).

No.	Equipment Type and Characteristics	Min. Number Required	Verdict
6.1.1	Bulldozer (35-ton, 220 kW minimum)	1	Does not Meet Requirement: Fail Meets Reqt.: Pass
6.1.2	Backactor TLB (50 kW minimum)/ Excavator (32 ton)	1	Does not Meet Requirement: Fail Meets Reqt.: Pass
6.1.3	Tipper Dump trucks (6 cubic metre minimum)	2	Does not Meet Requirement: Fail Meets Reqt.: Pass
6.1.4	Lowbed Transporter and Trailer	1	Does not Meet Requirement: Fail Meets Reqt.: Pass
6.1.5	Servicing vehicle with mobile diesel bowser	1	Does not Meet Requirement: Fail Meets Reqt.: Pass
6.1.6	LDV (Light Delivery Vehicle) 4x4, 130kW, 2-door	1	Does not Meet Requirement: Fail Meets Reqt.: Pass
6.1.7	Concrete Mixer	1	Does not Meet Requirement: Fail Meets Reqt.: Pass
6.1.8	Water Tanker (5,000l minimum)	1	Does not Meet Requirement: Fail Meets Reqt.: Pass
	TOTAL CONTRACTOR'S EQUIPMENT		

The Contractor shall provide further details of proposed items of equipment using the relevant Form in Section 4. **Tenderers obtained a FAIL in each of the items mentioned above do not qualify.**

6.2 Qualification

Factor	Historical Contract Non-Performance						
Sub-Factor	Criteria					**Documentation Required**	**Verdict**
	Requirement	**Contractor**					
		Single Entity	**Joint Venture, Consortium or Association**				
			All partners combined	**Each partner**	**At least one partner**		
6.2.1 History of non-performing contracts	Non-performance of a contract did not occur within the last seven (7) years prior to the deadline for application submission, based on all information on fully settled disputes or litigation.	Must meet requirement by itself or as partner to past or existing JV	N / A	Must meet requirement by itself or as partner to past or existing JV	N / A	Form 5	Does not Meet Requirement: Fail Meets Reqt.: Pass
6.2.2 Pending Litigation	All pending litigation shall in total not represent more than fifty percent (50%) of the Contractor's net worth and shall be treated as resolved against the Contractor**.**	Must meet requirement by itself or as partner to past or existing JV	N / A	Must meet requirement by itself or as partner to past or existing JV	N / A	Form 5A	Does not Meet Requirement: Fail Meets Reqt.: Pass
6.2.3 Declaration: Environmental, Social, Health, and Safety (ESHS) past performance	Declare any civil work contracts that have been suspended or terminated and/or performance security called by an employer for reasons related to the non-compliance of any environmental, or social, or health or safety requirements or safeguard in the past five years[2].	Must make the declaration. Where there are Specialized Sub-contractor/s, the Specialized Sub-contractor/s must also make the declaration.	N/A	Each must make the declaration. Where there are Specialized Sub-contractor/s, the Specialized Sub-contractor/s must also make the declaration.	N/A	Form 5B ESHS Performance Declaration	Does not Meet Requirement: Fail Meets Reqt.: Pass
HISTORICAL CONTRACT NON-PERFORMANCE ***Tenderers obtained a FAIL in each of the items mentioned above do not qualify***							

[2] The Employer may use this information to seek further information or clarifications in carrying out its due diligence.

Factor	Financial Situation and Performance						
Sub-Factor	Criteria					**Documentation Required**	**Verdict**
	Requirement	**Contractor**					
		Single Entity	**Joint Venture, Consortium or Association**				
			All partners combined	**Each partner**	**At least one partner**		
6.2.4 Historical Financial Performance	Submission of audited accounts or other financial statements acceptable to the Employer, for the last 12 months to demonstrate the current soundness of the Contractors financial position and its prospective long-term profitability.	Must meet requirement	N / A	Must meet requirement	N / A	Financial Statements	Does not Meet Requirement: Fail Meets Reqt.: Pass
6.2.5 Average Annual Turnover	Minimum average turnover of 5 million in the past two (2) years, calculated from total certified payments received for contracts in progress or completed, within the last sixty (60) months.	Must meet requirement	Must meet requirement	Must meet _____ percent (50%) of the requirement	Must meet _____ percent (100%) of the requirement	Form 7 and financial statements	Does not Meet Requirement: Fail Meets Reqt.: Pass
6.2.6 Financial Resources	The Contractor must demonstrate access to, or availability of, financial resources such as liquid assets, unencumbered real assets, lines of credit, and other financial means, other than any contractual advance payments to meet: (i) the following cash-flow requirement: E 3,000,000.00 and (ii) the overall cash flow requirements for this contract and its concurrent commitments.	Must meet requirement	Must meet requirement	Must meet _____ percent (50%) of the requirement	Must meet _____ percent (100%) of the requirement	Form 8 and line of credit	Does not Meet Requirement: Fail Meets Reqt.: Pass
FINANCIAL SITUATION AND PERFORMANCE **Tenderers obtained a FAIL in each of the items mentioned above do not qualify**							

Factor	**Experience**						
Sub-Factor	*Criteria*					***Documentation Required***	***Verdict***
	Requirement	***Contractor***					
		Single Entity	***Joint Venture, Consortium or Association***				
			All partners combined	***Each partner***	***At least one partner***		
6.2.7 General Experience	Experience under contracts in the role of contractor, subcontractor, or management contractor for at least Two (2) contracts within the last seven (7) years prior to the Tender submission deadline, each with a value of at least SZL 5 million, and with contract activity in at least six (6) months in each year.	Must meet requirement	N / A	Must meet requirement	N / A	Form 9 and Certificates of Completion or Substantial Completion	No. of Contracts • <2 No. contracts o min value SZL 5 mil. Fail • >=2 No. contracts o min value SZL 5 mil. Pass
6.2.8 Specific Experience	(a) Participation as contractor, management contractor, or subcontractor, in at least Three (3) contracts within the last Seven (7) years, each with a value of at least E3 500,000.00, that have been successfully and substantially completed (at least 70 percent complete) and that are similar to the proposed Works. The similarity shall be based on the physical size, complexity, methods/technology or other characteristics as described in Section 6, Statement of Requirements.	Must meet requirement	Must meet requirements for all characteristics	N / A	Must meet requirement for one characteristic	Form 10 and Certificates of Completion or Substantial Completion	No. of Contracts • <3 No. contracts o min value SZL3.5 mil Fail • >=3 No. contracts o min value SZL3.5 mil Pass

Factor	**Experience**						
Sub-Factor	*Criteria*					***Documentation Required***	***Verdict***
	Requirement	***Contractor***					
		Single Entity	***Joint Venture, Consortium or Association***				
			All partners combined	***Each partner***	***At least one partner***		
6.2.9 Specific Experience	For the above or other contracts executed during the period stipulated in 6.2.8 above, there is a minimum experience in the following key activities: (1) Installation of pipelines. Track record in mPVC, PVC pipelines shall be applicable. (2) Bush Clearing and Land Preparation (min 10 ha and above) (3) Installation of Irrigation System (Pivots and/or Sprinkler and/or Microject and/or drip) (4) Installation of Block Hydrant Valves, Butterfly Valves, Gate Valves, Air Valves etc (5) Construction of gravel rural roads projects (minimum of SZL500,000.00)	Must meet requirements FORM 5	Must meet requirements	N / A	Must meet the following requirements for the key activities listed below (e.g., can be a specialist subcontractor) and must have track records (Completion Certificate) in •Large diameter pipeline Installation •Bush clearing, land preparation & formation •Installation of irrigation system •Installation of irrigation control valves •Construction of gravel rural roads	Form 10 and copies of the contracts providing the scope of the works	**(1) Pipelines** •<1 No. contracts: Fail •>=1 contracts: Pass **(2) Bush Clearing & Land Preparation** •<1 No. contracts: Fail •>= 1 contracts: Pass **(3) Irrigation Systems** •<1 No. contracts: Fail •>= 1 contracts: Pass **(4) Irrigation Valves** •<1 No. contracts: Fail •>= 1 contracts: Pass **(5) Rural Roads** •<1 No. contracts: Fail •>= 1 contracts: Pass

6.3 Works Programme

A work plan (works programme) with brief descriptions of the main tasks, showing the sequence and proposed timetable for implementing the tasks. The tenderer must also submit a comprehensive method statement, with drawings if necessary, showing the methods by which, it proposes to carry out the works. In particular, the tenderer must indicate the critical milestone bar chart showing all activities falling within the critical path. The work plan must indicate a maximum two (2) Consecutive Calendar Months.

Unit	Description	Verdict
1	Work plan indicating the maximum duration	PASS/FAIL
1	Critical Milestone Bar Chart detailing activities on critical path	PASS/FAIL
1	Method Statement	PASS/FAIL

- A critical milestone bar chart showing times and duties allocated for employees for this contract.

Contractors shall also provide information and documentation of: -
(a) Authority to seek references from the Contractor's bankers; and
(b) Foreign firms shall be required to submit proposals for subcontracting components of the works to local (Swati) firms amounting to at least 30% of the Contract Price.

D. Financial Comparison Criteria

7. Costs to be included in the Tender Price

7.1 The financial comparison shall be conducted in accordance with ITT Clause 37.
The following costs shall be included in the Tender price:
(a) the total price given in the Activity Schedule/Bills of Quantities.
(b) day works, if any.

7.2 The following costs shall be excluded from the Tender price:
(a) provisional sums.
(b) the provision for contingencies in the Activity Schedule/ Bills of Quantities.

8. Margin of Preference

8.1 If the TDS specifies a margin of preference is applicable, for the purpose of Tender comparison, the following procedures will apply:

8.2 The PE will first review the Tenders that have reached financial comparison to confirm the appropriateness of the classification, and to identify the Tender group classification of each based upon Contractors' declarations in the Tender Submission Sheet and supporting evidence on ownership/shareholding of the Contractors in accordance with ITT 38.2.

8.3 All evaluated Tenders in each group will then be compared to determine the lowest evaluated Tender of each group. The Tender prices for Contractors in Group A and Group B will be increased by the respective percentages of preference as specified in the Tender Data Sheet. *[For Example: (Tender Price of Contractor Z)- (Tender Price of Contractor Z x percentage specified in the Tender Data Sheet ITT 35.2]*. After application of the preferences, all the Tenders shall be compared, with the lowest-evaluated Tender determined from this comparison selected for the award.

9. Determination of Best Evaluated Tender or Tenders

9.1 Post qualification evaluation will be carried out on the lowest evaluated Contractor as specified below: -

Legal Requirements – Due diligence shall be done to verify ownership of the company and its registration with appropriate body in the country of principal business.

(i) Technical Requirements–Due diligence shall be done to:

(a) Verify and validate the Contractor's performance on previous indicated private and public contracts in the Contractor's submission.

(b) Verify and validate current commitments and litigation record of the Contractor.

(ii) Financial Requirements - Due diligence shall be done to verify and ascertain the Contractor's financial contracting capacity and bank commitment to provide a credit line to the Contractor.

9.2 A Contractor not meeting any of the above criteria shall be rejected.

9.3 The Tender with the lowest evaluated price, from among those which are eligible, compliant and substantially responsive and have passed the post-qualification shall be the best evaluated Tender. If this Tendering Document includes more than one lot, the best evaluated Tender shall be determined separately for each lot.

9.4 Notwithstanding paragraph 9.1, if the Tendering Document allows Contractors to quote different prices for single lots and for the award to a single Contractor of multiple lots, the Procuring Entity shall conduct a further financial comparison to apply any conditional discounts. The Tender or Tenders offering the lowest priced combination of all the lots shall be the best evaluated Tender or Tenders.

Additional Evaluation Criteria (If applicable)

In addition to the evaluation criteria listed in Section 3, the following criteria may apply for the Procuring Entities:

10 Multiple Contracts

If permitted under additional criteria, will be evaluated as follows:

10.1 Award Criteria for Multiple Contracts:

Lots

Contractors have the option to Tender for any one or more lots. Tenders will be evaluated lot-wise, taking into account discounts offered, if any, after considering all possible combinations of lots, the contract(s) will be awarded to the Contractor or Contractors offering the lowest evaluated cost to the Procuring Entity for combined lots, subject to the selected Contractor(s) meeting the required qualification criteria for lot or combination of lots as the case may be.

Section 4: Tendering Forms

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Tender Submission Sheet

Date: _____
Procurement Reference No_____
To: **ESWATINI WATER & AGRICULTURAL DEVELOPMENT ENTERPRISE LTD**

We, the undersigned, declare that:

(a) We have examined and have no reservations to the Tendering Document, including Addenda No.:……..

(b) We offer to execute in conformity with the Tendering Document and in accordance with the completion schedule specified in the Statement of Requirements and the terms and conditions of the Tendering Document, the following works the Bush Clearing, Land Preparation, Supply and Installation of Irrigation System, Testing and Commissioning of 10 Ha at Dinabanye Chiefdom under the Matsanjeni South Inkhundla

(c) The total price of our Tender, excluding any discounts offered in item (d) below, is _____

(d) The discounts offered and the methodologies for their application are:
Unconditional discounts. If our Tender is accepted, the following discounts shall apply. _____
_____
Methodology of application of the unconditional discounts. The unconditional discounts shall be applied using the following method: _____
_____Cross discounts. If our Tenders for more than one lot are accepted, the following discounts shall apply. _____ *(eg amount/percentage) and* _____
Methodology of application of the cross discounts. The cross discounts shall be applied using the following method: _____
_____ (e) Our Tender shall be valid until the date specified in ITT Sub-Clause 19.1 and it shall remain binding upon us and may be accepted at any time before that date;

(f) If our Tender is accepted, we commit to obtain a Performance Security in accordance with the Tendering Document in the amount of *10% of the total value of the contract price* for the due performance of the Contract.

(g) We, including any subcontractors for any part of the contract resulting from this procurement process, are eligible to participate in public procurement in accordance with ITT Clause 4.1;

(h) We, including any subcontractors for any part of the contract, have nationals from eligible countries
_____
_____

(i) We are eligible for a Margin of Preference in accordance with ITT Clause 38;
[or]
We are not eligible for a Margin of Preference in accordance with ITT Clause 38;

(j) We have signed and undertake to abide by the Code of Ethical Conduct for Contractors and Providers during the procurement process and the execution of any resulting contract;

(k) We accept the appointment of *[name proposed in GCC 35.1]* as the Adjudicator.
[or]

We do not accept the appointment of *[name proposed in GCC 35.1]* as the Adjudicator, and propose instead that *[name]* be appointed as Adjudicator, whose daily fees and biographical data are attached.

(l) We are not participating, as Contractors, in more than one Tender in this Tendering process, other than alternative Tenders in accordance with the Tendering Document;

(m) We, including any subcontractors, do not have any conflict of interest as stated in ITT 4.4 and are not associated, nor have been associated in the past, directly or indirectly, with the consultant or any other entity that has prepared the design, specifications, and other documents for the Project or that is being proposed as Project Manager for the Contract;

(n) We, including any subcontractors for any part of the contract, have not been suspended by the Eswatini Public Procurement Regulatory Agency from participating in public procurement;

(o) We understand that you are not bound to accept the lowest Tender or any other Tender that you may receive.

Signed: _____

Name: _____

In the capacity of _____Duly authorised to sign the Tender for and on behalf of: _____

Dated on _____ day of _____, _____

Code of Ethical Conduct in Business for Contractors

1. Ethical Principles

Contractors and providers shall at all times-

(a) Maintain integrity and independence in their professional judgement and conduct;

(b) Comply with both the letter and the spirit of-

(i) The laws of Eswatini; and

(ii) Any executed contract.

(c) Avoid associations with businesses and organisations which are in conflict with this code.

2. Standards

Contractors and providers shall-

(a) Strive to provide works, services and goods of high quality and accept full responsibility for all works, services or goods provided;

(b) Comply with the professional standards of their industry or of any professional body of which they are members.

3. Conflict of Interest

Contractors and providers shall not accept contracts which would constitute a conflict of interest with any prior or current contract with any Procuring Entity. Contractors and providers shall disclose to all concerned parties those conflicts of interest that cannot reasonably be avoided or escaped.

4. Confidentiality and Accuracy of Information

(a) Information given by Contractors and service providers in the course of procurement processes, or the performance of contracts shall be true, fair and not designed to mislead.

(b) Service providers shall respect the confidentiality of information received in the course of performance of a contract and shall not use such information for personal gain.

5. Gifts and Hospitality

Contractors and providers shall not offer gifts or hospitality directly or indirectly, to staff of a Procuring Entity that might be viewed by others as having an influence on a procurement decision of the Entity.

6. Inducements

(a) Contractors and service providers shall not offer or give anything of value to influence the action of a public official in the procurement process or in contract execution.

(b) Contractors and service providers shall not ask a public official to do anything which is inconsistent with the Act, Regulations, Guidelines or the Code of Ethical Conduct in Business.

7. Fraudulent Practices

Contractors and service providers shall not-

(a) Collude with other businesses and organisations with the intention of depriving a Procuring Entity of the benefits of free and competitive competition;

(b) Enter into business arrangements that might prevent the effective operation of fair competition;

(c) Engage in deceptive financial practices, such as bribery, double billing or other improper financial practices;

(d) Misrepresent facts in order to influence a procurement process or the execution of a contract to the detriment of the Procuring Entity; or utter false documents;

(e) Unlawfully obtain information relating to a procurement process in order to influence the process or execution of a contract to the detriment of the PE;

(f) Withholding information from the PE during contract execution to the detriment of the PE.

I ..... agree to comply with the above code of ethical conduct in business.

AUTHORISED SIGNATORY	**NAME OF CONTRACTOR**[3]

[3] *If the bidder is a JV, Consortium or Association, state the name of the JV, Consortium or Association*

Form of Tender Security (Bank Guarantee)

Date: _____

Procurement Reference No.: _____

To: _____

Whereas_____

_____ (hereinafter called "the Contractor") has submitted its Tender dated _____ for Procurement Reference number _____ for the construction of _____

KNOW ALL PEOPLE by these presents that We _____of *[*_____ having our registered office at _____ (hereinafter called "the Guarantor") are bound unto _____ (hereinafter called "the Procuring Entity") in the sum of _____ _____for which the Guarantor binds itself, its successors or assignees to make payment to the Procuring Entity.

Sealed with the Common Seal of the said Guarantor this _____day of *[insert month]*, *[insert year]*.

THE CONDITIONS of this obligation are:

(1) If the Contractor withdraws its Tender during the period of Tender validity specified in the Tender submission sheet or as provided in ITT Sub-Clause 19.3 or refuses to accept the correction of its Tender price pursuant to ITT Clause 32.5; or

(2) If the Contractor having been notified of the acceptance of its Tender by the Procuring Entity during the period of Tender validity fails or refuses to:

   (a) Sign the Contract in accordance with the ITT Clause 43.2, if required; or

   (b) Furnish the Performance Security, in accordance with the ITT Clause 45.2 and, if required, the Environmental, Social, Health and Safety (ESHS) Performance Security, in accordance with the Instructions to Contractors ("ITT").

We undertake to pay to the Procuring Entity up to the above amount upon receipt of its first written demand, without the Procuring Entity's having to substantiate its demand, provided that in its demand the Procuring Entity states that the amount claimed by it is due to it, owing to the occurrence of one or more of the above conditions, specifying the occurred conditions.

This security shall remain in force up to and including _____*[insert date, (day, month and year) in accordance with ITT Clause 19.1 or 19.3]* and any demand in respect thereof should be received by the Guarantor no later than the above date.

This guarantee is subject to the Uniform Rules for Demand Guarantees, ICC Publication No. 758, except that sub – article 20 (a) is hereby excluded.

Signed: _____

Name: _____

In the capacity of _____Duly authorised to sign the Tender Security for and on behalf of_____Dated on _____ day of _____(month), _____(year) *[insert date of signing]*

[Use Contractor's Letterhead]
[Name of Contractor]
[Physical Address of Contractor]

Form of Tender-Securing Declaration

Date: _____
Subject of procurement and Ref number.: _____
To: _____

I/We*, the undersigned, declare as follows:

I/We* understand that, according to the conditions of the Tendering Document, Tenders must be supported by a Tender Securing Declaration valid until the date indicated in the Tender Data Sheet (TDS).

I/We* accept that I/we* may be suspended by the Agency from being eligible for Tendering in any public procurement or disposal process if we are in breach of our obligations under the conditions in the Tendering document, because we:

(a) Have withdrawn our Tender during the period of Tender validity specified by us in the Tender Submission Sheet or as provided in ITT Sub-Clause 19.3 or have refused to accept the correction of our Tender price pursuant to ITT Clause 32.5; or
(b) Having been notified of the acceptance of our Tender by the PE during the period of Tender validity, (i) fail or refuse to sign the Contract, if required, or (ii) fail or refuse to furnish the Performance Security, in accordance with ITT 45.2 or and, if required, the Environmental and Social (ES) performance securing declaration.

I/We* understand this Tender Securing Declaration shall cease to be valid if I am/we are* not the successful Contractor, upon the earlier of:

(i) The expiry of the notice of best evaluated Contractor without any pending administrative review application; or
(ii) Twenty-eight (28) days after the expiration of the validity of my/our* Tender.

Signed:
_____
_____
Name: _____

Duly authorized to sign the Tender for and on behalf of: _____

Dated on _____ day of _____(month), _____ (year) *[insert date of signing]*
Corporate Seal (where appropriate)

[Note: In case of a Joint Venture, Consortium or Association the Tender Securing Declaration must be in the name of all partners that submit the Tender and signed by the representative duly authorized by the partners.]
Please delete as appropriate

Technical Documentation

1. Site Organization
2. Method Statement
3. Mobilization Schedule
4. Construction Schedule
5. Environmental and Social Management Plan
6. Code of Conduct for Contractor's Personnel
7. *[Insert any other relevant documentation]*

Site Organization

Provide a detailed description/illustration of the proposed site organization in terms of personnel, offices, materials storage, workshops etc.

Method Statement

Provide a detailed description of the proposed method statement to execute the works

Mobilization Schedule

Provide a detailed description/illustration of the proposed mobilization schedule for materials, equipment, labour etc. including sources.

Construction Schedule

Provide a detailed description/illustration of the proposed construction schedule.

Environmental and Social Management Plan

a) *The Contractor shall submit comprehensive and concise Environment Social Health and Safety Management Plan as required by ITT 15.1 (i) of the Tender Data Sheet. This plan shall describe in detail the actions and management processes etc. that will be implemented by the Contractor, and its subcontractors.*
b) *In developing these strategies and plans, the Contractor shall have regard to the ESHS provisions of the contract including those as may be more fully described in the Statement of Requirements in Section 6.*

Code of Conduct for Contractor's Personnel Form

Note to the Contractor:

The minimum content of the Code of Conduct Form as set out by the Employer shall not be substantially modified. However, the Contractor may add requirements as appropriate, including to take into account Contract-specific issues/risks.

The Contractor shall initial and submit the Code of Conduct Form as part of its bid.

CODE OF CONDUCT FOR CONTRACTOR'S PERSONNEL

We……., [*enter name of Contractor*], undertake that once we are awarded the contract for …….[*enter description of the works*] to be carried out at [*enter the site and other locations where the works will be carried out*] shall implement measures to address environmental and social risks related to the works, including the risks of sexual exploitation and assault and gender-based violence.

This Code of Conduct is part of our measures to deal with environmental and social risks related to the works. It applies to all our staff, labourers and other employees at the Works Site or other places where the works would be carried out. It also applies to the personnel of each subcontractor and any other personnel assisting us in the execution of the Works. All such persons are referred to as "**Contractor's Personnel"** and are subject to this Code of Conduct.

This Code of Conduct identifies the behaviour that we require from all Contractor's Personnel. Our workplace is an environment where unsafe, offensive, abusive or violent behaviour will not be tolerated and where all persons should feel comfortable raising issues or concerns without fear of retaliation.

REQUIRED CONDUCT

Contractor's Personnel shall:

1. Carry out his/her duties competently and diligently;
2. Comply with this Code of Conduct and all applicable laws, regulations and other requirements, including requirements to protect the health, safety and well-being of other Contractor's Personnel and any other person;
3. Maintain a safe working environment including by:
    a. Ensuring that workplaces, machinery, equipment and processes under each person's control are safe and without risk to health;
    b. Wearing required personal protective equipment;
    c. Using appropriate measures relating to chemical, physical and biological substances and agents; and
    d. Following applicable emergency operating procedures.
4. Report work situations that he/she believes are not safe or healthy and remove himself/herself from a work situation which he/she reasonably believes presents an imminent and serious danger to his/her life or health;
5. Treat other people with respect, and not discriminate against specific groups such as women, people with disabilities, migrant workers or children;
6. Not engage in any form of sexual harassment including unwelcome sexual advances, requests for sexual favours, and other unwanted verbal or physical conduct of a sexual nature with other Contractor's or Employer's Personnel;
7. Not engage in Sexual Exploitation, which means any actual or attempted abuse of position of vulnerability, differential power or trust, for sexual purposes, including, but not limited to, profiting monetarily, socially or politically from the sexual exploitation of another.

8. Not engage in Sexual Assault, which means sexual activity with another person who does not consent. It is a violation of bodily integrity and sexual autonomy and is broader than narrower conceptions of "rape", especially because (a) it may be committed by other means than force or violence, and (b) it does not necessarily entail penetration.
9. Not engage in any form of sexual activity with individuals under the age of 18, except in case of pre-existing marriage;
10. Complete relevant training courses that will be provided related to the environmental and social aspects of the contract, including on health and safety matters, and Sexual Exploitation and Assault (SEA);
11. Report violations of this Code of Conduct; and
12. Not retaliate against any person who reports violations of this Code of Conduct, whether to us or the Employer, or who makes use of the [Project Grievance [Redress] Mechanism].

RAISING CONCERNS

If any person observes behaviour that he/she believes may represent a violation of this Code of Conduct, or that otherwise concerns him/her, he/she should raise the issue promptly. This can be done in either of the following ways:

1. Contact_____ _____in writing at this address ……[ ] or by telephone at [……..] or in person at [……]; or
2. Call [……] to reach the Contractor's hotline *(if any)* and leave a message.

The person's identity will be kept confidential, unless reporting of allegations is mandated by the law. Anonymous complaints or allegations may also be submitted and will be given all due and appropriate consideration. We take seriously all reports of possible misconduct and will investigate and take appropriate action. We will provide warm referrals to service providers that may help support the person who experienced the alleged incident, as appropriate.

There will be no retaliation against any person who raises a concern in good faith about any behaviour prohibited by this Code of Conduct. Such retaliation would be a violation of this Code of Conduct.

CONSEQUENCES OF VIOLATING THE CODE OF CONDUCT

Any violation of this Code of Conduct by Contractor's Personnel may result in serious consequences, up to and including termination and possible referral to legal authorities.

FOR CONTRACTOR'S PERSONNEL:

I have received a copy of this Code of Conduct written in a language that I comprehend. I understand that if I have any questions about this Code of Conduct, I can contact ……. [*enter name of Contractor's contact person with relevant experience in handling gender-based violence*] requesting an explanation.

Name of Contractor's Personnel: [insert name]

Signature: _____

Date: (day month year): _____

Countersignature of authorized representative of the Contractor:

Signature: _____

Date: (day month year): _____

Forms for Key Personnel

Form – 1: Proposed Personnel

Contractors should provide the names of suitably qualified personnel to meet the specified requirements for each of the positions listed in Section 3: Evaluation Methodology and Criteria. The data on their experience should be supplied using the Form below for each candidate.

1.	Title of position
	Name
	Duration of commitment for this position
2.	Title of position
	Name
	Duration of commitment for this position
3.	Title of position
	Name
	Duration of commitment for this position
4.	Title of position:
	Name
	Duration of commitment for this position
5.	Title of position: Environmental Officer
	Name
	Duration of commitment for this position
6.	Title of position: Social Development Officer
	Name
	Duration of commitment for this position
etc.	Title of position
	Name
	Duration of commitment for this position

Form – 2: CV of Proposed Personnel

The Contractor shall provide all the information requested below.

Position		
Personnel Information	Name	Date of birth
	Professional qualifications	
	Academic qualifications	
Present Employment	Name of Employer	
	Address of Employer	
	Telephone	Contact (manager / personnel officer)
	Fax	E-mail
	Job title	Years with present Employer

Summarize professional experience in reverse chronological order. Indicate particular technical and managerial experience relevant to the project.

From	**To**	**Project**	**Role**	**Duration in Involvement**	**Relevance Experience**
[Date, Month and Year]	*[Date, Month and Year]*	*[main project details]*	*[role and responsibilities on the project]*	*[time in role i.e. Months and Years]*	*[describe the experience relevant to this position]*

Declaration

I, the undersigned _____certify that to the best of my knowledge and belief, the information in reference to my data contained in the Forms for Key Personnel correctly describes myself, my qualifications and my experience.
I confirm that I am available as certified in the following table and throughout the expected time schedule for this position as provided in the Tender:

Commitment	**Details**
Commitment to duration of contract:	

I understand that any misrepresentation or omission in this Form may:

1. Be taken into consideration during Tender evaluation;
2. Result in my disqualification from participating in the procurement process.

Name of Key Personnel: [*insert name*]

Signature: _____

Date: (day, month, year): _____

Countersignature of authorized representative of the Contractor:

Signature: _____

Date: (day month year): _____

Forms for Equipment

The Contractor shall provide adequate information to demonstrate clearly that it has the capability to meet the requirements for the key equipment listed in Section 3: Evaluation Methodology and Criteria. A separate Form shall be prepared for each item of equipment listed, or for alternative equipment proposed by the Contractor. The Contractor shall provide all the information requested below, to the extent possible:

FORM 3

Type of Equipment		
Equipment Information	Name of manufacturer	Model and power rating
	Capacity	Year of manufacture
Current Status	Current location	
	Details of current commitments	
Source	Indicate source of the equipment ☐ Owned ☐ Rented ☐ Leased ☐ Specially manufactured [Attach evidence of ownership, lease or hire in the form of registration books, agreements or memoranda or purchaser order] [For Specially Manufactured Equipment, attach evidence in form of Proforma Invoices, Quotation or Sales Agreement between the Contractor and the prospective equipment manufacturer]	

The following information shall be provided only for equipment not owned by the Contractor.

FORM 3A

Owner	Name of owner	
	Address of owner	
	Telephone	Contact name and title
	Fax	Telex
Agreements	Details of rental / lease / manufacture agreements specific to the project. (Attach evidence of lease or hire in the form of registration books, agreements or memoranda or purchaser order)	

Qualification Forms

To establish its qualifications to perform the contract in accordance with Section 3: Evaluation Methodology and Criteria. The Contractor shall provide the information requested in the corresponding Information Sheets included hereunder:

Form 4

Contractor Information Sheet

Date: _____

Procurement Reference Number: _____

1. Contractor's Name[1]:
2. In case of JV / Consortium / Association, state name of each party in Form 4A
3. Contractor's Country of Registration / Incorporation[2]:
4. Contractor's Year of Registration / Incorporation[3]:
5. Contractor's Address in Country of Registration / Incorporation[4]:
6. Contractor's Authorized Representative Information Name: Address: Telephone/Fax numbers: Email Address:
7. Attached are copies of original documents of: ☐ Certificate of Incorporation or Registration of firm named in 1, above. ☐ In case of JV / Consortium / Association, the JV / Consortium / Association Agreement ☐ In case of government owned entity from the Procuring Entity's country, documents establishing legal and financial autonomy and compliance with the principles of commercial law.

[1]In case of JV / Consortium / Association, Fill in Form 4A
[2]In case of JV / Consortium / Association, Fill in Form 4A
[3]In case of JV / Consortium / Association, Fill in Form 4A
[4]In case of JV / Consortium / Association, Fill in Form 4A

Form 4 A

Party to JV / Consortium / Association Information Sheet

Date: _____

Procurement Reference Number: _____

1.`Legal Name of party to JV / Consortium / Association:
2. Country of Registration of party to JV / Consortium / Association:
3. Year of Registration of party to JV / Consortium / Association:
4. Legal Address in Country of Registration for party to JV / Consortium / Association:
6. Authorized Representative Information for party to JV / Consortium / Association Name: Address: Telephone/Fax numbers: Email Address:
7. Attached are copies of original documents of: ☐ Certificate of Incorporation or Registration of firm named in 1, above. ☐ In case of government owned entity from the Purchaser's country, documents establishing legal and financial autonomy and compliance with the principles of commercial law.

Form 5

Historical Contract Non-Performance

Contractor's Name: _____ Date: _____

JV/ Consortium / Association Partner Names: _____ Procurement Reference No.: _____

Non-Performing Contracts in accordance with the Technical Criteria			
☐ Contract non-performance did not occur during the stipulated period, in accordance with Sub-Factor 6.2.1 of Section III. ☐ Contract non-performance during the stipulated period, in accordance with Sub-Factor 6.2.1 of Section III.			
Year	Outcome as Percent of Total Assets	Contract Identification	Total Contract Amount
_____	_____	Contract Identification: _____ Name of Employer: _____ Address of Employer: _____ Matter in dispute: _____	_____

Form 5A

Pending Litigation

Pending Litigation, in accordance with Section III			
☐ No pending litigation in accordance with Sub-Factor 6.2.2 of Section III ☐ Pending litigation in accordance with Sub-Factor 6.2.2 of Section III, as indicated below			
Year	**Outcome as Percent of Total Assets**	**Contract Identification**	**Total Contract Amount**
_____	_____	Contract Identification: Name of Employer: Address of Employer: Matter in dispute:	_____
_____	_____	Contract Identification: Name of Employer: Address of Employer: Matter in dispute:	_____
_____	_____	Contract Identification: Name of Employer: Address of Employer: Matter in dispute:	_____

FORM 5 B

Environmental, Social, Health and Safety Performance Declaration

Environmental, Social, Health, and Safety Performance Declaration
in accordance with Section III, Qualification Criteria, and Requirements

☐ **No suspension or termination of contract**: An employer has not suspended or terminated a contract and/or called the performance security for a contract for reasons related to Environmental, Social, Health, or Safety (ESHS) performance since the date specified in Section III, Qualification Criteria, and Requirements, Sub-Factor 6.2.3.

☐ **Declaration of suspension or termination of contract**: The following contract(s) has/have been suspended or terminated and/or Performance Security called by an employer(s) for reasons related to Environmental, Social, Health, or Safety (ESHS) performance since the date specified in Section III, Qualification Criteria, and Requirements, Sub-Factor 6.2.3. Details are described below:

Year	Suspended or terminated portion of contract	Contract Identification	Total Contract Amount (value, currency, exchange rate and Lilangeni equivalent)
[insert year]	*[insert amount and percentage]*	Contract Identification: *[indicate complete contract name/ number, and any other identification]* Name of Employer: *[insert full name]* Address of Employer: *[insert street/city/country]* Reason(s) for suspension or termination: *[indicate main reason(s)]*	*[insert amount]*
[insert year]	*[insert amount and percentage]*	Contract Identification: *[indicate complete contract name/ number, and any other identification]* Name of Employer: *[insert full name]* Address of Employer: *[insert street/city/country]* Reason(s) for suspension or termination: *[indicate main reason(s)]*	*[insert amount]*
…	…	*[list all applicable contracts]*	…

Performance Security called by an employer(s) for reasons related to ESHS Performance

Year	Contract Identification	Total Contract Amount (current value, currency, exchange rate and Lilangeni equivalent)
[insert year]	Contract Identification: *[indicate complete contract name/ number, and any other identification]* Name of Employer: *[insert full name]* Address of Employer: *[insert street/city/country]* Reason(s) for calling of performance security: *[indicate main reason(s)]*	*[insert amount]*

Form 6

Current Contract Commitments / Works in Progress

[The following table shall be filled in for the Contractor, each member of a Joint Venture / Consortium /Association]

Contractor's Name: *[insert full name]*
Date: *[insert day, month, year]*
Joint Venture / Consortium / Association Member's Name: *[insert full name]*
Proc. Reference No: *[insert Reference Number]*
*[*Contractors and each partner to a JV/ Consortium / Association should provide information on their current commitments on all contracts that have been awarded, or for which a letter of intent or acceptance has been received, or for contracts approaching completion, but for which an unqualified, full completion certificate has yet to be issued.*]*

Name of contract	Employer, contact address/tell	Value of outstanding work	Estimated completion date	Average monthly invoicing over last six months (Lilangeni /month)
1.				
2.				
3.				
4.				
5.				
etc.				

FORM 6 A

Financial Situation

Historical Financial Performance

Contractor's Name: _____ Date: _____

JV/ Consortium / Association Partner Legal Name: _____ Procurement Reference No.: _____

To be completed by the Contractor and, if JV/ Consortium / Association, by each partner

Financial information in Lilangeni equivalent	Historic information for previous _____ (__) years (Lilangeni equivalent)						
	Year 1	Year 2	Year 3	Year …	Year n	Avg.	Avg. Ratio
Information from Balance Sheet							
Total Assets (TA)							
Total Liabilities (TL)							
Net Worth (NW)							
Current Assets (CA)							
Current Liabilities (CL)							
Information from Income Statement							
Total Revenue (TR)							
Profits Before Taxes (PBT)							

- Attached are copies of financial statements (balance sheets, including all related notes, and income statements) for the years required above complying with the following conditions:
    - Must reflect the financial situation of the Contractor or partner to a JV, and not sister or parent companies
    - Historic financial statements must be audited by a certified accountant
    - Historic financial statements must be complete, including all notes to the financial statements
    - Historic financial statements must correspond to accounting periods already completed and audited (no statements for partial periods shall be requested or accepted)

Form 7

Average Annual Turnover

Contractor's Name: _____ Date: _____

JV/ Consortium / Association Partner Name: _____

Procurement Reference No.: _____

Annual turnover data (construction only)		
Year	Amount and Currency	Lilangeni equivalent
	_____	_____
	_____	_____
	_____	_____
	_____	_____
	_____	_____
*Average Annual Construction Turnover	_____	_____

*Average annual turnover calculated as total certified payments received for work in progress or completed over the number of years specified in Section III, Sub-Factor 6.2.5, divided by that same number of years.

Form 8

Financial Resources

Specify proposed sources of financing, such as liquid assets, unencumbered real assets, lines of credit, and other financial means, net of current commitments, available to meet the total construction cash flow demands of the subject contract or contracts as indicated in Section 3: Evaluation Methodology and Criteria.

Source of financing	Amount (Lilangeni equivalent)
1.	
2.	
3.	
4.	

FORM 9
Experience

General Experience

Contractor's Name: _____ Date: _____
JV/ Consortium / Association Partner Name: _____
Procurement Reference No.: _____

Starting Month / Year	Ending Month / Year	Years*	Contract Identification	Role of Contractor
_____	_____		Contract name: Brief Description of the Works performed by the Contractor: Name of Employer: Address:	_____
_____	_____		Contract name: Brief Description of the Works performed by the Contractor: Name of Employer: Address:	_____
_____	_____		Contract name: Brief Description of the Works performed by the Contractor: Name of Employer: Address:	_____
_____	_____		Contract name: Brief Description of the Works performed by the Contractor: Name of Employer: Address:	_____
_____	_____		Contract name: Brief Description of the Works performed by the Contractor: Name of Employer: Address:	_____
_____	_____		Contract name: Brief Description of the Works performed by the Contractor: Name of Employer: Address:	_____

*List calendar year for years with contracts with at least nine (9) months activity per year starting with the earliest year

Form 10

Specific Experience

Contractor's Name: _____ Date: _____

JV/ Consortium / Association Partner Name: _____

Procurement Reference No.: _____

Similar Contract Number: ___ *[insert specific number]* of ___*[insert total number of contracts* required.	**Information**		
Contract Identification	_____		
Award date Completion date	_____ _____		
Role in Contract	ϒ Contractor	ϒ Management Contractor	ϒ Subcontractor
Total contract amount	_____		Lilangeni_____
If partner in a JV or subcontractor, specify participation of total contract amount	_____%	_____	Lilangeni_____
Employer's Name:	_____		
Address: Telephone number: E-mail:	_____ _____ _____ _____		

Form 10 A (cont.)

Specific Experience (cont.)

Contractor's Name: _____ Date: _____

JV/ Consortium / Association Partner Name: _____

Procurement Reference No.: _____

Similar Contract No. __*[insert specific number]* of ___*[insert total number of contracts]* required	**Information**
Description of the similarity in accordance with Sub-Factor 6.2.8a) of Section 3: Evaluation Methodology and Criteria.:	
Amount	_____
Physical size	_____
Complexity	_____
Methods/Technology	_____
Physical Production Rate	_____

Form 10 A (b)

Specific Experience in Key Activities

Contractor's Name: _____ Date: _____

JV/ Consortium / Association Partner Name: _____

Procurement Reference No.: _____

	Information		
Contract Identification	_____		
Award date Completion date	_____ _____		
Role in Contract	ϒ Contractor	ϒ Management Contractor	ϒ Subcontractor
Total contract amount	_____		_____
If partner in a JV / Consortium / Association, specify participation of total contract amount	_____%	_____	_____
Employer's Name:	_____		
Address: Telephone number: E-mail:	_____ _____ _____ _____		

Form 10 (b) (cont.)

Specific Experience in Key Activities (cont.)

Contractor's Name: _____ Date: _____
JV/ Consortium / Association Partner Name: _____
Procurement Reference No.: _____

	Information
Description of the key activities in accordance with Sub-Factor 6.2.9 b) of Section III:	

We, the undersigned, declare that the information contained in and attached to these forms is true and accurate as of the date of Tender submission:

Signed: _____ _____
Name: _____ _____
Duly authorised to sign the Qualification Form for and on behalf of _____Dated on _____ day of _____, _____ *[insert day / month / year of signing]*

Form 11

FORM 11: CERTIFICATE OF ATTENDANCE AT CLARIFICATION MEETING

This is to certify that (Tenderer)

of.....(address)

was represented by the person(s) named below at the compulsory meeting held for all tenderers at .....

..... (Location) on ..... (date), starting at .....

We acknowledge that the purpose of the meeting was to acquaint ourselves with the site of the works and / or matters incidental to doing the work specified in the tender documents in order for us to take account of everything necessary when compiling our rates and prices included in the tender.

Particulars of person(s) attending the meeting:

Name ..... Signature .....

Capacity .....

Name ..... Signature .....

Capacity .....

Attendance of the above persons at the meeting is confirmed by the Employer's representative, namely:

Name ..... Signature .....

Capacity ..... Date & Time .....

EWADE STAMP ……

Section 5: Eligible Countries

Procurement Reference Number:

All countries are eligible except countries subject to the following provisions.
A country shall not be eligible if:

(a) As a matter of law or official regulation, the Government of Eswatini prohibits commercial relations with that country, provided that the Government of Eswatini is satisfied that such exclusion does not preclude effective competition for the provision of goods or related services required; or

(b) By an act of compliance with a decision of the United Nations Security Council taken under Chapter VII of the Charter of the United Nations, the Government of Eswatini prohibits any import of Goods from that country or any payments to persons or entities in that country.

PART 2 - Statement of Requirements

Section 6: Statement of Requirements

Contents

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PART A – IRRIGATION TECHNICAL SPECIFICATION

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PORTION 1: THE WORKS

PS 1 APPLICABLE STANDARDISED SPECIFICATIONS

Specifications published by the South African Bureau of Standards (SABS or SANS), series 1200 (Standardised Specifications for Civil Engineering Construction) shall, in general, apply shall apply for all works in so far as quality of workmanship and materials is concerned, or Internationally acceptable standards which guarantee equal or better quality. Although not bound in nor issued with this Document, the following Sections of the Standardised Specifications of SANS 1200 shall form part of this Contract:

(Note: "SABS" has been changed to "SANS", without change to the contents of the specifications).

SANS 1200 A:	General
SANS 1200 C:	Site clearance
SANS 1200 D:	Earthworks
SANS 1200 DB:	Earthworks (Pipe Trenches)
SANS 1200 DK:	Gabions and pitching
SANS 1200 DM:	Earthworks (Roads, Subgrade)
SANS 1200 G:	Concrete (Structural)
SANS 1200 GA:	Concrete (Small Works)
SANS 1200 H:	Structural Steelwork
SANS 1200 HA:	Structural Steelwork (sundry Items)
SANS 1200 HB:	Cladding and Sheeting
SANS 1200 HC:	Corrosion Protection of Structural Steelwork
SANS 1200 L:	Medium Pressure Pipelines
SANS 1200 LB:	Bedding (Pipes)
SANS 719:	Electric welded low carbon steel pipes for aqueous fluids (large bore)
SANS 1217:	Internal and external organic coating protection for buried steel pipelines
ANSI/API 5:	Seamless & Welded Pipe
SANS 0400:	The application of the National Building Regulations

Where no specific reference is made above, the appropriate SABS or SANS specification shall apply.

In general, all electrical work shall comply with the relevant SANS specifications for workmanship and material. Where no SANS specification exists, the applicable BS (British Standards), DIN (German Institute for Standardization) or IEC (International Electrotechnical Commission) specification shall be applicable.

Measurement and payment shall be in accordance with the Preamble to, and the Schedule of Quantities contained in this document.

PORTION 2: VARIATIONS TO STANDARDISED SPECIFICATIONS

In SANS 1200 and SANS 2001 certain clauses of the standard specifications allow a choice to be specified in the project specifications between alternative materials or methods of construction and for additional requirements to be specified to suit a particular contract. Details of such alternative or additional requirements applicable to this contract are contained in this part of the project specifications and are referred to as the **Project Specific Specifications**.

The number of each clause and each payment item in this part of the project specifications consists of the prefix **PS** followed by a number corresponding to the number of the relevant clause or payment item as contained in the standard specifications.

The number of a new clause or payment item, which does not form part of a clause or a payment item in the standard specifications and which is included here, is also prefixed by PS, but followed by a new number which follows on the last clause or item number used in the relevant section of the standard specifications.

PSA GENERAL

PSA 1 SCOPE

Replace the contents of sub-clause 1.1, including the notes, with the following:

"1.1 This specification covers requirements, principles and responsibilities of a general nature which are generally applicable to civil engineering construction and building works contracts, as well as the requirements for the Contractor's establishment on the Site."

PSA 2 INTERPRETATIONS

PSA 2.3 DEFINITIONS

In the opening phrase between the words "specification" *and* "the following", *insert the words* "the definitions given in the Conditions of Contract and".

(a) General

Add the following definitions:

"'General Conditions' and 'Conditions of Contract': The General Conditions of Contract specified for use with this Contract, together with the Particular Conditions as applicable.

'Specified': As specified in the Standardized Specifications, the Drawings or the Project Specifications. 'Specifications' shall have the corresponding meaning."

(c) Measurement and payment

Replace the definitions for "Fixed charge", "Time-related charge" *AND* "Value-related charge" *with the following:*

" 'Fixed charge': A charge that is not subject to adjustment on account of variations in the value of the Contract Price or the time allowed in the Contract for the completion of the work.

'Time-related charge': A charge, the amount of which varies in accordance with the Time for Completion of the Works, adjusted in accordance with the provisions of the Contract.

'Value-related charge': A charge, the amount of which varies pro rata with the final value of the measured work executed and valued in accordance with the provisions of the Contract.' "

PSA 2.4 ABBREVIATIONS

(a) Abbreviations relating to standard documents

Add the following abbreviation:

"CKS: SABS Co-ordinating Specification."

PSA 3 MATERIALS

PSA 3.1 QUALITY

Add the following at the end of sub-clause 3.1:

"All manufactured materials supplied shall be new materials unless specified to the contrary. All materials specified to be in accordance with SABS Specifications shall bear the SABS mark, where such a mark is available for the type of product."

“Should an alternative is offered to be used, the Contractor must obtain the Engineer’s approval in writing else the mark as specified must be used.”

“Wherever samples are required, the samples must be delivered to a point as agreed with the Engineer, in writing. Delivery of such requested samples to the site, if not so instructed, will not be accepted as delivered.”
“The Engineer’s written approval of manufacturer’s published instructions will be required for all material supplied and/or installed.”

PSA 4 PLANT
PSA 4.1 SILENCING OF PLANT

Replace the contents of sub-clause 4.1 with the following:

"The Contractor's attention is drawn to the applicable regulations pertaining to noise and hearing conservation, framed under the occupational health and safety legislation and appropriate regulations.

The Contractor shall at all times and at his own cost, be responsible for implementing all necessary steps to ensure full compliance with such regulations, including but not restricted to the provision and use of suitable and effective silencing devices for pneumatic tools and other plant which would otherwise cause a noise level in excess of that specified in the said regulations.

Where appropriate, the Contractor shall further, by means of temporary barriers, effectively isolate the source of such noise in order to comply with the said regulations."

PSA 4.2 Contractor's offices, stores and services

Add the following paragraph before the existing first paragraph in sub-clause 4.2:

"The Contractor's buildings, sheds and other facilities erected or utilised on the Site for the purposes of the Contract shall be fenced off and shall contain all offices, stores, workshops, testing laboratories, toilet facilities, etc. as may be required by the Contractor. The facilities shall always be kept in a neat and orderly condition.

No personnel may reside on the Site. Only night-watchmen may be on the Site after hours."

Delete "and first-aid services" *in the second paragraph of sub-clause 4.2 and add the following:*

"The Contractor shall provide on the Site and in close proximity to the actual locations where the work is being executed, one toilet per 10 workmen, which toilets shall be effectively screened from public view and their use enforced. Such toilets shall be relocated from time to time as the location of the work being executed changes, so as to ensure that easy access to the toilets is maintained.

The Contractor shall, where applicable, make all necessary arrangements and pay for the removal of night soil."

PSA 5 CONSTRUCTION
PSA 5.1 SURVEY

Replace sub-clause 5.1.1 with the following:

"Survey and setting out shall be carried out by the Contractor in accordance with setting out details provided by the Engineer as on drawings and documents. Such details shall comprise co-ordinated drawings showing positions (X, Y or E, N) that are tied in to the local, system.

The Contractor shall be responsible for the true and proper setting out of the Works and for the correctness of the position, levels, dimensions and alignment of all parts of the Works. The checking of any setting-out or of any line or level by the Engineer shall not relieve the Contractor of his responsibility for the correctness thereof.

Some positions will be set out relative to existing baselines and points. On occasion local conditions may show a better route for services; the Engineer's agreement must be obtained before such changes are implemented.

The Contractor shall advise the Engineer of any conflict between the position of any part of the Works and an existing feature. If there is any doubt the Contractor is to seek clarification from the Engineer before any construction activity commences."

Any reference pegs placed by the Engineer may, of necessity, have to be moved during construction. Pegs that have to be moved must be properly referenced and reinstated.

On completion of the Works the Contractor shall survey (with an RTK GPS system) and make available Record Drawings in geo-referenced AutoCAD format, indicating the location, and design information of the following:

- Bush Clearing of Category 1 and 2 Vegetation
- Semi-Solid Irrigation System
- Infield Roads
- Fencing works

PSA 5.1.2 Preservation and replacement of survey beacons and pegs subject to the Land Survey Act

Delete the words "in the vicinity of boundaries" *in the second sentence of sub-clause 5.1.2 and replace the words* "under the direction of" *in the same sentence with* "in consultation and liaison with".

Add the following after the second sentence of sub-clause 5.1.2:

"The Contractor and the Engineer shall record on the said list, their concurrence or disagreement (as the case may be) regarding the completeness and accuracy of the details recorded therein."

Replace the third sentence of sub-clause 5.1.2 with the following:

"At the completion of the Contract, the Contractor shall expose all pegs that were listed at the commencement of the construction as being in order and the Contractor shall arrange with a registered Land Surveyor for the checking of the positions of all such pegs and the replacement of those that the Land Surveyor's check reveals have become disturbed or damaged. The Contractor shall, as a precedent to the issue of the Certificate of Completion, provide to the Engineer, a certificate from the registered land surveyor, certifying that all the pegs listed at the commencement of construction in accordance with the provisions of this clause, have been checked and that those found to have been disturbed, damaged or destroyed have been replaced in their correct positions, all in accordance with the provisions of the said Act.

The costs of all checking, replacement and certification as aforesaid shall be entirely for the Contractor's account. This, with the provision always that the Contractor shall not be held liable for the cost of replacement of pegs which:

(a) cannot reasonably be re-established in their original positions by reason of the finished dimensions of the permanent works, and

(b) the Contractor can prove beyond reasonable doubt to the satisfaction of the Engineer, were disturbed, damaged or destroyed by others beyond his control."

PSA 5.2 WATCHING, BARRICADING, LIGHTING AND TRAFFIC CROSSINGS

In order to ensure the safety of pedestrians, motorists and workmen where works are to be carried out on public road areas, the Contractor shall comply with the procedures as set out in the latest draft of Road Signs Note No. 13 "Roadworks", as published by the CSRA – CUTA Road Traffic Signs Sub Committee. In particular, the contents of Appendix 4: "Urban Road Sign Sequence" shall be adhered to.

PSA 5.3 PROTECTION OF STRUCTURES

Replace "Machinery and Occupational Safety Act, 1983 (Act No 6 of 1983)" *with* "health and safety legislation of Eswatini, the principles of Construction Regulations, 2014 (South Africa) and international best practice."

PSA 5.4 PROTECTION OF OVERHEAD AND UNDERGROUND SERVICES

Replace the heading and the contents of sub-clause 5.4 with the following:

"PSA 5.4 LOCATION AND PROTECTION OF EXISTING SERVICES

PSA 5.4.1 Location of existing services

Before commencing with any work in an area, the Contractor shall ascertain the presence and actual position of all services which can reasonably be expected by an experienced and competent contractor to be present on, under, over or within the Site.

Without in any way limiting his liability in terms of the Conditions of Contract in relation to damage to property and interference with services, the Contractor shall, in collaboration with the Engineer, obtain the most up-to-date plans as are available, showing the positions of services existing in the area where he intends to work. Neither the Employer nor the Engineer offers any warranty as to the accuracy or completeness of such plans and because services can often not be reliably located from plans, the Contractor shall ascertain the actual location of services depicted on such plans by means of careful inspection of the Site.

Thereafter, the Contractor shall, by the use of appropriate methodologies, carefully expose the services at such positions as are agreed to by the Engineer, for the purposes of verifying the exact location and position of the services. Where the exposure of existing services involves excavation to expose underground services, the further requirements of sub-clauses 4.4 and 5.1.2.2 of SANS 1200 D (as amended) shall apply.

The aforesaid procedure shall also be followed in respect of services not shown on the plans but which may reasonably be anticipated by an experienced Contractor to be present or potentially present on the site.

All services, the positions of which have been determined as aforesaid at the critical points, shall henceforth be designated as 'known services' and their positions shall be indicated by the Contractor on a separate set of drawings, a copy of which shall be furnished to the Engineer without delay.

As soon as any service which has not been identified and located as described above is encountered on, under, over or within the site, it shall henceforth be deemed to be a known service and the aforesaid provisions pertaining to locating, verifying and recording its position on the balance of the site shall apply. The Contractor shall notify the Engineer immediately when any such service is encountered or discovered on the Site.

Whilst he is in possession of the Site, the Contractor shall be liable for all loss of or damage as may occur to

(a) known services, anywhere along the entire lengths of their routes, as may reasonably be deduced from the actual locations at which their positions were verified as aforesaid, due cognizance being taken of such deviations in line and level which may reasonably be anticipated, and

(b) any other service which ought reasonably to have been a known service in accordance with the provisions of this clause.

The Contractor shall also be liable for consequential damage in regard to (a) and (b), whether caused directly by the Contractor's operations or by the lack of proper protection.

No separate payment will be made to the Contractor in respect of his costs of providing, holding available on the Site and utilising the said detecting and testing equipment, nor for any costs incurred in preparing and submitting to the Engineer the Drawings as aforesaid. These costs shall be deemed included in the Contractor's other tendered rates and prices included in the Contract.

Payment to the Contractor in respect of exposing services at the positions agreed by the Engineer and as described above will be made under the payment items (if any) as may be provided for in the respective sections of the specifications pertaining to the type of work involved.

PSA 5.4.2 Protection during construction

The Contractor shall take all reasonable precautions and arrange its operations in such a manner as to prevent damage occurring to all known services during the period which the Contractor has occupation and/or possession of the Site.

Services left exposed shall be suitably protected from damage and in such a manner as will eliminate any danger arising therefrom to the public and/or workmen, all in accordance with the requirements of the prevailing legislation and related regulations.

Unless otherwise instructed by the Engineer, no services shall be left exposed after its exact position has been determined and all excavations carried out for the purpose of exposing underground services shall be promptly backfilled and compacted. In roadways, the requirements of sub-clause 5.9 of SANS 1200 DB should be observed. In other areas compaction is to be to 90% modified AASHTO density.

PSA 5.4.3 Alterations and repairs to existing services

Unless the contrary is clearly specified in the Contract or ordered by the Engineer, the Contractor shall not carry out alterations to existing services. When any such alterations become necessary, the Contractor shall promptly inform the Engineer, who will either make arrangements for such work to be executed by the owner of the service, or instruct the Contractor to make such arrangements himself.

Should damage occur to any existing services, the Contractor shall immediately inform the Engineer, or when this is not possible, the relevant authority, and obtain instructions as to who should carry out repairs. In urgent cases, the Contractor shall take appropriate steps to minimise damage to and interruption of the service. No repairs of telecommunication cables or electric power lines and cables shall be attempted by the Contractor.

A list of important telephone numbers for use when services are damaged or need to be altered is provided below:

Electricity : Eswatini Electricity Company
Contact person: Technical Services Manager
Contact telephone numbers: (00268) 2 409 4103

Water : Eswatini Water Services Corporation
Contact person: Technical Services Director
Contact telephone numbers: (00268) 2 416 3625

Sewerage : Eswatini Water Services Corporation
Contact person: Regional Officer
Contact telephone numbers: (00268) 2 518 4241

Telecom : Eswatini Post and Telecommunications Corporation
Contact person: Lubombo Regional Manager's Office
Contact telephone numbers: (00268) 2 405 2600

Traffic : Royal Eswatini Police Service (Operations Department)
Contact person: Police Post (Big Bend)
Contact telephone numbers: (00268) 2 363 6414

Rail : Eswatini Railway
Contact person: The Director of Engineer
Contact telephone numbers: (00268) 2 404 2486 / 7 / 8

Roads : Ministry of Public Works and Transport: Roads Department
Contact person: The Chief Engineer
Contact telephone numbers: (00268) 2 409 9115

PSA 5.7 SAFETY

Replace the contents of sub-clause 5.7 with the following:

"Pursuant to the provisions of the Conditions of Contract, and without in any way limiting the Contractor's obligations thereunder, the Contractor shall at his own expense (except only where specific provision (if any) is made in the Contract for the reimbursement to the Contractor in respect of particular items), provide the following:

(a) Provide to its Employees on the site of the works, all safety materials, clothing and equipment necessary to ensure full compliance with the provisions of the occupational health and safety legislation and regulations at all times, and shall institute appropriate and effective measures to ensure the proper usage of such safety materials, clothing and equipment at all times;

(b) Provide, install and maintain all barricades, safety signage and other measures to ensure the safety of workmen and all persons in, on and around the site, as well as the general public;

(c) Implement on the site of the works, such procedures and systems and keep all records as may be required to ensure compliance with the requirements of the PSA 5.7(a) at all times;

(d) Implement all necessary measures so as to ensure compliance with the PSA 5.7(a) by all subcontractors engaged by the Contractor and their employees engaged on the works;

(e) Full compliance with all other requirements pertaining to safety as may be specified in the Contract.

The Employer and the Engineer shall be entitled, although not obliged, to make such inspections on the site as they shall deem appropriate, for the purpose of verifying the Contractor's compliance with the requirements of the PSA 5.7(a). For this purpose, the Contractor shall grant full access to the site of all parts of the site and shall co-operate fully in such inspections and shall make available for inspection all such documents and records as the Employer's and/or Engineer's representative may reasonably require.

Where any such investigations reveal, or where it comes to the Engineer's attention that the Contractor is in any way in breach of the requirements of the PSA 5.7(a) or is failing to comply with the provisions of this clause, the Engineer shall, in accordance with the provisions of Sub-Clauses 8.8 to 8.12 of the Conditions of Contract, be entitled to suspend progress on the works or any part thereof until such time as the Contractor has demonstrated to the satisfaction of the Engineer, that such breach has been rectified.

The Contractor shall have no grounds for a claim against the Employer for extension of time and/or additional costs if the progress on the works or any part thereof is suspended by the Engineer in terms of this clause, and the Contractor shall remain fully liable in respect of the payment of penalties for late completion in accordance with the provisions of Sub-Clause 8.7 of the Conditions of Contract should the

Contractor fail to complete the Works on or before the specified due completion date in consequence of the suspension.

Persistent and repeated breach by the Contractor of the requirements of the PSA 5.7(a) and/or this clause shall constitute grounds for the Engineer to act in terms of Sub-Clause 15.2(b) of the Conditions of Contract and for the Employer to cancel the Contract in accordance with the further provisions of the said Clause 15."

Add the following sub-clauses to clause 5:

PSA 5.9 SITE MEETINGS

The Contractor or his authorised agent will be required to attend regular site meetings, which shall normally be held once a month on dates and at times determined by the Engineer, but in any case whenever reasonably required by the Engineer. Unless otherwise indicated in the Contract or instructed by the Engineer, such meetings shall be held at the Contractor's offices on the site. At such monthly meetings, matters such as general progress on the works, quality of work, problems, claims, payments, and safety shall be discussed, but not matters concerning the day-to-day running of the Contract. The Contractor shall be required to submit a monthly progress report to the site meeting, a copy of which shall be delivered to the Resident Engineer not less than 48 hours prior to the scheduled site meeting.

PSA 5.10 WORK ON, OVER, UNDER OR ADJACENT TO A RAILWAY LINE

All work carried out on, over, under or adjacent to a railway line shall be carried out strictly in accordance with the latest edition of Transnet Specification E7, Part 2 or equivalent. The Contractor shall obtain a copy of the latest edition, to be kept on the site, before work of this nature commences.

Attention is drawn to the requirements contained in the Transnet E7 Specification regarding the granting by Eswatini Railway of a work permit or approval for occupation of Eswatini Railway property, as well as the approval of false work and formwork plans."

PSA 6 TOLERANCES

Add the following sub-clause to clause 6:

PSA 6.4 USE OF TOLERANCES

No guarantee is given that the full specified tolerances will be available independently of each other, and the Contractor is cautioned that the liberal or full use of any one or more of the tolerances may deprive him of the full or any use of tolerances relating to other aspects of the work.

Except where the contrary is specified, or when clearly not applicable, all quantities for measurement and payment shall be determined from the 'authorised' dimensions. These are specified dimensions or those shown on the Drawings or, if changed, as finally prescribed by the Engineer, without any allowance for the specified tolerances. Except if otherwise specified, all measurements for determining quantities for payment will be based on the 'authorised' dimensions.

If the work is constructed in accordance with the 'authorised' dimensions plus or minus the tolerances allowed, the calculation of quantities will be based on the 'authorised' dimensions, regardless of the actual dimensions to which the work has been constructed.

When the work is not constructed in accordance with the 'authorised' dimensions plus or minus the tolerances allowed, the Engineer may nevertheless, at his sole discretion, accept the work for payment. In such cases no payment shall be made for quantities of work or material in excess of those calculated for the 'authorised' dimensions, and where the actual dimensions are less than the 'authorised' dimensions minus the tolerance allowed, quantities for payment shall be calculated based on the actual dimensions as constructed."

PSA 7 TESTING

PSA 7.1 PRINCIPLES

PSA 7.2 APPROVED LABORATORIES

Replace the contents of sub-clause 7.2 with the following:

"Unless otherwise specified in the relevant specification or elsewhere in the Project Specification, the following shall be deemed to be approved laboratories in which design work, or testing required in terms of a specification for the purposes of acceptance by the Engineer of the quality of materials used and/or workmanship achieved, may be carried out:

(a) Any testing laboratory certified by the South African National Accreditation Systems (SANAS) in respect of the nature and type of testing to be undertaken for the purposes of the Contract;

(b) Any testing laboratory owned, managed or operated by the Employer or the Engineer;

(c) Any testing laboratory established and operated on the Site by or on behalf of the Employer or the Engineer.

(d) Any other laboratory that the Engineer approves in his absolute discretion."

PSA 8 MEASUREMENT AND PAYMENT

PSA 8.1 MEASUREMENT

PSA 8.1.1 Method of measurement, All Sections of the Schedule

Delete the words "and South West Africa".

PSA 8.1.2 Preliminary and General Item or Section

PSA 8.1.2.1 Contents

Replace the last sentence of sub-clause 8.1.2.1(b) with the following:

"Separate items will be scheduled to cover the fixed, value-related and time-related components of the Contractor's preliminary and general costs."

PSA 8.1.2.2 Tendered sums

Replace the contents of this sub-clause with the following:

"Except only where specific provision is made in the Specifications and/or the Schedule of Quantities for separate compensation for any of these items, the Contractor's tendered sums under items PSA 8.3 and PSA 8.4 shall collectively cover all charges for:

- risks, costs and obligations in terms of the Conditions of Contract and of this standardized specification;
- head-office and site overheads and supervision;

profit and financing costs;

- expenses of a general nature not specifically related to any item or items of the permanent or temporary work;
- providing such facilities on site as may be required by the Contractor for the proper performance of the Contract and for its personnel, including, but without limitation, providing offices, storage facilities, workshops, ablutions, services such as water, electricity, sewage and rubbish disposal, access roads and all other facilities required, as well as for the maintenance and removal on

completion of the works of these facilities and cleaning-up of the site of the Contractor's establishment and reinstatement to not less than its original condition, and

- providing the facilities for the Engineer and his staff as specified in the Contract and their removal from the site on completion of the Contract."

PSA 8.2 PAYMENT

PSA 8.2.1 Fixed-charge and value-related items

Replace the contents of sub-clause 8.2.1 with the following:

"PSA 8.2.1.1 Fixed-charge items

"Payment of fixed charges in respect of item 8.3.1 (Contractual Requirements) will be made as follows:

(a) EIGHTY PER CENT (80%) of the sum tendered will be paid when the facilities have been provided and approved;

(b) The remaining TWENTY PER CENT (20%) will be paid when the works have been completed, the facilities have been removed and the site of the Contractor's establishment has been cleared and cleaned to the satisfaction of the Engineer.

No adjustment will be made to the sum tendered in respect of item 8.3.1 should the value of the works finally executed or the time for completion vary in any way from that specified in the tender.

PSA 8.2.1.2 Value-related items

Payment for the sum tendered under item 8.3.2 (Establishment of Facilities on Site) will be made in three separate instalments as follows:

(a) The first instalment, which is 40% of the sum, will be paid when the Contractor has fulfilled all his obligations to date under this specification, the General Conditions of Contract and the Particular Conditions, and when the value of work certified for payment, excluding materials on site and

payments for preliminary and general items, is equal to not less than 5% of the total value of the work listed in the Schedule of Quantities.

(b) The second instalment, which is 40% of the sum, will be made when the amount certified for payment, including retention moneys but excluding this second instalment, exceeds 50% of the tender sum.

(c) The final payment, which is 20% of the sum, will be made when the works have been certified as completed and the Contractor has fulfilled all his obligations to date under this Specification, the General Conditions of Contract and the Particular Conditions.

Should the value of the measured work finally completed be more or less than the tender sum, the sum tendered under item 8.3.2 will be adjusted up or down in accordance with the provisions of Sub-Clause 12.3 of the Conditions of Contract, and this adjustment will be applied to the third instalment."

PSA 8.2.2 Time-related items

Replace the contents of sub-clause 8.2.2 with the following:

"Subject to the provisions of sub-clauses 8.2.3 and 8.2.4, payment under item 8.4.1 (time-related item) will be made monthly in equal amounts, calculated by dividing the sum tendered for the item by the tendered Contract period in months, provided always that the total of the monthly amounts so paid for the item is not out of proportion to the value of the progress of the Works as a whole."

PSA 8.3 SCHEDULED FIXED-CHARGE AND VALUE-RELATED ITEMS

Replace the contents of sub-clause 8.3.1 with the following:

"PSA 8.3.1 Fixed preliminary and general charges ..... Unit: sum

The sums tendered shall include full compensation for all fixed-charge preliminary and general charges as described in sub-clause PSA 8.1.2.2. Payment will be made as described in sub-clause PSA 8.2.1.1.

VERIFIED ESPPRA CERTIFIED

PSA 8.3.2 Value-related preliminary and general charges .....Unit: sum

The sums tendered shall include full compensation for all value-related preliminary and general charges as described in sub-clause PSA 8.1.2.2. Payment will be made as described in sub-clause PSA 8.2.1.2."

PSA 8.4 SCHEDULED TIME-RELATED ITEMS

Replace the contents of sub-clause 8.4 with the following:

"PSA 8.4.1 Time-related preliminary and general charges ..... Unit: sum

The sum tendered shall include full compensation for all time-related preliminary and general charges as described in sub-clause PSA 8.1.2.2. Payment will be made as described in sub-clause PSA 8.2.2."

PSA 8.5 SUMS STATED PROVISIONALLY BY THE ENGINEER

Replace the contents of sub-clause 8.5 with the following:

"**PSA 8.5.1 Works executed by the Contractor** Unit: Prov sum

The Contractor will be reimbursed in substitution of the Provisional Sums (if any) allowed in the Schedule of Quantities for work to be executed by the Contractor, in the amounts determined in accordance with the provisions of Sub-Clause 13.5 of the Conditions of Contract.

PSA 8.5.2 Works executed by Nominated Subcontractors:

(a) Work to be executed by a Nominated Subcontractor ..... Unit: Prov sum

(b) Overheads, charges and profit on item (a) above ..... Unit: % or sum

Sub-items (a) and (b) will be provided in the Schedule of Quantities for each different Nominated Subcontract included in the Contract.

The Contractor shall be reimbursed under sub-item (a), in substitution of the respective Provisional Sums (if any) allowed in the Schedule of Quantities, the amounts actually paid or payable by the Contractor to the respective Nominated Subcontractors, in accordance with the provisions of Sub-Clause 13.5 of the Conditions of Contract.

The Contractor shall be paid under sub-item (b), either:

(a) where the unit of measurement for sub-item (b) was specified as being a percentage, the respective percentage, as stated by the Contractor in is tender, of the amount certified by the Engineer for payment under the related sub-item (a), all in accordance with the provisions of Sub-Clause 13.5(b)(ii) of the Conditions of Contract.

(b) provided always that where the Contractor has failed for any reason to insert a percentage (as applicable) for sub-item (b) in its tender, or where no provision was made in the tender documents for tenderers to make any such entry, the Contractor will be paid an amount equal to SEVEN AND ONE HALF PER CENT (7,5%) of the amount actually certified by the Engineer for payment under sub-item (a).

The percentage paid under sub-item (b) as aforesaid, shall be deemed to include for full and final compensation to the Contractor for all costs as may be incurred and all charges and profits associated with the engagement, supervision, administration and management of the Nominated Subcontractor required of him in fulfilling its obligations under the Contract as the Principal Contractor."

PSA 8.6 PRIME COST ITEMS

Replace sub-clause 8.6 with the following:

"PSA 8.6 PRIME COST SUMS

(a) Description of item to which Prime Cost Sum applies ..... Unit: PC sum

(b) Charge required by Contractor on sub-item (a) above ..... Unit: %

Sub-items (a) and (b) will be provided in the Schedule of Quantities for each different item to which a Prime Cost Sum applies.

The Contractor shall be reimbursed under sub-item(s) (a) in substitution of the respective Prime Cost Sums included in the Contract, the actual price(s) paid or payable by him in respect of the goods, materials or services supplied, but excluding any charges for the Contractor's labour, profit, carriage, establishment or other charges related to such goods, services or materials.

The Contractor shall be paid under sub-item (b), the respective percentage, as stated by the Contractor in his tender, of the amount certified by the Engineer for payment under the related sub-item (a). The percentages tendered by the Contractor for each respective sub-item (b) included in the Schedule of Quantities shall be deemed to be in full and final compensation to the Contractor in respect of any charge by the Contractor for labour, carriage profit, establishment and for any other charges related to the goods, services or materials supplied under the related sub-item (a).

If the Contractor shall have omitted within his tender to insert a tendered percentage under sub-item (b), or tendered a zero percentage, the Contractor's tendered rate for sub-item (b) shall be deemed to be zero and the Contractor shall not be entitled to any payment under sub-item (b).

Note in connection with additional tests required by the Engineer:
When a PC sum is included in the Schedule of Quantities for additional tests required by the Engineer, the Contractor shall be responsible for both the cost of normal testing as described in Clause A3 of Section 1.1 General and for the cost of any additional test that indicates that the specifications have not been complied with."

PSA 8.7 DAYWORK

Replace the contents of sub-clause 8.7 with the following:

"Measurement and payment shall be in accordance with the provisions of Sub-Clause 13.6 of the Conditions of Contract."

Add the following items:

PSA 8.9 WAYLEAVE .....Unit: sum

The tendered sum shall include full compensation to the Contractor for all the costs involved in adhering to the wayleave requirements.

PSA 8.10 COMPLIANCE WITH HEALTH AND SAFETY LEGISLATION AND REGULATIONS .....Unit: sum

The tendered sum shall include full compensation to the Contractor for compliance with all the requirements of the health and safety legislation and regulations at all times for the full duration of the Contract. The successful tenderer shall provide the Engineer with a complete breakdown of this tendered sum.

This sum will be paid to the Contractor in equal monthly amounts subject to proper/substantial compliance."

PSA 8.11 MOTOR VEHICLES

(a) Provision of motor vehicles

(type of vehicle to be specified) …….Unit: number

(b) Kilometres travelled by motor vehicles

(type of vehicle to be specified) …….Unit: kilometre (km)

The unit of measurement for item PSA(a) shall be the number of vehicles (type of vehicle specified) complete as specified which are provided on the Engineer's instructions.

The unit of measurement for item PSA(b) shall be the number of kilometres run in each type of vehicle supplied on the Engineer's instructions".

Motor vehicles of the type specified hereunder and the quantity stated in the Bill of Quantities shall be supplied, serviced and maintained in good running order by the Contractor for the full period of the Contract. The specified vehicles shall, during the Contract period, at all times be made available to the Engineer's supervisory staff and, during breakdowns and servicing periods, equivalent alternative vehicles shall be provided at no extra cost.

The Contractor shall supply fuel for the vehicles and maintain a convenient fuelling point within the main camp to which the Engineer's supervisory staff shall be given reasonable access for the purpose of refuelling vehicles supplied to the Engineer by the Contractor under the Contract.

Vehicles may be driven by the Engineer's supervisory staff or any of the Engineer's drivers or other personnel authorised to do so and the Contractor shall provide sufficient insurance cover to allow for vehicles to be driven by more than one person.

All vehicles shall be approved by the Engineer prior to supply. They should all be of a light colour, fitted with steel belt radial tyres, alarms and immobilisers. All vehicles shall be air-conditioned and be fitted with radio/cassettes. The vehicles shall be covered by full comprehensive insurance and registered for immediate use. All vehicles are to be purchased new at the commencement of the Project unless otherwise approved by the Engineer. All vehicles are to be fitted with two-way radios in accordance with clause 1405 and long-range fuel tanks are to be fitted to all double cab vehicles.

In addition each vehicle shall be fitted with a fire extinguisher, AA Delux first-aid kit, tow hook and rope, tool kit, spare wheel, wheel wrench, jack and handle and seat belts.

The Contractor shall provide replacement for any vehicle by a similar new vehicle after it has completed 100 000 km if, in the opinion of the Engineer, such vehicle cannot be maintained in a satisfactory condition.

The vehicle to be provided is a four door, four wheel drive, twin cab with air conditioning, power steering, a secure canopy and a minimum 2.4 litre diesel engine.

Note:

The vehicle will remain the property of the Employer and/or Ministry of Agriculture – Department of Land Use Planning and Development on completion of the Works.

PSAB ENGINEER'S OFFICE

PSAB 3 MATERIALS

PSAB 3.1 NAMEBOARDS

Replace the first sentence of sub-clause 3.1 of SANS 1200 AB with the following:

"The Contractor shall supply and erect at locations approved by the Engineer, the number of contract name-boards which, unless otherwise specified in the Contract, shall comply with the recommendations for the standard board of the South African Association of Consulting Engineers with regard to size, painting, decorating and detail, and the requirements described hereunder."

PSAB 3.2 OFFICE BUILDING(S)

Rreplace sub-clause 3.2(j) of SANS 1200 *AB with the following:*

"(j) a heater and fan or air-conditioning unit capable of both heating in winter and cooling in summer."

(k) a small fridge with a minimum capacity of 90 ℓ

Add the following sub-clauses to clause 3:

"PSAB 3.3 CARPORT
The Contractor shall construct the number of carports specified in Section 1: Scope of Work and the bill of quantities, for the sole use of the Engineer and his staff. Each carport shall be constructed so that the vehicle parked under it is always protected against the direct rays of the sun. The carport area shall be at least 20 m² and the floor shall be covered with a layer of crushed stone to alleviate dusty and **muddy** conditions. The carport(s) shall be positioned so as to provide easy and convenient access to the Engineer's office."

PSAB 4 PLANT
PSAB 4.1 TELEPHONE

Replace sub-clause 4.1 of SANS 1200 AB with the following:

Subject to satisfactory transmission and reception quality in the vicinity of the Site, the Contractor shall provide the number of cellular telephones and associated service contracts from a reputable cellular service provider as specified in Section 1: Scope of Work, for the exclusive use of the Engineer and his staff. The Contractor shall further insure the cellular telephones against loss or damage from whatever cause, and shall ensure that all cellular telephone accounts are promptly paid on the due dates for payment. The Contractor shall further, at his own cost, ensure the prompt repair of all cellular telephones provided under this clause, when reasonably required by the Engineer."

Add the following new sub-clauses to clause 4 of SANS 1200 AB:

PSAB 4.2 SURVEY EQUIPMENT

The Contractor shall provide on-site and make available for the exclusive use of the Engineer and his staff, the survey equipment listed in Section 1: Scope of Work.

All survey equipment provided by the Contractor shall be in good condition, properly calibrated and fit for the purpose.

In addition to survey equipment provided by the Contractor for the exclusive use of the Engineer and his staff, the Contractor shall make available for use by the Engineer, the further survey equipment listed in Section 1: Scope of Work, at all times when such is reasonably required by the Engineer and his staff for the purposes of the Contract.

PSAB 5 CONSTRUCTION

PSAB 5.4 TELEPHONE

Replace the contents of sub-clause 5.4 of SANS 1200 AB with the following:

PSAB 5.4.1 Cellular Telephone

The Contractor shall advise the cellular service provider of any faults which develop in the cellular telephone service and/or the cellular telephone handsets and shall, in such circumstances, arrange for the earliest possible restoration of the said service.

The costs of any necessary repairs and/or the replacement of components to the handsets of the cellular telephones shall be for the Contractor's account.

The Contractor shall ensure that all accounts for cellular telephone calls and the respective service contracts are promptly paid.

Add the following new sub-clauses to clause 5 of SANS 1200 AB:

PSAB 5.5 SURVEY EQUIPMENT

All survey equipment provided by the Contractor shall be kept fully serviceable at all times by the Contractor. The Contractor shall have any defective equipment repaired or replaced at his own cost within 12 hours after notification by the Engineer's staff.

Where required by the Engineer, the Contractor shall, at his own cost, promptly arrange for the recalibration of survey equipment provided."

SANS 1200C MEASUREMENT AND PAYMENT (CLAUSE 8)
PS C 1.0 SITE CLEARANCE (SANS 1200C)
Replace the first line with the following:

"The area designated by the Engineer to be cleared and grubbed will be measured in square metre to the nearest square metre or,"

Add the following items in sub clause 8.2:

PSC 8.2.12 Remove topsoil to spoil site furnished by Contractor..... Unit: m³

The tendered rate shall include full compensation for removing topsoil over 1.5m wide strip to a depth of 150 mm and for loading and transporting the material to spoil sites furnished by the Contractor."

PS DB EARTHWORKS (PIPE TRENCHES) (SANS 1200 DB)

Clauses referred to in this Clause PSD refer to SANS 1200 DB.

PS DB1 MATERIALS (CLAUSE 3)

PS DB1.1 CLASSES OF EXCAVATION

Replace sub-clause 3.1 with the following

"The excavation of material will, for purposes of measurement and payment be classified as specified below.

3.1 a) Normal material

Normal material is all material other than rock. No additional allowance above the Contractor's tendered unit price will be made on account of materials being wet.

3.1 b) Hard or Rock

Hard material is material which cannot be excavated without blasting or using means such as wedging and splitting. Hard shall be taken to mean solid, unweathered crystalline rock, which can only be removed by blasting, wedging or other quarrying methods.

Hard shall also include slightly weathered rock which cannot be excavated by ripping using a Bulldozer with a flywheel power of 160 kW or a back hoe tractor with a flywheel power of 100 kW or which, in the opinion of the Engineer, requires shattering by the use of explosives before it can be excavated by common excavating equipment.

Whether material is hard needs to be agreed with the Engineer prior to excavation.

3.1 c) Boulders

Boulder excavation as defined in SANS 1200 D Sub-Clause 3.1.2 (d) & (e) will not apply to the classification of materials for excavations. With the exception that boulders with a volume of greater than one (1) cubic meter shall be classified as hard.

PS DB2 PLANT (CLAUSE 4)

PS DB2.1 EXCAVATION EQUIPMENT (SUB-CLAUSE 4.1)

The contractor's attention is drawn to sub-clause 4.1 of this document in relation to the selection of trenching equipment.

PS DB2.2 CONTROL OF WATER (SUB-CLAUSE 4.2)

Add to sub-clause 4.2 the following

"The contractor is to be prepared to cater for water in trenches, the rate for which is to be inclusive of the excavation rate."

PS DB3 CONSTRUCTION (CLAUSE 5)

PS DB3.1 MINIMUM BASE WIDTHS (SUB-CLAUSE 5.2)

Amend sub-clause 5.2 with the following

"The width of all trenches for PVC pipes shall be a minimum of the pipe diameter plus 500 mm (i.e. 250 mm each side) for diameters less than Ø315 mm or 600 mm (i.e. 300 mm each side) for equal and larger diameters.

The width of buried cable trenches shall be 300 mm minimum. The width of all trenches shall be as narrow as possible within the above constraints. Bedding quantities, where necessary, will be calculated according to these trench widths.

Where multiple pipes are located in the same trench the width will be the sum of the diameters, with 250 mm clearance between pipes and 250 mm space at the trench wall.

Small diameter pipes (defined here as less than Ø63 mm) for irrigation laterals may be inserted in trenches excavated by a narrow "ditch-witch" or via a purpose made insertion machine. There are no minimum base widths for such excavation, however, the rate must include for additional excavation where required to install fittings, thrust blocks, chamber etc."

PS DB4 EXCAVATION (SUB-CLAUSE 5.4)

Add to *sub-clause* 5.4 the following:

"Trench depths for all underground pipes and cables shall allow a minimum of 700 mm cover below natural ground level or as specified on the drawings for particular sections. Buried mainlines shall have a minimum cover of 1000 mm, and shall be positioned below any sub-mains or laterals found to be in close proximity, with a minimum vertical clearance of 150 mm.

In general, drainage channels shall be crossed by deepening the approaching trenches such that the pipe will be buried by 500 mm below the drain invert, unless a specific design is indicated on the drawings.

The contractor shall excavate trenches progressively and shall not be permitted to pass over hard or difficult sections of the excavation to proceed with soft or easier sections further along the trench. This clause may only be relaxed at the discretion of the Employer.

Excavations of pipe trenches shall not proceed more than 3 days ahead of pipe

Over excavation in all materials is for the contractors account. Should the contractor excavate a trench to a width greater than the maximum specified, or should the contractor carry any excavation to a greater depth than specified, he shall at his own expense replace the excess material so removed, with whatever method the Engineer deems necessary.

Where cable is laid in the same trench as pipes, the cable shall be laid 400mm to the left of the pipeline wall when viewed from the pump station (i.e. in the direction of flow). Danger tape shall be laid not more than 300mm and not less than 100mm above the cable. All cable joints should be accurately surveyed (within +-100mm) and the position noted for inclusion in the O&M manuals in order to enable ease of finding them in the future."

PS DB5 BACKFILLING (SUB-CLAUSE 5.6)

PS DB5.1 GENERAL (SUB-CLAUSE 5.6.1)

Add the following to sub-clause 5.6.1

"Bedding shall be as specified in section PS LB below and in its absence SANS 1200 LB.

Selected backfill shall be placed and compacted to 300mm below the pipe to a minimum of 300 mm above the crown of the pipe. Thereafter the excavated material can be backfilled (including rock or lumps of hard material up to 50mm in diameter) with light compaction.

Road crossings shall be backfilled with selected granular or gravel material and well compacted to ground level. As for storm damage the contractor will be responsible for maintaining the road crossings until the end of the maintenance period and should pay particular attention to this aspect of the work.

Bedding and backfilling for lateral irrigation pipes that are installed via mechanical insertion or in narrow trenches excavated by "ditch-witch" of diameter less than or equal to Ø63 mm may be in-situ material."

PS DB5.2 COMPLETION OF BACKFILLING

Add the following to sub-clause 5.6.6

"Backfilling around pipes shall not be allowed to fall more than 250 metres behind pipe laying.

The contractor may use his discretion as to whether to backfill around joints before the pipeline is hydraulically tested. Should the contractor decide to backfill the joints, he shall be responsible for the location of any leaks. No extra payment shall be made for any re-excavation and subsequent reinstatement.

No excess material from excavations or material used to provide access or protection may be left in the riverbed, ditches, canals or roads. The Contractor must make allowance for the carting away and spoiling of such material."

PS DB5.3 SETTING OUT AND ALIGNMNET (NEW SUB-CLAUSE 5.11)

Add new sub-clause 5.11 to clause 5

"The contractor is responsible for setting out the pipelines on site from the detail drawings provided by the Engineer. The location is not always precise and is frequently defined by irrigated lands or irregular homestead boundaries. It is nevertheless required that the pipeline be constructed in accordance with good practice in a manner that will not compromise its operation (e.g. through air entrainment) and will facilitate its maintenance. The setting out will therefore comply with the following requirements:

a) Horizontal

The pipe is to be laid in straight lines between bends or on predetermined geometric curves but it shall not meander. This is to assist with the location of the buried pipe from "as built" plans at a later date.

b) Vertical

The trench shall be evenly graded to avoid local high and low points as far as is reasonable in order to facilitate the release of air."

PS DB6 MEASUREMENT AND PAYMENT (CLAUSE 8)

PS DB6.1 BASIC PRINCIPLES (SUB-CLAUSE 8.1)

Add to sub-clause 8.1.1

"Excavation of trenches shall also include for the provision of suitable bedding (selected granular material) from the trench, selected fill material and main fill and the placing and compaction to 90% MOD AASHTO of all material. The rates tendered for pipe excavations must cater for any extra excavation necessary of specials, fittings, thrust blocks and all other equipment. In depth categories where shoring or protection is required, the cost for this must be included in the rate.

Measurement will be in linear metres for set trench widths and depths as shown in the Bill of Quantities.

Dealing with water must be included in the rate. Care must be exercised to ensure that trenches are backfilled soon after the installation of pipes to avoid floating.

Allowance is made for overhaul, as stated in the Bills of Quantities.

PS DB6.2 COMPUTATION OF QUANTITIES (SUB-CLAUSE 8.2)

Replace sub-clause 8.2.2

"The length used for computation will be the total through length (in linear metres) for each trench width category, without deduction for valves, manholes, catch-pits, valve boxes and the like. "

PS DB6.3 SCHEDULED ITEMS (SUB-CLAUSE 8.3)

Delete sub-clause 8.3

Note: Payment for excavations is inclusive within the Scheduled Items provided within Section PS-L below. (See PS L5)

PS L PIPEWORK: MEDIUM PRESSURE PIPELINES (SANS 1200 L)

Clauses referred to in this clause PS L refer to SANS 1200 L.

PS L1 MATERIALS (CLAUSE 3)

PS L1.1 STEEL PIPES, FITTINGS AND SPECIALS (SUB_CLAUSE 3.4)

Add to sub-clause 3.4.1 the following

"All steel pipes, pipe specials and fabricated fittings shall comply with the requirements of SANS 719 and Butt weld fittings to ANSI B16.9 and BS 1640, or JIS 2404-72 or SANS 62 and galvanised as required to SANS 121 (ISO 1461:2009) or SANS 32 (EN 10240:1997) where applicable. Mild steel piping shall be fabricated and assembled in the workshop.

In addition:

a) Pipes are to be supplied to the lengths and nominal diameters provided.
b) Grade 300WA steel to be used in the manufacture of the pipes and fittings.
c) All fittings with Diameter greater than 500 mm are to be manufactured to the AWWA standard, Dimensions for Fabricated Steel Water Pipe Fittings. Where dimensions shown on drawings differ from the AWWA standard, the Engineer is to be informed. In the case of bends, all radii are to be 1.5 x ND, unless specified differently on the drawing.

Prefabricated piping sections shall be capable of being fitted into place without springing or forcing. Loose flanges and cutting lengths shall be supplied at the discretion of the pipework contractor, to allow for minor alignment errors or plant location. Pressure rating of the loose flanges and gasket set shall be similar to the pipe. All pipelines shall be cleaned internally.

All flange boltholes shall be spaced equally off centre, unless specified otherwise on arrangement drawings. Thread tape shall be used on all threaded fittings."

PS L1.2 OTHER TYPES OF PIPES (CLAUSE 3.7)

PS L1.2.1 UPVC PIPES (SUB-CLAUSE 3.7.1)

Add to sub-clause 3.7.1 the following:

"The unplasticised polyvinyl chloride (uPVC) piping system shall conform to SABS/SANS 966 Part 1. Unplasticised polyvinyl chloride (uPVC) piping system shall conform to SABS 966 Part 1 or ISO 4422. Modified polyvinyl chloride (mPVC) piping shall comply with SABS 966 Part 2. In all cases, pipe internal diameters shall be no less than the equivalent mPVC pipe.

All PVC fittings except for saddles shall be either injection moulded plastic (FIP or similar), uPVC (minimum Class 9), ductile iron (DI) or cast iron fittings capable of withstanding working pressures of at least 900 kPa. All uPVC bends shall be long radius bends.

All saddles for uPVC piping shall be polypropylene or injection moulded plastic (FIP or similar) and shall be complete with stainless steel bolts. All hose clamps and screws shall be stainless steel. Saddles shall be minimum four bolt where possible.

All uPVC reducers shall either be injection moulded plastic (FIP or similar), uPVC (minimum Class 9), or galvanised manufactured specials capable of withstanding the working pressures.

If injection moulded plastic reducing bushes are used, the contractor must supply a double socket to fit over the big end.

If fabricated PVC reducers are used the contractor must supply a double socket to the spigot end.

For large diameters where there are no standard fittings as described above, fittings shall be manufactured from cast iron as per SANS 1200 L Clause 3.3 or steel as per specifications in this contract.

Either spigot and socket rubber ring joints or PVC solvent cement fittings are to be used in accordance with the manufacturer's specifications and in accordance with relevant ISO international standards. Solvent weld will only be approved for nominal diameters up to 160 mm.

Prior to installation, all piping is to be visually checked for non-conformance, with visually defective pipe being rejected. During installation, where there is insufficient chamfer on the end of the pipe this is to be remedied according to the manufacturer's recommendations.

Bending:
An important feature of PVC pipes is that they may be deliberately bent, within limits, thus eliminating the need, in some cases, for separate bends. The radius of such a bend must not be less than 300 times the pipe diameter. In addition, each rubber ring joint can accommodate a further ½° of bend. "

PS L1.2.2 POLYETHYLENE PIPES (SUB-CLAUSE 3.7.2)

Add to sub clause 3.7.2:

"HDPE
High Density Polyethylene (HDPE) pipes are to be manufactured to SANS 4427. Only material grades PE100 manufactured from virgin material will be accepted.

LDPE
Low Density Polyethylene (LDPE) pipes are to be manufactured to SANS or ISO 8779:2010, latest editions. Only pipes manufactured with virgin material will be accepted. LDPE piping is to be guaranteed for a minimum of 5 years.

Note that nominal bores and pipe diameters specified shall be supplied accordingly, with no alterations. "

PS L1.3 JOINTING MATERIALS (CLAUSE 3.8)

PS L1.3.1 FLEXIBLE COUPLING (SUB-CLAUSE 3.8.2)

"Flexible couplings for cast iron pipes and, where specified, for asbestos cement pipes, shall be of the cast iron short or long collar type. Flexible couplings for steel or stainless-steel piping shall normally be of the "Victaulic" type or approved equal for grooved or shouldered end pipes.

Where more movement variation must be allowed for than is permitted by the above specified couplings, or if necessary, for any other reason, Viking Johnson couplings and flange adaptors, or equivalent, may be used if approved by the Engineer. These couplings shall be supplied without centre register unless otherwise specified.

Couplings for plastic pipes shall be of the fabricated pressure fittings type."

PS L1.3.2 FLANGES AND ACCESSORIES (SUB-CLAUSE 3.8.3)

Add to sub-clause 3.8.3 the following:

"All standard flanges shall comply with SANS 1123:2007. For flange sizes not included in the SABS, BS 4504 shall be used. Cast iron flanges and their mating flanges shall have flat faces. The flange table shall be as specified or, if not specified, selected to suit the maximum possible operating pressure. Drilling and installation of flanges shall be "off centre".

It shall be the responsibility of the Contractor to ensure that the flanges on pumps, valves, fittings, specials and pipes, which shall be fitted together, are fully compatible. Before supply, the supplier must receive confirmation of the flange drilling required to ensure that pumps, valves etc. are properly suited. The flanges shall be drilled to the relevant table or to match existing flange drillings if applicable.

Where described as "half V-J coupling" in drawings, specifications or the Bill of Quantities, this refers to a special that has a half VJ coupling attached that will fit on to the adjacent pipe. The supplier may alternatively supply a full VJ coupling suitable for joining the special to the adjacent pipe, both being plain ended.

Flanges 50 mm NB and below may be of the screwed-on type. Above 50 mm metal flanges shall be welded on in accordance with BS 806 Type 6 unless otherwise agreed or specified.

Flange Machining:
All flanges shall be machined on the sealing face. Flanges cut from plate shall also be machined on the bore and outside diameter. Cast iron flanges shall also be machined or spot faced on the back of the flange to ensure a flat bearing surface for the fastener's head or nut and washer. All edges, including bolt-holes, shall be chamfered or rounded to a 2 mm radius.

Before the machined surfaces have become affected by rust, they shall be coated with a mixture of white lead and tallow or other approved protective composition.

Flange Jointing Material:
All flange jointing material shall be approved by the Engineer before erection is commenced. Insertions for flat flange faces shall be of the full flange diameter encompassing the bolts. Insertion for raised flanges and when clamping items such as wafer type valves are used shall fit neatly inside the bolt rights.

All packing's must be cut from rubber insertions (for pipe diameters 300 mm and smaller) with a nominal thickness of 3,2 mm according to SABS 564-1973. The inside and outside diameters should be according to SABS 1123-1977. For pipe diameters exceeding 300 mm Klingerrite gaskets should be used to the applicable specifications.

Pipe Ends:
Pipe ends shall be prepared strictly in accordance with the coupling manufacturer's recommendations. Where machining is required, as in the case of cast iron pipes, the length of machining on each pipe shall be approximately equal to the total length of the coupling to ensure that the coupling can be separated for pipe removal."

PS L1.4 CORROSION PROTECTION (CLAUSE 3.9)

PS L1.4.1 STEEL PIPES (SUB-CLAUSE 3.9.2)

Add to sub-clause 3.9.2:

"All galvanising shall be done in accordance with SANS 121 (ISO 1461:2009) and SANS 32 (EN 10240:1997), Hot Dip Galvanizing specification for products other than continuously galvanized sheet and wire. The minimum amount of zinc deposited shall be 760 g/m².

Site Repairs

Modifications, transportation and erection damage, shall be repaired by abrading with 80 grit sand paper and painting with Galvpatch or equal and approved twin pack zinc rich epoxy

paint, achieving an overlap of 5 mm onto the surrounding sound zinc coating and to a minimum thickness of 100 µm.

When a duplex coating system has been specified, the DFT of the repair coating shall be equal to that of the surrounding coating. Steel shall not be accepted until the repaired surface has cured. Furthermore, in priority and as approved by the Engineer; uncoated steel utilised in modifications with hot dip galvanised steel shall be despatched for hot dip galvanising. Any areas that are to be subsequently welded should either be masked prior to hot dip galvanising or suitably cleaned of zinc in order to prevent possible weld metal embrittlement or zinc residue inclusions, prior to welding on site. Where site modifications of a hot dip galvanised surface are required, all traces of the hot dip galvanised coating shall be ground off prior to welding. Removal of the zinc coating from surfaces to be welded is necessary in order to prevent possible weld metal embrittlement or zinc residue inclusions.

Coatings at joints and coatings that have been repaired shall be tested in the same manner as the first applied coatings over 100% of the area and shall in every way be to the satisfaction of the Engineer."

PS L1.4.2 STEEL PIPES OF NOMINAL BORE UP TO 150 MM

Replace sub-clause 3.9.2.1 with:

"All steel pipe material of and up to 150 mm diameter should be hot dipped galvanised. All below ground steel piping and fittings shall be painted with an approved bitumen coating over the primer."

PS L1.4.3 STEEL PIPES OF NOMINAL BORE OVER 150 MM

Replace sub-clause 3.9.2.2 with:

"Internal Protection and External Protection:

Exposed galvanised piping is to be primed with a self-etching primer, and painted with one coat of metal primer, one undercoat and a topcoat of polyurethane paint all in accordance with the manufacturer's recommendation. Each layer of paint is to be of a different colour.

Where epoxy coated and lined mild steel pipes are detailed or scheduled, the following shall apply:

a) Both the lining and coating are to be epoxy based and applied strictly in accordance with SANS 1217. The following liquid epoxy linings are approved, Sigma line 523, Carboline 891, Denso ST100 or similar with the approval of the Engineer. Only solvent free epoxies which have been certified non-toxic and non-tainting and suitable for use with potable water will be permitted. Should the supplier wish to offer an alternative product it will be necessary to obtain the approval of the Engineer.
b) Epoxy coating dry film thickness is to be a minimum of 406 microns and a maximum of 1 000 microns and to be free of sags and runs.
c) Epoxy lining dry film thickness is to be a minimum of 300 microns and a maximum of 500 microns and to be free of runs and sags
d) All pipes coated with liquid epoxy shall be over coated with three or more coats of a light coloured opaque acrylic paint to a total minimum dry film thickness of 50 microns for UV protection.
e) Coating on pipes that are to be field welded shall be stopped 100 mm from the end. On pipes that are to be coupled or flanged the coating shall be continued to the end, and around the end or over the flange. Repairs and making good of damaged areas shall be effected using a suitable repair, solventless epoxy composition (Plascon ERPI or equivalent) which shall be applied after the area to be repaired has been thoroughly abraded with 220 grit abrasive paper.

Before application of epoxy coating:

f) Welds shall be ground down to give a maximum protrusion of 1 mm.
g) Sharp edges around pipe ends shall be rounded off to a 3 mm radius.

The supplier is to supply sufficient materials of the coating specified to coat and repair the weld cut back areas once the pipe has been welded. In addition, the supplier is to include materials to repair damage during transport and installation.

The term “coating” shall, where applicable, include lining.

Buried Steel Pipe regardless of coating type are to be bitumen wrapped.

All bolt threads shall be liberally coated with "Copper slip" or similar approved prior to assembly. Upon completion, bolt heads and nuts shall be wrapped with the "Denso Mastic Blanket System" comprising of a priming solution, mastic blanket, petrolatum tape and lay-flat sheeting."

PS L1.5 BOLTS AND NUTS (NEW CLAUSE 3.12)

Add new sub-clause 3.12 to clause 3

"All nuts, bolts, studs and washers shall comply with SABS 135:1985 and shall be hot dipped galvanised according to ISO 1461.

No bolts or studs of less than the size indicated on the drawings shall be used. The length of each bolt shall be such that after tightening between one thread and one diameter in length projects through the nut and at least one full thread in addition to the thread run-out remains clear between the nut and the unthreaded shank. The threaded portion of bolts shall be clear of the shear plane. All nuts and studs shall be locked in position by lock-washers and where necessary, locknuts. High tensile bolts and nuts should be used to couple the flexible hoses to limit the rust-effect on these very important elements when the pump units have to be moved."

PS L1.6 ECCENTRIC AND CONCENTRIC REDUCERS (NEW CLAUSE 3.13)

Add new sub-clause 3.13 to clause 3

"All eccentric and concentric reducers lengths must be (D1 – D2) x 5."

PS L2 CONSTRUCTION (CLAUSE 5)

PS L2.1 THRUST AND ANCHOR BLOCKS (SUB-CLAUSE 5.5)

Add the following to sub-clause 5.5

"All bends, tees, riser tees, elbows, reducers and end caps require thrust and anchor blocks. If there is any doubt regarding the suitability of the in-situ material at any location, the Contractor shall obtain a ruling from the Engineer prior to casting the thrust blocks. The thrust blocks designs assume soil bearing capacity of 100 kN/m2.

Pipe work using flexible couplings shall be supported and anchored strictly in accordance with the coupling manufacturer's recommendations. Harnesses against separating forces shall be provided where appropriate to the approval of the Engineer. Where this restraint is not provided by the layout, other neat and positive means of harnessing shall be provided. A system incorporating additional flanges or lugs cast on in the case of cast iron, or welded on for steel, and connected by tie bars or positively fixed to anchors, will be accepted. Systems relying purely on friction will not be acceptable.

Supports

No external loads shall be placed on items of mechanical equipment such as pumps, compressors, etc. Adequate provision shall be made for expansion and contraction due to variations in temperature or pressure.

Pipe supports shall be so located that when an item of mechanical equipment is removed, the associated valves and pipe work are still adequately supported. Supports shall be provided close to heavy items such as valves.

3 mm thick neoprene strips shall be placed between pipes and supports or clamps to protect the paintwork and limit corrosion. Where roller or sliding supports are used to accommodate movement, suitable wear blocks shall be fixed to the pipe to prevent damage.

PS L3 TOLERANCES (CLAUSE 6)

Add to clause 6

a) Nominal Size and Outside Diameter shall comply with Clause 4.1.2 of SABS 719.
b) The wall thickness of the pipe shall be subjected to a tolerance of -3.5% and +10% of the nominal wall thickness specified.
c) Pipe straightness shall comply with SABS 719 Clause 4.14.
d) Pipe length shall have a tolerance of +50 and -0 millimetres
e) Tolerances on epoxy linings and coatings +100 microns and -0 microns

PS L4 TESTING (CLAUSE 7)

The contractor's attention is drawn to sub-clause 7.3 of this document in relation to the standard hydraulic pipe test.

PS L5 MEASUREMENT AND PAYMENT (CLAUSE 8)

PS L5.1 GENERAL (SUB-CLAUSE 8.1)

Amend clause 8.1 with the following

"The rates tendered for the various items scheduled shall be all inclusive and shall cover all costs, overheads and contractor's profit for completing the work envisaged by the contract including, but not limited to, the costs of complying with the requirements set out in these specifications. No claims for extra payment will be entertained for work which, although not specifically scheduled, is nevertheless required to complete the project envisaged by the contract and would have been foreseen by an experienced contractor."

PS L5.2 SCHEDULED ITEMS (SUB-CLAUSE 8.2)

Replace sub-clause 8.2 with:

"8.2.1 Supply, deliver, excavate, bed and backfill, install including anchors and restraints, test, commission and attend to defects during the period of warranty.

Unit - m

Note: Pipelines will be measured by length over all lengths as laid. No deductions in length will be made for specials and valves. Separate items will be scheduled for each diameter and each type and class of pipe laid.

8.2.2 Extra over for excavation in rock

Unit – m^3.

Note: The volume of rock excavated will be measured as if the trench had vertical sides and to the base width specified.

8.2.3 Extra over for the supplying laying or fixing and bedding of specials and valves

Unit – No.

Note: Specials and valves will be measured by the number of each type class and size. "

PS LB BEDDING (PIPES) (SABS 1200LB)

Clauses referred to in this clause PS LB refer to SANS 1200 LB.

PS LB1 MATERIALS (CLAUSE 3)

PS LB1.1 SELECTED GRANULAR MATERIAL (SUB-CLAUSE 3.1)

Add to sub-clause 3.1 the following:

"Selected granular material (bedding) shall comply with the requirements of the Pipe manufacturers and shall be non-clayey material with a PI not exceeding 6 and free from vegetation and lumps and stones of diameter exceeding 30 mm. Suitable material should be selected from the trench excavations and set aside.
If there is insufficient suitable material available from the excavations in the immediate vicinity material will have to be brought in from excavations further away or from borrow areas."

PS LB1.2 SELECTED FILL MATERIAL (SUB-CLAUSE 3.2)

Amend sub-clause 3.2 with the following:

"Selected fill material shall be material that has a PI not exceeding 20, is free from all vegetation and free of all lumps and stones greater than 25 mm."

PS LB2 CONSTRUCTION (CLAUSE 5)

PS LB2.1 PLACING AND COMPACTING RIGID PIPES (SUB-CLAUSE 5.2)

Class C bedding shall be used for all uPVC and HDPE piping, unless otherwise detailed or specified.

PS LB3 MEASUREMENT AND PAYMENT (CLAUSE 8)

PS LB3.1 SCHEDULED ITEMS (SUBCLAUSE 8.2)

Delete sub-clause 8.2

Note: Payment for bedding is inclusive within the Scheduled Items provided within Section PS L above.

(See PS L5 Measurement and Payment)

PORTION 3: PROJECT PARTICULAR SPECIFICATIONS
PPS 1 VALVES AND FLOW METERS

Valves shall be chosen by suitability for purpose, shall be of well proven concept and shall, where possible, be resilient seated for bubble –tight shut-off. Where brand names have been used, alternatives may be offered which must be accompanied by specification and performance data of the alternative unit. In the absence of such data it may be rejected and the specified unit will be required.

All valves shall be manually operated. Hand wheels for valves shall be cast iron or aluminium and of a robust pattern with corrugated periphery. Arrows shall be provided on all hand wheels to indicate the direction of opening which shall be anticlockwise.

Valves shall be capable of being opened and closed manually by one person only when the specified maximum unbalanced pressure is applied to the valve in use. Under this condition the force required to open the valve from the closed position shall not exceed 125 N at each of two diametrically opposite points on the rim of the hand wheel or at each end of the tee key (i.e. The push-pull" effort needed shall not exceed 250 N).

Working drawings of non-standard valves shall be submitted to the Employer's Representative for approval prior to manufacture. For standard valves, detailed technical sheets shall be submitted to the Engineer for approval.

Unless otherwise specified elsewhere valves components shall be of materials not inferior in strength or resistance to corrosion to those listed below:

Bodies, bonnets, covers	Spheroidal graphite iron
Discs and hinges to cowls	BS2789 grade 500/7 or cast iron to BS 1452, grade 220
Pistons, sleeves, liners	Bronze to BS 1400
Rings, seal holders and stem nuts	Grade LG2
Hinge pins	Bronze to BS 2784 Grade PB 102
Stems	Stainless steel to BS 970: Part 4, grade 431 S29.

All cast iron parts shall be coated in accordance with BS4164.

Each type of valve shall be obtained from a single approved manufacturer

PPS A1.1 Gate Valves and Scour Valves

Resilient seal gate valves (RSV) shall be similar to VOSA configuration and shall comply with SANS 664 (latest amendment) or ISO 9644:2018 with classes and flange drillings as scheduled in the drawings or bill of quantities.

Where plain-ended valves are required, the ends shall be suitable for the type of pipe specified. The valves shall be designed for drop tight closure over the full range of pressures from zero to maximum working pressure in accordance with the requirements of BS 5163.

The valves shall be provided with a straight unobstructed body passage without pockets. The spindle seat shall consist of 2 nitrile rubber O-rings located in a corrosion resistant housing. A wiper ring shall also be provided. The gates shall be completely rubber covered. The gate guides shall be of the tongue and groove type. Spindles shall be manufactured on solid stainless steel and shall be of non-rising type. Facilities shall be provided for repacking the gland whilst the valve is under pressure in the open or closed position.

Valves shall be grit blast cleaned to S15 standard and a solvent-free sintered epoxy powder applied in one coat using arc-spray machines to provide a dry film thickness of not less than 450 microns. The body of the valve shall be coated to a minimum DFT of 250 microns.

Extension spindles and brackets shall be provided where detailed shall be suitably supported to prevent swaying and buckling, and to guarantee the intended use of the valve.

Hand wheels shall be clearly marked with the direction of opening. All valves shall be clockwise closing. All valves shall be capable of being operated manually with a maximum applied torque of 150Nm for valves with a nominal diameter of more than 450mm and 100Nm for valves with a nominal diameter less than 450mm.

Gate valves 40mm and smaller shall be cast brass to SABS 776 type Cobra or similar approved.

PPS A1.2 AIR AND Vacuum BreaK Valves

Air release and vacuum break valves shall be double orifice with anti-shock orifice mechanism, of type "Vent-O-Mat Series RBX, or ARI Air Valve" or similar approved with flanged inlets and rated for a minimum of 10 bar working pressure or as specified.

The valve shall have an integral surge alleviation mechanism which shall operate automatically to limit transient pressure rise or shock induced by closure due to high velocity air discharge or the subsequent re-joining of separated water columns. The limitation of pressure rise must be achieved by deceleration of approaching water prior to valve closure.

The intake/discharge orifice area shall be equal to the nominal size of the valve.

The inlet shall be fitted with an isolating valve. Valves with air intake or exhaust facilities shall have approved screening arrangements to prevent the ingress of foreign matter.

Air valves shall be drop-tight at all pressures from 0.2 bar to the test pressure specified for the pipeline. The mechanical strength of the valve shall be such that it can withstand the test pressure specified for the pipeline (or 1.5 times the maximum working pressure, if higher) without suffering permanent deformation of any part of the valve.

PPS A1.3 Butterfly Valves

All butterfly valves must be provided with a gearbox and hand-wheel mechanism unless otherwise detailed and it must be possible to install the unit between flanges drilled according to SANS specifications. Valves are to have a stainless-steel stem and are to incorporate a resilient disc seal mechanically retained around the periphery of the valve disc. Working pressure required is 16 bar, or as detailed in the Bill of Quantities and/or the drawings.

PPS A1.4 Non-Return Valves

Unless specified, non-return valves shall be of wafer type, a cast iron body, stainless steel plates with machined sealing faces, 316 stainless steel pin and springs, nitrile seat and Teflon or similar bearing washers.

PPS A1.5 Control Valves

Control valves must meet the requirements of ISO 9635-5:2014.

All Diaphragm Actuated Control Valves shall be hydraulic valves (similar to GULF or DOROT configuration) with full-bore seat and must be equipped with a three-way multidirectional control valve that enables manual and automatic control. Selection must ensure that cavitation does not occur and that the velocity of flow is within the manufacturer's standard recommendations.

The following features are required, unless otherwise specified:
Working pressure of 2 m to 100 m (0.2 bar to 10 bar).
Test pressure of 160 m (16 bar).
Max working temperature of 60˚C.
Body material: Reinforced nylon or cast iron with electrostatic powder coating polyester fully resistant to agricultural chemicals.
Minimum performance standards as follows:

Nominal valve size	80 mm	100 mm	150 mm
Head loss coefficient K	≤ 3,5	≤ 4,0	≤ 5,0

Control systems on raw, unfiltered water must incorporate a large agricultural filter that is able to cope with raw water.

PPS A1.6 Water meters

Water flow meters must meet the requirements of ISO 16399:2014 Meters for irrigation water.

Where mechanical flow meters are required, they must be suitable for work in agricultural environments that have poor quality water and high silt loads, and they must be able to operate in an environment characterised by significant vibration. The unit must include an electrical outlet, EV (Volume) to connect to a totalizer on the main switchgear.

The following features are required, unless otherwise specified:

Working pressure of 2 m to 100 m (0.2 bar -10 bar).
Test pressure of 160 m (16 bar)
Accuracy of +- 5% between Q1 (minimum capacity flow) and Q2 (transfer capacity flow),
Accuracy of +- 2% between Q2 (transfer capacity flow) and Q4 (maximum capacity flow),
Max working temperature of 50˚C
Body material: Reinforced nylon or cast iron with electrostatic powder coating polyester fully resistant to agricultural chemicals and suitable for internal and external use.
Minimum performance standards should be according to the Standard Flowrate Ranges.

Flanged Magnetic Water Meters must be supplied (or as indicated in the BOQ) complete with Signal Converter and Display and must be water resistant to IP 65 and able to be calibrated "dry" on site. The meter shall have an epoxy powder coated aluminium cabinet.

PPS A1.7 Gauges

Gauges shall be mounted vertically and in such a position that it can easily be read from floor level. Where this cannot be done the Engineer's requirements shall be ascertained. Isolating and bleed cocks shall be provided for each pressure gauge, except on installations for hazardous fluids.

PPS 2 SPRINKLER IRRIGATION

PPS 2.1 Scope

This specification covers the sprinkler and micro sprinklers to be installed within Batch 4 - Lot 6a of the Lower Usutu Smallholder Irrigation Project (LUSIP) II

PPS 2.2 Block Hydrant Valves

Valve: SANS/ISO approved Pressure Regulating Gulf, Bermad, Gal, Saunders or Kim or approved equivalent.
SANS/ISO approved Pressure gauge to be permanently fixed downstream of pressure regulating valve.
SANS/ISO approved Standpipes: Galvanised
SANS/ISO approved Fittings: Galvanised or Plasson and Astore.

PPS 2.3 Riser Valve Assembly

Saddle: Plasson or Astore with 25mm outlet and stainless-steel nuts and bolts.
Standpipe: 25 mm Galvanised steel Pipe

PPS 2.4 SEMI-SOLID Sprinklers

Sprinklers for semi-solid sprinkler irrigation shall be as follows (or similar approved):

Riser Piplet: 25mm aluminium piplet with 20 mm swaged elbow.
Dragline Hose: 20 mm Conflex 779 length to suit requirement.
Hose Clamps: 20 mm stainless Steel with hexagonal nut.
Hot dipped galvanised Tripod: 20 mm x 1.2m Tripod with 20 mm swaged nipple.
Sprinkler Pressure Regulator: 300 kPa to fit on top of Tripod.
Sprinkler Model &Type:

Impact sprinkler VYRSA 35
Spacing to be 15 m x 15 m.
Flow rate 0.24 l/s @ 30m operating pressure.
with single 3.57mm nozzle

PPS 2.5 MICRO-JET Sprinklers

Sprinklers for micro- jet irrigation shall be as follows (or similar approved)

Supernet Short Range(SRD) with deflector plate with male press fitting (Green Nozzle)
Emitter Spacing: 3m
Lateral Spacing: 6m
Flow rate 50 l/h @ 20m working pressure
Inclusive of Supernet heavy duty Poly Stake

All hose clamps are to be entirely stainless steel.

PPS 2.6 TESTING (NON-MICROJET)

On commissioning the following tests shall be carried out for each semi-solid sprinkler field:

Rain gauges are to be placed on a 2m x 2m square grid between four sprinklers in the centroid of the irrigation block. The block pressure and flow rate must be noted. The results of irrigation intercepted, and pressure must be provided to the Engineer to check uniformity. Emitter uniformity (EU) of greater than 90% must be obtained.

PPS 3 CENTRE PIVOT IRRIGATION

PPS 3.1 General Description

The centre pivot irrigation system shall be electrically powered and controlled to maintain a predetermined operating speed and correct alignment. The drive train shall have electric motors powered by 400 volts 3-phase electricity. The electric motor and centre drive shall provide power to the wheel gearboxes at each end of the drive tube. The wheel gearboxes will have pneumatic rubber tyres. 3-phase electricity, 400 volts, shall also power the centre pivot control panel. It shall be a computerised panel that allows for programming start and stop times. There will be an end of pivot light and a light at the pivot control panel to illuminate the panel. The system shall be set up with provision for a telemetry package to control the pivot from a personal computer at a base station. This program should be capable of keeping records of the amount of water applied. Sprinklers shall be mounted on drops. The centre pivot sprinklers shall be of uniform nozzle size. The spacing of the sprinklers shall be variable to suit and achieve uniform application.

PPS 3.2 SPECIFICATIONS

PPS 3.2.1 Structure

The Centre Pivot shall have a heavy duty pivot point structure constructed of four legs. Each leg shall be minimum 100 mm x 100 mm x 10 mm angle iron and must be 3.35 m or long enough to suit required tower height. Each side shall have at least three internally mounted angle iron horizontal ties with dimensions of 76 mm x 50 mm x 5 mm (bottom), 63 mm x 50 mm x 5 mm (middle) and the top tie on each side shall be 40 mm x 40 mm x 4 mm angle iron. Non-tow anchor weldments are used on non-towed structures for the footings. The footings must be bolted to the outside of the pivot point legs and not to the inside of the legs. The base of the pivot point shall measure at least 3.1 m x 3.1 m on the outside of the pivot legs. Smaller dimensions will not be acceptable. The tenderer shall specify the following for each unit supplied;

Unit Number	Total Length	Number of Spans	Span Lengths and Pipe O.D.	Overhang Length and Pipe O.D.

Pipe Diameter. The centre pivot lateral pipeline size shall be suitably sized to meet length and size requirements as per table below.

Pipe Diameter (mm)	Maximum Span Length (m)
254	38
219	49
168	60
152	60
127	60

The centre pivot lateral pipeline shall use sprinkler outlets which are formed and tapered from the pipe material. The pipeline must either be hot dipped galvanized, stainless steel, aluminium or equally suitable to be approved by the Engineer. The outlets shall be roll-threaded to form a tapered outlet. The thread profile must be tapered such that 20 mm NPT sprinklers and pipes will exactly seal against them. Sprinkler outlets must be exactly placed. The forming of the outlet is accomplished through robotically forming the outlet. Sprinkler outlets with welded couplers and straight threads will be unacceptable.

Towers shall be constructed of four legs, each with the dimensions of 100 mm x 75 mm x 6 mm and 3.3 m long. Three horizontal ties shall be on one side of the tower structure. They shall be constructed of 50 mm x 50 mm x 4 mm angle iron. One stabilizer attachment will be on each side of the tower. These stabilizer attachments shall have a cross dimension of 75 mm x 75 mm x 5 mm. Stabilizer angles shall be crossed and attached to the tower legs at the stabilizer attachments and to the bottom of the truss braces, not to the mainline pipe. The truss brace ends of the stabilizer angles shall be about 1.5 m apart. They will be constructed of 75 mm x 75 mm x 5 mm angle iron that is 6 m long.

The drive tube shall be at least 168 mm, 11 gauge tubing and 4.2 m long. Tower leg mounting plates shall be welded to the drive tube frame in an "A" type frame. This "A" frame shall consist of a tower leg mount and a leg mount brace. The tower leg mount and leg mount brace shall be formed from steel with a 6 mm thickness. The tower legs are bolted to the "A" type frame.

The undertruss shall be of a bowstring design with up to 8 members between each drive unit. The truss rods shall be 20.6 mm diameter with integral hot formed heads. One length of truss rods shall be allowed on standard span lengths to ensure uniform loading and an uniform arch in each span. The truss rods should be anchored to 10 mm rod anchors, not through the pipe flanges. The rod anchors use a safety factor of 2.5.

Truss braces shall be in a "V-jack" design. There shall be a truss brace pair on each side of the pipeline. The truss braces shall connect to the ear brackets on the pivot lateral pipeline. A truss tie shall connect the bottom of each truss brace pair on each side of the pipe. An angle truss plate is bolted between two truss braces on each side of the pipeline. It is bolted directly underneath the centre pivot lateral pipeline to the truss braces. Each set of four truss braces and cross ties shall be spaced 22 metres apart on standard span lengths. The truss braces shall be the dimensions of 50 mm x 50 mm x 5 mm and 50 mm x 50 mm x 3 mm. Truss ties shall be the dimensions of 40 mm x 40 mm x 3 mm and the third tie shall be the dimensions of 50 mm x 50 mm x 3 mm. The angle truss plates shall be 3 mm thick.

Clearance between truss rods and ground shall be no less than 2.7 m.

Upon fabrication, all structural steel members, such as the span pipe, angle iron, small trussing parts, central pivot members and self-propelled tower members, shall be hot-dipped galvanized to ASTM 123-73 specifications. A heavy coat of galvanization of not less than 3.5 mils (0.089mm) average shall be applied. Painting and other types of applied coatings will not be acceptable on these members.

All bolts shall be Grade 5 or better. All structural assemblies shall use locknuts on the bolts. The locknuts and bolts shall be zinc plated.

A factor of safety of 1.5 applied to yield strength shall be used in all structural calculations except:
The system shall be designed to withstand wind loads at velocities of 150 km/hr. and a 1.1 safety factor. The wind load calculation shall be made without water in the system and with the system located on flat ground.

The pivot structure and all other structural members shall be designed to applicable SABS specifications, or in the absence of SABS, the applicable AISC.

All welding shall be done in accordance with best welding practices and welding shall be done by qualified welders.

PPS 3.2.2 SPAN COUPLERS AND JOINTS

The coupler construction shall be an external split aluminum coupler comprised of two halves bolted together with a flexible one-piece rubber inner boot having a compression V-lip seal at each end to provide sealing. The gaskets shall seal tight when operating water pressure is applied. The coupler shall be free to flex and shall carry no structural loading. The design shall be such that the inner boot can be changed readily without requiring heavy lifting equipment or extensive dismantling of the span. Exposed rubber boots with tee clamps will not be acceptable at the tower joints.

All joints shall be constructed like a large universal joint for allowing movement of the spans. There shall be four points of attachment on a ring. Attachment will be made with 20mm -10 x 50 mm Gr. 5 bolts and 20 mm lock nuts. This joint will distribute motion uniformly. These joints are capable of traveling on lateral or transverse slopes up to 15%. Ball and socket joints or internal hook and eye type will not be used. There shall be no internal obstructions causing turbulence or flow reduction within any sections of the pivot pipe.

Each joint shall be equipped with an automatic drain in the lowest point of the span. These drains close when under pressure and open when the pressure is relieved. The appropriate drain material shall be selected based upon system operating pressure.

PPS 3.2.3 WHEEL GEAR BOXES FOR SELF PROPELLED TOWERS

The wheel gearbox is located at each wheel and is constructed of a bull gear and worm gear shaft. It shall develop torque adequate to propel the system up to 30% slopes. The wheel gearbox drive shall be capable of delivering at least 67.2 kNm of instantaneous torque and at least 33.6 kNm of CONTINUOUS torque. The gearbox shall deliver vertical loads of 3200 kg CONTINUOUS and 4100 kg intermittent load. The wheel gearbox drive shall have an output ratio of 50:1.

Mechanical specifications of the wheel gearboxes shall include, but will not be limited to, the following considerations:

Gear cases will be designed specifically for centre pivot systems.

The wheel gearbox shall have two double lip seals on the worm gear shaft and triple lip seals on the output shaft.

Wheel gearboxes shall be filled with 85140-GL5 oil to the normal operating level, which shall submerge all bearings. Wheel gearbox oil quality will meet MIL-2105B specifications. Replacement of oil and oil specifications must be met as noted in the Centre Pivot Operation Manuals.

The wheel gearboxes will be hermetically sealed. An expansion chamber will be incorporated to maintain minimal changes in internal pressure due to temperature changes (66oC), and providing total isolation from water vapor transfer into the gear case. Internal expansion chamber volume shall be at least 5 x 10-4 cubic meters (m3). A smaller volume of internal expansion chambers will be unacceptable.

The bull gear is manufactured from gray iron with a Brinell hardness of 240. The bull gear has an outside diameter of 225 mm and an inside diameter of 130 mm. The face width is 50mm while the web thickness is 25 mm.

The worm gear shaft consists of high tensile 1045 material with a Brinell hardness of 210. It has a dual 25 mm input shaft, a 60 mm diameter worm gear and a bearing spread of 150 mm.

The bull gear and worm gear shaft pressure angle have been designed at 14-1/2 degrees.

The wheel gearbox shall have high strength iron worm gear shaft end caps with steel inserts held by 4 bolts. Each end cap shall have a water ledge to deflect water off the case away from the seal area.

The bull gear and worm gear shaft will use a four tooth engagement in its gear tooth mesh.

Wheel gearbox shaft stress, including the output shaft, shall conform to AGMA Standard #260.01.

The output shaft shall be 60 mm in diameter to assure suitable rigidity to maintain gear alignment. This dimension is continues from the wheel shaft bearing and inward to the wheel gearbox. The output shaft shall be no longer than 40 mm between the bearing and the wheel mounting face to minimize weight loads on the shaft.

The wheel mounting face shall have a 150 mm pilot for wheel support. The pilot is a flange for wheel support. There must be eight 25 mm diameter lug nuts to bolt the wheel to the wheel mounting face. The face shall be 225 mm in diameter. The non-pilot thickness shall be 13 mm. With the pilot, the thickness of the face will be 22 mm. Wheel mounting faces without the pilot face or with lug nuts smaller than 25 mm in diameter will be unacceptable.

The wheel gearbox will use five 13 mm bolts to attach the gearbox to the gearbox mounting plate welded to the drive tube. The bolt holes are in a circle pattern.

Each wheel gearbox reduction mesh will be capable of passing the following 500 hour unidirectional qualification test without scoring, pitting or breaking.
Random loading.

Minimum output torque – 5.6 kNm.
The output torque shall vary between 10.1 kNm and 30.8 kNm. and will be applied for no less than 10% of the time.
The load shall be at least 13.4 kNm. for at least 25% of the time.
Power will be interrupted each minute (approximately) and the mesh allowed to remain static for one minute (approximately) to provide a "start-stop" cycle.

The design and rating of all wheel gearbox meshes will be of substantial agreement with the norm established in AGMA Standard 440.03. The bull gear and worm gear shaft shall achieve proper fit at the beginning of operations.

PPS 3.2.4 DRIVE SHAFTS AND ALUMINUM COUPLERS

Drive shafts shall be 22 mm square. They shall be able to deliver a maximum torque to the wheel gearboxes. Minimum deflection of the drive shaft shall not exceed 1/360 of the span length.

Aluminum drive shaft couplers will be used at the end of each drive shaft. Aluminum couplings used to join the centre drives, drive shafts and wheel gear boxes and will be designed to facilitate removal.

PPS 3.2.5 CENTRE DRIVE GEAR BOXES AND ELECTRICAL MOTORS

Each tower shall be propelled by a centre drive gearbox and an electrical motor approximately located at the centre of each drive tube.

Mechanical specifications of the centre drive gearboxes shall include, but will not be limited to, the following considerations:

Gear cases will be designed specifically for centre pivot systems.

Centre drive output rotating shaft sealing shall include four single lip, 2 seals per side, spring loaded oil seals.

Centre drive gearboxes shall be filled with 20W-GL4 oil to the normal operating level, which shall submerge all bearings. Replacement of oil and oil specifications must be met as noted in the Centre Pivot Operation Manuals.

The centre drive gearbox shall be a triple gear reduction and of the spur gear type. The gears shall provide an output ratio of 40 to 1 for the electrical motor. No helical gears are used. The gears shall be made from powdered metal and not heat treated or machined.

The centre drive gearbox shall be capable of 4 kNm output torque. It shall be 95% efficient.

The electric motor's design shall comply with applicable provisions of NEMA and IEEE standards.

The electric motor will be designed specifically for centre pivot applications including the special considerations of keeping moisture out. The electric motors shall be provided with a metal shroud which protects it from rainfall and spray applications. In addition, the shroud shall provide for movement of cooling air over the surface of the electric motor. The shroud will be covered by a plastic motor cover for additional water protection. The electric motors shall be rated for a continuous duty cycle and have inherent overload protection. The winding insulation shall be double varnish dipped and baked, and shall be NEMA Class “B” or better. Ball bearings shall be double sealed.

The centre drive motors for the centre pivot shall consist of the following:
3/4 HP, 43 RPM
1.5-amp (full load) at 480V and 1.43 amps (full load) at 380V
a 3/4 HP TENV
40:1 ratio
43 RPM output at 60 HZ and 33 RPM output at 50 HZ
3 phase

PPS 3.2.6 WHEEL SETS

Each self-propelled tower shall be provided with at least two rubber tyres. All tyres provided shall be of the same manufacturer and model. These will be of an agricultural load tractor type with a suitable lug design (R-1) and an adequate load rating.

The tyres shall be 14.9” x 24” tyres with 300 mm wide rims. The tyres shall have a tread width of 370 mm, a diameter of 1265 mm, a circumference of 4546 mm and a contact area of 0.22 m2, alternatives by pivot manufactures will have to be approved by the Engineer.

PPS 3.2.7 GENERAL ELECTRICAL SPECIFICATIONS

Electrical service to centre pivot equipment should meet the American Society of Agricultural Engineers (ASAE) Standard S397.2 "Electrical Services and Equipment for Irrigation.”. The centre pivot shall meet the American Society of Agricultural Engineers (ASAE) Standard S362.2 "Wiring and Equipment for Electrically Driven or Controlled Irrigation Machines."

The following sections of the National Electric Code (NEC) apply to electric drive centre pivot irrigation systems, and shall be adhered to accordingly.

Article 250-51 Effective grounding. Article 250-114 Effective grounding.
Article 310 Minimum size of conductors.
Article 210-5 Color code for branch circuits.
Article 430 Motors, motor circuits or controlled.
Article 675 Irrigation machines.

All control panels shall be readily accessible to the maintenance personnel. They shall be totally weatherproofed. Entrances into, exits from and penetrations of the enclosure shall be made in such a manner as to reduce the possibility of collection of water or contaminants at the point of connection and

shall also be made in such a manner as to preserve the minimum SABS or NEMA 3R rating of the enclosures. NEMA 3R states that the control panel enclosure is outdoor and weather resistant. Dimensions of enclosures shall not be less than the maximum dimensions of the enclosed equipment plus the required electrical clearances as specified in the National Fire Protection Standard No. 70, National Electrical Code. Enclosures shall be made of corrosion resistant materials and shall have doors covering the controls to prevent damage. Doors will have non-corroding hinges or other means of attachment. Locking mechanisms shall also be provided on the master control panel and the main disconnect.

A Control Panel for each pivot shall be mounted to the pivot point. The Control Panel shall include the following controls and features.

The control panel shall include the following controls and features.
System power controls
Forward and reverse directional controls
Digital percent timer to enter mm or percent rates
Absolute position monitor and controls of field location (0-359 degrees)
Auto-restart
Programmable auto-shutdown and auto-reverse controls
Two (2) auxiliary controls
Nine (9) automated user-defined irrigation programs with up to twenty (20) steps each
Four (4) programmable endgun tables with up to eight (8) steps each
50 step history log showing date, time, location and pivot events
Timers for run-time, endgun, pivot, pump, auxiliary 1 and auxiliary 2
Programmable service stop
Monitor pressure with optional sensors
Pump protecting delays and timer limits
Deviation of speed based on temperature or time
Low pressure shutdown and restart
Low voltage shutdown and restart
Pump load management
User-friendly menus and prompts
Easy on-line diagnostics on the run-time screen
Rainfall shutdown (with optional sensor)
High wind shutdown (with optional sensor)
High flow and low flow warnings (with optional sensor)
R-MAC and Telemetry compatible

A Nameplate shall state the manufacturer's name, the design voltage, phase, frequency of the incoming power supply and the amperage per phase, which shall be the current of the recommended over current protection for the main power circuit.

Transformers shall be capable of handling voltage reductions required for all functions of the control system. Transformers shall be of the isolation type with proper over current protection for the transformers, conductors or control device they serve. All control circuits shall operate at 120 vac. Except for the remote pump kill, which operates at 24 vac.

The panel classification shall be IP65 - rain proof – sleet resistant - outdoor type.

There must be a main circuit breaker disconnect in the panel to shut off the flow of power through it.

A four (4) line by 40 character LCD screen shall present information on the following:

Day of week and Date (month and day)
Time (hour:minute:second am/pm)
Manual mode or program mode (program number and next step to run)
Pivot Pressure
Temperature
Voltage
Absolute Field position (0-359 degrees)
Full Circle Time (at current application rate)
Service stop setting
Auto Reverse Status (on/off)
Auto Restart Status (on/off)
Pivot status
Rotation Status
Depth Applied or Percent Setting

The LCD screen should also provide the following statuses:
Countdown of pump timers (restart delay, pressure-up delay and pump recovery)
Hours of operation for; pivot, pump, endgun (if equipped), auxiliary 1 and auxiliary 2
With optional flow meter; water flow rate, two (2) totalizers (one non-re-setable and one re-setable)
With optional rain sensor; total rainfall, period rainfall, shutdown value and shutdown period, where total and period rainfall is re-setable and logs the date reset
With optional wind sensor; wind heading, wind speed, recorded high, wind speed shutdown and delay time

System operating information must also be shown via LED's next to the applicable function keys for the following information:
Rotation status(reverse, off or forward)
Status of auxiliary equipment
Wet or dry mode
Endgun status (if equipped)

It must have the ability to operate the system either manually or via a preset program.

There will be a Wet-Dry operations key to permit operation of the pivot during periods when no spraying is required.

Speed of the last tower shall be controlled by either percent setting or depth of application.

There shall be a recording device to accumulate the total number of hours of operating time of the pivot, pump, end gun and (2) auxiliaries.

An Automatic Restart feature shall be available to restart the pivot after a momentary power interruption and after power is restored.

There will be a Low Temperature shutdown feature to prevent the pivot from operating below a preset temperature.

There will need to be the following features:
An End Tower light must be available, which readily allows the operator to see from a distance when the centre drive motor for the last tower is on or off.
A Main Panel Light must be available to illuminate the Master Control Panel and facilitate operation of the system at night.

The panel must have the ability to be programmed based upon its position in the field. The degrees of rotation of the system are to be determined by an absolute position encoder mounted near the top of the pivot riser.

The panel will be have provision to be used with a Telemetry package.

A main disconnect switch is to be provided with over current protection and capable of being locked in the OFF position. It is located at the point of connection of electric power to the machine. The switch shall be rated at 30 amps and 600 volts minimum. A suitable lightning arrestor shall be provided.

Tower alignment control shall be of an approved type. It shall use microswitches and motor contactors actuated through a mechanical linkage from a uni-knuckle joint. The tower alignment mechanism shall be electrically and mechanically operated. The mechanical linkage shall be a threaded stainless steel alignment rod. One end of the threaded rod shall have a metal ball and socket joint bolted to a cam arm. The cam arm is bolted to a cam that it turns, which then actuates two micro switches. One micro-switch shall control the "on" and "off" intervals of the centre drive motors. A second switch shall act as a safety shut down of the centre pivot to the pivot control panel if misalignment occurs. The other end of the alignment rod shall also have a metal ball and socket joint that is bolted to an arm welded to the uni-knuckle joint. This end of the alignment rod shall be adjustable.

There shall be a spring connected to the cam to provide resistance to the cam arm. It shall be 0.047 hard drawn wire with a 0.375 O.D. Its length at rest shall be 70 mm. It shall be zinc plated.

The cam and cam arm are constructed of special acetal-delrin 500 materials. There shall be no steel cam assemblies or nylon bushings. The alignment mechanism will not be affected by changes in the terrain for slopes up to 30%.

The alignment system shall be capable of operating when the machine is reversed without the necessity of making adjustments.

Machine safety shall shut the system off if normal alignment is not maintained. There shall be safety interlocks. One such device is an electrically actuated misalignment mechanism to render the system inoperative if misalignment of the system occurs. The water supply is also shut off during the time the system is rendered inoperative. An overwatering safety device will render the pivot inoperative if the end tower stops for more than a pre-set number of minutes. A controlling timer shall be of the variable type with time settings between zero and five minutes, and will adjust per main panel percentage rate.

Each tower shall have a tower box to control its functions. The tower box is UL/C.S.A. listed - Industrial Control Panel. The box shall include:

A definite purpose extended life contactor rated at 25 amps, 600 volts, 10 h.p, and for 1 million mechanical operations.

Micro-switches rated 277 volts at 15 amps, 1/4 h.p. and tested to 10 million cycles. They shall be constructed of a snap spring, type 301 stainless steel, with a copper inlay strip and with silver contacts.

On-off switch rated at 10 amps and 600 volts to stop the machine at any time.

Each tower box shall be fitted with a suitable weather-tight enclosure. This enclosure shall be constructed of a polycarbonate base and polypropylene cover. The cover must have a positive seal against the base and it must be corrosion resistant. Neither shall any foam seals be used to seal the cover to the base.

All systems shall have proper grounding. The grounding conductor must be supplied with the electrical service to serve as an interconnection between the power source ground and all noncurrent carrying metal parts of the installation. This would include the disconnect switches, pump panels, conduit, junction boxes, pump motors and the centre pivot. This conductor must be sized properly to carry any fault current that could develop. The centre pivot and master control panel shall be connected to a driven grounding electrode in accordance with the latest edition of the National Electrical Code (section 250).

Safety signs describing the automatic starting of the machine, grounding requirements, high voltage, caution and other pertinent safety signs shall be provided and prominently displayed.

An external collector ring shall be used on the pivot point structure. The external collector ring shall have a minimum of 10 rings rated at 30 amps and 600 volts. Dual spring loaded brushes on the rings shall have an area of 1.61 cm2. External collector ring enclosures shall be weather tight to eliminate the possibility of ingression of moisture or contaminants at the points of connection. The shield is constructed of fiberglass. The electric cable connecting the main panel to the collector ring shall be outside any water-carrying member. A power cable going through the inside of riser is unacceptable.

The position encoder shall be located in a water tight enclosure. The enclosure shall be constructed of the same material that the tower box is constructed. This enclosure shall be bolted to the pivot head. An 200 mm pin ring shall be bolted to the pivot ell pipe. The position encoder shall have a shaft attached to it. The shaft shall be attached to an 200 mm encoder gear. The encoder gear shall have grooves along the edges that the pins of the 200 mm pin ring rest. The position encoder shall be an absolute position monitor

and know where exactly the rotation of the pivot is at from 0 to 359 degrees. As the pivot ell rotates the 200 mm pin ring, it shall turn the 200 mm gear plate. This plate will thus turn the absolute position encoder.

Conductors in the irrigation cable shall be at least #14 gauge copper type THWN stranded for all control circuits, at least #18 gauge copper type THWN stranded for low current signal carrying circuits and at least #14 gauge copper type THWN stranded for all three phase motor power conductors. Conductors used to connect or interconnect to or between components within an enclosure shall be rated not less than 600 vac. for circuitry utilizing 300 volts or less and not over 600 vac. Cable jacketing shall be resistant to sunlight, moisture and corrosion as per NEC 675-4. It should also provide mechanical protection, flexibility and be suitable for operation within a temperature range of –4.4oC to 60oC. All conductors shall be color coded for proper identification and this coding shall be uniform throughout the entire system.

If provision is provided, then there shall be a booster pump for the endgun.

H. NOZZLING

The sprinklers should be placed on flexible hose drops that are 3.5metres from the ground. The distal pressure at the end of the system should be 24 kPa. A sprinkler with a wide radius of throw should be used. This will keep the average application rate low. The sprinklers should be regulated to provide even application of water across the field. Uniform nozzles shall be used with variable spacing for ease of use by small scale farmers.

The sprinklers need to provide some evaporation and mixing of air to allow decrease in odors.

Where specified, a large volume gun on the end of the system should be able to add approximately 100 metres to the length of the centre pivot radius.

PPS 4 DRIP IRRIGATION

PPS 4.2 SCOPE

This specification covers the buried and surface drip irrigation to be installed within Batch 4 - Lot 6a of the Lower Usutu Smallholder Irrigation Project (LUSIP) II

PPS 4.1 DRIPLINE AND FITTINGS (SUB-SURFACE BURIED)

The pipe supplied shall be as indicated in the pricing schedule or similarly approved. In general, the following shall apply:

The pipe should conform to the SANS/ISO 8779:2010 standard. In the case of integral drippers, unique pipe diameters are sometimes manufactured that may not conform to the ISO/SANS specifications. In these cases, it is, however, still important that the pipe material should conform to the specifications with regard to the mother material, UV protection, resistance against algae and bacteria, as well as performance at high temperatures (see SANS 8779:2010 paragraph 4).

The pipe should be able to withstand a maximum working pressure of 2,8 bar, and it shall have an internal diameter no less than 15,5 mm and a wall thickness of more than 0,60 mm. The dripline must be suitable for burial at depths of up to 0,35 m and the material must not deteriorate under such conditions or environmental stress before 12 years.

In the provision of rates for dripline, accessories that are required for installation, such as pipe lubricants, drill bits, punches etc. must be allowed for in the rate. The contractor must ensure that such quantities are sufficient for installation.

The supplier must ensure that the correct fittings are provided for connection of the driplines to the submains (headers), blind pipe and flushing manifolds.

Blind pipe shall be supplied that meets or exceeds the pressure rating of the dripline. It shall have an internal diameter of no less than 14.5 mm.

PPS 4.1.1 EMITTERS

Emitters shall be Pressure Compensated Anti-Siphon, continuously self-cleaning integral emitters, including extra resistance to root intrusion with an inlet located towards the centre of the pipeline. The following requirements must be met:

The emitter flow rate shall be 1,0 l/h.

Maximum emitter spacing shall be 0,6 m.

Maximum lateral Spacing 1,9 m

The emitter flow rate shall not vary (be fully compensated) from the selected flow rate in the full range of pressures between 5 m and 30 m water pressure.

The coefficient of manufacturing variation of the emitters (CV) must be better than 3%.

The emitter design must be a non-welded labyrinth resulting in a turbulent flow path, incorporating a silicon diaphragm. The flow path must include at least 11 teeth.

All components are to be resistant to UV and standard nutrients used in agriculture, and to comply with the requirements of ISO 9261.

The secondary head loss factor (or dripper local head loss coefficient, KD) must be lower than or equal to 0,55.

The emitter passage dimension must have a water passage length of less than 10 mm, the smallest open dimension must be ≥ 0,60 mm and a cross-sectional area no less than 0,366 mm2. Any dimensions relating to the emitter must not cause the extent for upstream filtration to be finer than 100 microns.

The emitter filtration area must be ≥ 36 mm²

The dripper must have an anti-siphon mechanism and it must be a flat dripper (not cylindrical).

PPS 4.1.2 FITTINGS

Fittings must be suitable and guaranteed for:

Drip-tight connection to the supplied driplines, blank pipes, PVC, HDPE and LDPE pipes utilised in the system under pressures of up to 3,0 bar.

Fittings must enable easy fitment and be manufactured from components that exceed the lifespan of the dripline (> 15 years).

Fittings shall not cause weakness in the fitted pipe by virtue of sharp protuberances or over-sizing causing stretching or crimping.

Suitable drills, lubricants etc. for the installation of these fittings in PVC, HDPE or LDPE must be provided and priced within the rate for supply of the fittings. The quantity recommended and priced by the supplier is to be included in the response to Tender.

PPS 4.2 DRIPLINE AND FITTINGS (SURFACE)

The pipe supplied shall be as indicated in the pricing schedule or similarly approved. In general, the following shall apply (unless specified differently in the BOQ or drawings):

The pipe should conform to the SANS/ISO 8779:2010 standard. In the case of integral drippers, unique pipe diameters are sometimes manufactured that may not conform to the ISO/SANS specifications. In these cases, it is, however, still important that the pipe material should conform to the specifications with regard to the mother material, UV protection, resistance against algae and bacteria, as well as performance at high temperatures (see SANS 8779:2010 paragraph 4).

The pipe should be able to withstand a maximum working pressure of 2,8 bar, and it shall have an internal diameter no less than 15,5 mm and a wall thickness of more than 1,0 mm. The dripline for sub-surface installation must be suitable for burial at depths of up to 0,35 m and the material must not deteriorate under such conditions or environmental stress before 12 years.

In the provision of rates for dripline, accessories that are required for installation, such as pipe lubricants, drill bits, punches etc. must be allowed for in the rate. The contractor must ensure that such quantities are sufficient for installation.

The supplier must ensure that the correct fittings are provided for connection of the driplines to the submains (headers), blind pipe and flushing manifolds.

Blind pipe shall be supplied that meets or exceeds the pressure rating of the dripline. It shall have an internal diameter of no less than 14,5 mm.

PPS 4.2.1 EMITTERS

Unless otherwise specified in the BOQ or drawings, emitters for above-ground installation shall be Non Compensated Anti-Siphon, continuous self-cleaning, including anti-siphon and anti-drain mechanism integral emitters with an inlet located towards the centre of the pipeline. The following requirements must be met:

The emitter flow rate shall be 1,0 l/h at 10m working pressure.

Emitter spacing shall be 0,3 – 0.6 m.

Lateral Spacing to be 1.2 m

The coefficient of manufacturing variation of the emitters (CV) must be better than 3%.

The emitter design must be a non-welded labyrinth resulting in a turbulent flow path, incorporating a silicon diaphragm.

All components are to be resistant to UV and standard nutrients used in agriculture, and to comply with the requirements of ISO 9261.

The secondary head loss factor (or dripper local head loss coefficient, KD) must be lower than or equal to 0,55.

The emitter passage smallest open dimension must be ≥ 0,60 mm and a cross-sectional area no less than 0,366 mm2. Any dimensions relating to the emitter must not cause the extent for upstream filtration to be finer than 100 micron.

The emitter filtration area must be ≥ 36 mm2.

The dripper must have an anti-siphon mechanism and it must be a flat dripper (not cylindrical).

PPS 4.2.2 Fittings

Fittings must be suitable and guaranteed for:

Drip-tight connection to the supplied driplines, blank pipes, PVC, HDPE and LDPE pipes utilised in the system under pressures of up to 3,0 bar.

Fittings must enable easy fitment and be manufactured from components that exceed the lifespan of the dripline (> 15 years).

Fittings must allow multiple re-use.

Fittings shall not cause weakness in the fitted pipe by virtue of sharp protuberances or over-sizing causing stretching or crimping.

Suitable drills, lubricants etc. for the installation of these fittings in PVC, HDPE or LDPE must be provided and priced within the rate for supply of the fittings. The quantity recommended and priced by the supplier is to be included in the response to Tender.

PPS 4.3 INSTALLATION

Installation is to include for all costs associated with the supplier's staff and equipment required to carry out the successful installation, testing and commissioning of equipment on site.

It is the Installation Contractor's responsibility to care for the dripline against natural causes and security from theft, vandalism etc.

Suitable storage must be planned to ensure that the rolls are not damaged by weather, moisture or sunlight.

Installation of the dripline must be carried out using RTK GPS controlled installation equipment that results in an accuracy of horizontal placement of less than 2 cm. Equipment must be selected to ensure a minimum rate of 15ha per day can be achieved. It is recommended that standby units be planned.

Great care must be exercised to ensure that installation does not cause the ingress of dirt into the dripline. Ends not connected must be closed and flushed clean before connection to the driplines is made.

After installation the dripline must be commissioned by running the block for 6 hours and ensuring that no leaks or abnormalities are encountered.

Contractors must submit an electronic (AutoCAD and ArcGIS format) and hardcopy map of completed areas, as generated by the RTK GPS Control system in the local coordinate system. This map must show the actual drip lines inserted.

PPS 5 TRAINING OF PERSONNEL

The training of personnel of the Employer or User of the plant is required and shall be undertaken as described below.

The following categories of training has been allowed for

Training of semi-skilled operators.
Training of skilled operators and technical staff.
Guidance and operator assistance during the defect's liability period

PPS 5.1 Training of Semi Skilled Operators

Operators of the installed equipment shall, with the brief description specified be trained by the Contractor to safely operate the equipment and controls. This training shall not be in depth training and no advanced technical training shall be presented in this training session. This training is to include pump station operation and maintenance, irrigation setting up, and irrigation scheduling and the use of the Soil Moisture probes and software.

It is expected that training should include at least the following:
1 week of irrigator field operations (starting and stopping irrigation, block selection, monitoring and recording faults, diagnosis and rectification of problems);
1 week of pump operations

PPS 5.2 Training of Skilled Operators and technical staff

The training of skilled operators and technical staff shall take place with the full operational- and maintenance manual as specified at hand.

This training course shall include the training of technical personnel of the Employer during the installation period and commissioning stages of equipment on site to make the technical staff and or skilled operators completely conversant with the installed equipment and the use thereof.

It is expected that training should include at least the following:
2 days of system setting up, scheduling and moisture probe measurement for technical managers/supervisors.

PPS 5.3 Guidance and operator assistance during the defects liability period

If allowed for in the pricing schedule the Contractor is to provide a daily rate to provide guidance and operator assistance to the Clients personnel on site, during the Defects Liability Period. The daily rate is

solely for time spent providing on-site assistance and excludes travel time and costs to get to site. These costs are deemed inclusive within the daily rate provided.

PPS 5.4 General

Training provided by the Contractor shall be directly applicable to the actual equipment to be used at the installation. All training shall be carried out on site, unless otherwise requested by the Employer.

The Employer thus reserves the right to appoint certain staff to the Contractor's team during the installation and commissioning phase of the work for training as described in the previous paragraph.

The Employer will bear the cost of salaries, accommodation and other allowances and traveling expenses of its personnel, but all other expenses to allow the personnel to attend the said training shall be borne by the Contractor.

The Employer may also decide to request the Contractor to make use of the ability of the staff of the Employer to assist with physical installation and commissioning work, and in such instance the Engineer will instruct the Contractor accordingly.

The Tenderer shall if requested by the Engineer provide a training proposal, indicating the contractor's facilities and qualifications of the facilitator for the training to be offered.

The Tenderer shall provide all course material including manuals and training data in this case, and shall present well prepared lectures of the courses in locations which suite the Employer.

At conclusion of any training period, either for the operation and maintenance of equipment, or for advanced software and programming, the Contractor shall issue the necessary certificates at the end of the course and/or a signed statement to the effect that these training sessions were adequate.

If such training is specified in the Project Specifications, the Contractor shall price the items allowed for this purpose in the Schedule of Quantities / Pricing Schedule of the tender document.

PPS 6 INSPECTION AND TESTING

PPS 6.1 GENERAL

The equipment supplied under this Contract shall be subject to inspection by the Engineer or his Nominated Agent at all stages of manufacture.

The tests and commissioning procedure laid out below and such additional tests as the Engineer may reasonably require to prove compliance with the specification shall be carried out at the Contractor's Works and at site.

The Contractor shall give reasonable notice of time and place in writing to enable the Engineer to inspect and witness tests of materials and equipment. He shall provide the Engineer with facilities for witnessing

these tests and for any additional tests or inspection of any portion of the Works as required by the Engineer.

The Contractor shall at his own cost render all assistance and supply all labour appliances and any other materials the Engineer may require to check the setting out, measure up and inspect any portions of the Works at any stage during fabrication, construction, erection or painting. During such operations the Contractor shall, if required, suspend any or all of the Works without having claim for loss or damage as a result thereof.

The testing of the plant (or a part thereof) supplied under this Contract shall be carried out through its full operating range (or part thereof) as required by the Engineer.

All such tests and inspections and the necessary inspection facilities shall be provided at the Contractor's expense.

At the commencement of, and during the whole of Commissioning and Testing periods, the Contractor shall have available on site all essential spares and tools considered necessary to enable repair of defective parts to be carried out immediately, in the event of a breakdown.

The Contractor shall be responsible for the proper operation and maintenance of the plant throughout the period of the tests and until the operator training period is complete.

Acceptance by the Engineer of any plant item, following such inspection or tests, shall not relieve the contractor of any obligations under this Contract.

PPS 6.2 TESTING BEFORE DELIVERY

All items of plant will be subject to inspection at the manufacturer's works before despatch.

Materials, components and electric motors shall be tested for compliance with relevant British or South African standards and certificates submitted in triplicate.

Electrical equipment shall be subjected to appropriate insulation resistance tests, function tests and general inspection.

PPS 6.3 TESTING AT SITE

PPS 6.3.1 PPS Welds

Welds shall be tested as required by the relevant Code of Practice.

PPS 6.3.2 Pressure tests

Pressure tests shall be applied to each pipework system by filling it with water and applying a pressure of 1,5 times the operating pressure a specified in Clause 8.3 (c) for the particular system.

Systems shall be tested in sections to suit the overall contract programme and all pipework, which is to be concealed, shall be tested before it is concealed. Care shall be taken that no equipment items are over-stressed during pressure testing and components not suitable for the test pressure shall be by-passed or replaced with make-up pipe sections. The Contractor shall provide and fit all necessary temporary connections, blanks, make-up pieces and drains required for the tests and make good on completion of the tests.

The section of pipework to be tested shall be fully vented and primed and the pressure applied for at least 3 hours during which time the pipeline and fittings shall be inspected and any visible leaks recorded and repaired. Once all visible leaks have been repaired and no leaks are observed for a full 3hr pressure test, the pressure shall be held constant for a further 1-hour period, during which time the volume of water required to be pumped into the pipeline for maintenance of the pressure shall be measured. The volume shall not exceed that allowed in terms of Clause 7.3.3 of SABS 1200 L. This test shall be witnessed at the discretion of the Engineer. Welded joints shall be lightly hammered during testing.

On completion of the tests, water shall be drained rapidly out of the system to provide a flushing action. Any faults found during the test shall be rectified in an approved manner and the system shall be retested until no faults are found. When the Employer is satisfied with test results, an approval certificate will be issued.

Where the test pressure specified for individual items of equipment is less than the test pressure specified for the connecting pipe line the equipment shall be disconnected for the test and suitable makeup lengths of pipework or plugged connections shall be installed to enable the pipe line tests to be carried out.

Draining and Cleaning

On completion of the pressure test on a section of pipework, the water used for testing shall be drained away as quickly as possible to remove as much dirt and dross as possible. After completion of a pipework circuit, the circuit shall be flushed through to remove all pipe scale, dross and similar material.

The contractor shall provide all necessary connections, by-pass pipes, temporary strainers, temporary make-up pieces, to enable the systems to be drained and cleaned.

PPS 6.3.3 Alignment

Alignment checks of all driven machinery may be required and shall be witnessed by the Employer and the results recorded.

PPS 6.3.4 Controls

All automatic control functions, alarm and safety cut-out devises shall be tested by operational or simulated tests and set-points and calibrations set and their settings recorded, all in the presence of the Engineer.

PPS 6.3.5 Electrical Equipment

All electrical equipment installed under this Contract shall be tested in accordance with the requirements of the Local Authority and certificates of acceptance by the Authority obtained by the Contractor prior to electrical power being applied.

PPS 6.3.6 Performance Tests

Tests shall be carried out on all plant items to check that they are capable of their related performance.

The Engineer, or his nominated agent, shall witness each test and a signed certificate of approval shall be obtained from the Engineer upon completion of the tests to his satisfaction.

PPS 6.3.7 Tests on Completion

During completion of the balancing and commissioning of equipment the plant shall be brought into normal operation and the final adjustments of the equipment shall be made.

Thereafter the Tests on Completion in terms of the Conditions of Contract shall be carried out to ensure that the plant will fulfil the functions for which it has been designed.

Such tests shall include the following:

Simulated tests for all alarm and safety cut out equipment to prove the operation of the equipment.
Simulation tests on automatic controls to prove the ability of the controls to correct the conditions outside the required design parameters needs to be done by the Contractor. The tests shall be carried out by manually changing the desired values to produce an incorrect condition and then re-setting the controls to the design conditions and checking the operation of valves, etc, to restore the design conditions.

The Contractor shall provide all necessary temporary measuring and recording equipment. The equipment shall be of a type generally used for this type of testing and shall be to the approval of the Engineer. All instruments shall be accurately calibrated before the tests begin.

On completion of the whole of the tests and when the Contractor is satisfied that the entire plant is operating satisfactorily and will fulfil the function for which it has been supplied, he shall submit to the Engineer triplicate copies of all test records and charts together with reports on all the tests called for in this Specification.

The Engineer shall reserve the right to ask for any reasonable additional tests or for the repetition of previous tests in order to prove that the operation of the plant is satisfactory and in accordance with the Specification and Drawings.

PPS 6.3.8 Test Certificates

The Contractor shall provide three copies of test certificates for the installed pumps and materials and equipment specified for testing. Further copies are to be bound into the manuals to be supplied.

PPS 6.4 FILTRATION SYSTEM

Unless otherwise specified in the BOQ or drawings, filters housing, lid, and backwash are to be made of reinforce polyamide or reinforced polypropylene, disc elements are to be made of polypropylene or polyamide. Filtration should allow to be calibrated to function over pressure drop and have a self-cleaning mechanism.

PPS 6.5 FERTIGATION SYSTEM

Unless otherwise specified in the BOQ or drawings, the components of the fertigation system should have high resistance to chemical used in agriculture. It should have regulated chemical injectors which can be calibrated according to varying application. Fertilizer valves to be of at least 10 bar pressure rating.

Dosing pump to have mechanism to agitate additive and water, and be adjustable. Chemical filters to have a high range of pH tolerance, i.e. 3 – 13.

PPS 6.6 CLUSTER HOUSE

The cluster house shall have adequate space to house all components as detailed in the drawing, required for complete irrigation system operation and control. It shall be fenced to allow for natural ventilation, whilst still being covered and protected from all danger.

Cluster house will have large custom-made service doors and a standard single door for day-to-day operations and maintenance. An overhead gantry shall be installed above the heavy equipment's installation for ease of removal and loading.

Cable trenches shall be provided in the floor and shall be filled in with sand and shall be capped with a 50mm cement topping once cables have been laid and commissioned, while other cables shall be protected by hot dipped galvanised cable racking, complete as specified in the drawing. The cluster house floor slab shall be a minimum of 150 mm thick and cluster house will have 1.0m wide x 100 mm thick apron built around the outer edge of the building to facilitate rapid drainage of storm water.

Thrust support for the inlet and discharge manifolds shall be provide by an integrated reinforced concrete foundation and wall. The support concrete reinforced columns shall be high enough to provide the

required support. The palisade fence shall be constructed with material as specified in the detailed drawing.

PPS 6.7 IRRIGATION CONTROLLER SYSTEM

Unless otherwise specified in the BOQ or drawings, the components of the Irrigation Controller system should enable mobile and web remote control and have a precise EC and pH monitoring and monitoring.

It shall be integrated with a fertikit system, and have the capacity to control irrigation schedule for at least 10 valves during irrigation. It must be installed complete with a power line voltage variance or power surge protection, and an earthing kit for weather protection.

PPS 6.7.…Supply and installation of a suitable sized Irrigation Controller ….Unit – No

PPS 7 OPERATIONAL AND MAINTENANCE MANUALS

PPS 7.1 Scope

A minimum of three (3) complete sets in both hard and electronic format (or as scheduled in the Schedules of Quantities) of operational and maintenance manuals for all specified MCC'S and main- and sub-main switchboards and other specified systems (pump stations, irrigation etc.) shall be supplied for a project.

Operational manuals shall be submitted in two formats:-

The first format shall consist of a brief descriptive operating instruction (or manual) for the purpose of giving basic operating instructions to operators for installed equipment. This manual, consisting of a few pages, shall be brief and to the point and shall contain the data as specified.

The second format shall be the full and complete manual specified.

PPS 7.2 Brief Operating Instructions

These brief instruction sheets shall contain the following descriptions:

A basic description of the operation of all LV switchgear and control equipment in substations, motor control panels, distribution boards, UPS equipment, emergency power diesel generator sets, battery chargers, power factor correction equipment, etc. i.e. all proprietary assemblies, shall be provided to assist the user personnel of the Employer in the immediate "hands on" operation of the equipment of the Works.

The main incoming switch, fuse switch or circuit breaker of each LV board or control panel.
The functions and reading of instruments on each board or control panel.
The functions and meaning of each switch, control button and indicating lamp on the board or control panel.
The functions of local distribution circuit breakers, timers, etc. on the board.
The functions of motor protection circuit breakers of switch fuse units of motor starter panels
The functions and normal operating readings of instruments of each panel.
A general description of the function and basic operation field or control instrumentation external to the MCC'S or boards or panels, such as level sensing devices, flow sensing devices, pressure sensing devices, etc.

PPS 7.3 Detailed Operational and Descriptive Manual

This manual shall contain the detailed descriptions of all systems, switchgear and control equipment in motor control panels, distribution boards, UPS equipment, emergency power diesel generator sets, battery chargers, power factor correction equipment, etc. i.e. all proprietary assemblies, shall be provided to assist the user personnel of the Employer with advanced knowledge of the equipment for short, medium and long term maintenance- and operations of the plant and the works.

The descriptions must be complete in all respects and the Contractor shall also ensure that these manuals are prepared in such a manner that, in the opinion of the Engineer, a competent and qualified technician can trace any fault, identify any defective component, replace it with the correct spare part and follow, without difficulty, the exact function of every component.

To this end, care must be exercised to correlate the text with the layouts, circuit diagrams, etc. to relate the diagrams one with another and to provide a simple method of diagnosis and test to be used wherever breakdowns occur. The manuals shall also include block diagrams giving the layout of equipment as well as a description of the function and operation of every unit in the system.

The manuals shall be neatly prepared, in typewritten and/or printed format, indexed, with appropriate dividers between each section to facilitate ready reference. All documentation shall be presented in the English and Portuguese language.

The description shall, as a minimum requirement, include:

Operational and maintenance data and details of all assemblies or components of electrical equipment installed in the plant. Copies of operational manuals of manufacturers can be inserted in these descriptions.

In the case of insufficient descriptions in manuals of manufacturers, the Contractor shall provide additional descriptions to enable maintenance of the equipment.

The descriptions shall include:

Technical details of all equipment installed
A complete description of the operation of all equipment
A parts and spares list of every item of equipment together with a description of the item, the name, address and telephone number of the original supplier or wholesaler of the equipment
Brochures may be added as additional information but must not replace the data required
Complete equipment schematics, dimensional arrangement and layout drawings
All manufacturers handbooks having reference to the equipment
Installation test and alignment procedures
A comprehensive lubricating schedule covering all equipment supplied with full details of recommended lubricants, initial fill lubricants used, capacities and lubrication periods.
A comprehensive schedule of routine maintenance with timelines, for all equipment supplied
All circuit diagrams
All interconnection and inter cabling diagrams
Complete trouble shooting procedures and any other information deemed necessary to permit rapid and efficient maintenance of any part of the equipment by a qualified technician

The operating procedures contained in the manuals shall contain the following detailed features in fully descriptive format:

Operating Procedures

a) Pre start-up checks of all electrical equipment
b) Routine running attention
c) Stopping the plant
d) Prolonged shut-down of the plant
e) Re-commissioning of the plant after repairs, maintenance or prolonged shut-down

Maintenance

a) Routine maintenance procedures
   i) Description
   ii) Schedule
b) Preventative maintenance

Fault Finding Procedures

a) Supply faults
b) Main control faults
c) Investigation procedure for detection of motor starter faults and remedies:
   i) Symptom
   ii) Probable fault
   iii) Remedy
d) Investigation procedure for detection of auxiliary equipment faults and remedies:
   i) Symptom
   ii) Probable fault
   iii) Remedy

Safety Precautions

a) The nature of each hazard
b) The level of seriousness
c) How to avoid the hazard
d) The possible consequences of not avoiding the hazard

In the case of sealed assemblies or advanced assemblies of equipment that cannot be opened or maintained or repaired on site, the Contractor shall provide sufficient data and instructions for the replacement of the assembly and shall further describe the measures which the user or operator of the plant can follow to

operate the plant in an emergency and, if necessary, operate the plant manually, to overcome total shut-down or non-operation of the plant or Works until a new replacement can be installed.

The descriptions for temporary operational measures shall be of sufficient nature to enable interim safe operating conditions of the plant and shall further not be of a nature which shall cause damage to other parts or sections of the plant.

A schedule of every item of equipment in the plant or board together with a description of the item, part number, catalog number, etc., as well as the name, address and telephone number of the original supplier or wholesaler of the equipment.
Brochures may be added as additional information but must not replace the data required.
All as-built record drawings, including AC and DC schematic- and wiring diagram drawings for the equipment. The wiring diagrams shall contain all the terminal numbers and wire numbers of all wiring in the plant.
A4 drawings may be used in manuals but all text must be clearly legible. A3 drawing sizes are preferred.
Technical brochures and pamphlets of equipment as additional information. This shall, however, not serve for the fulfillment of clauses in par. (a) & (b) in “Detailed Operational Descriptions and Data”.
Routine and type test certificates issued by factories for all transformers and switchgear and all test data of cables, including OTDR testing data of fiber optic cable.(certificates shall indicate the instrument number as well as the calibration certificate number).
Copies of all Test Certificates.
Documents, information and charts providing a full record of the results of the Tests on Completion.

All calibration data of instrumentation. This data shall contain all set-point data for electronic motor protection relays, overload current settings, adjustable circuit breaker settings, flow and pressure instrument settings, level instrument settings, etc.

This data shall also contain all the embedded software, on disc or CD issued together with the instruments as part and parcel of the selling price of instruments where the instruments cannot be purchased without the embedded software.

PART A1 – BUSH CLEARING AND LAND PREPARATION

STANDARD SPECIFICATIONS FOR BUSH CLEARING AND LAND PREPARATION

The following SANS 1200 standard specifications are applicable;

SANS 1200 A : GENERAL

SANS 1200 C : SITE CLEARANCE

SANS 1200 D : EARTHWORKS

PG – BUSH CLEARING AND LAND PREPARATION - PROJECT SPECIFICATION

Project specifications for scheduled items – All rates submitted are to be fully priced. Inclusive of all costs, plus or together with overheads, profit and risks associated with the work as described below.

PG1 Includes setting up and removal on completion of camp, transport of plant, overheads, insurances, etc. required for the completion of the project but not measured elsewhere.
75% of the amount for site establishment will be paid on a time related basis over the projected time for the contract. The remaining 25% will be paid when the contract has been successfully completed and all plant, equipment and site establishment has been removed from site and the area has been reinstated in accordance with all environmental considerations, to the satisfaction of the Employer.

PG2.1 Category 1 Bush: Virgin and climax bush – includes ALL vegetation (unless specifically excluded). Must be disposed of in such a manner that there is no further cost to the employer.

PG2.2 Category 2 Bush: Secondary bush and intermittent (including trees not exceeding 2m in circumference) where no cultivation has taken place for about 10 years. Trees with circumference exceeding 2m [1,5 m from base of tree] are to be measured by the tenderer separately and quoted for under PG2.3. All material must be disposed of in such a manner that there is no further cost to the employer.

PG2.3 Category 3 Bush: Cultivated lands (within the last 10 years) where sparse bush/trees occur. Trees with circumference >2m [1,5m from base of tree] will be measured separately by the tenderer and quoted for per tree. Must be disposed of in such a manner that there is no further cost to the employer.

PG3 Root removal requirements are likely to be commensurate with the categories of bush described above. All roots are to be removed from the lands to be cultivated as per irrigation design and following the ripping operation. They must be disposed of in such a manner that there is no further cost to the employer.

PART A2 – ROADS - PROJECT SPECIFICATION

STANDARD SPECIFICATIONS FOR ROADS

The following SANS 1200 standard specifications are applicable;

SANS 1200 A : GENERAL

SANS 1200 C : SITE CLEARANCE

SANS 1200 D : EARTHWORKS

SANS 1200 DK : GABIONS AND PITCHING

SANS 1200 DM : ROADS

PF – ROADS - PROJECT SPECIFICATION

1.1 PF1 – Scope

This specification covers roads in rural areas, including earthworks and all ancillary works, for accessing construction sites.

1.2 PF2 – General

a. Gravel of a suitable quality is to be obtained from a borrow pit to be located in agreement with the local community. No additional payment will be made in connection with the obtaining of gravel or for overhaul. The Contractor must allow for removal and stockpiling of topsoil and reinstatement of the borrow area on completion of the contract. This will include shaping all slopes to be not steeper than 1(v):2(h). The Contractor will be required to spread previously stockpiled topsoil over the borrow area, but not to plant or seed with grass.

b. The Contractor is to ensure that drainage of the fields and roads is maintained, paying special attention to the vertical alignment of side drains so as to avoid ponding of water which may damage the road layers. No additional payment will be made for forming depressions in the road over which water can flow.

c. At all stages the Contractor will be responsible for ensuring that the materials he is working with are as near to Optimum Moisture Content as can be determined in the field and should expect to have to spread material to dry, or add water from a water-cart in order to obtain the required moisture content and compaction.

d. The Contractor will be required to do any setting-out or other survey work. Level and line control will be done by instrument as agreed between the Contractor and the Employer.

e. The Contractor will be required to supply road drawings, cross-sections and long-sections.

f. No materials testing will be required by the Contractor. The Employer reserves the right to carry out any test he may require at his own cost.

1.3 PF3 – Rates

a. The Contractor is to make himself fully aware of all the local conditions of the site and area and of what is expected in terms of type, quality, quantity, materials, borrow pits, water supplies, access, ground conditions, weather conditions, local regulations, public holidays, rates of pay, royalties and anything else that may affect his contract.

b. The Contractor will be provided with a drawing showing the proposed lay-out of the various roads to be constructed. These could be subject to change during the contract.

c. The Contractor should at all times assist the Employer to avoid any additional costs to the contract and will have no claim if any such problem or occurrence could reasonably have been avoided.

d. The tendered rate is to include for the complete construction of the road of the type stated including side drains.

e. The length will be measured, by means of a measuring wheel, tape measure or other agreed method, to the nearest 0,10m, along the centerline of the finished road. Where the road joins another it will be measured to the edge of carriageway (3.0m or 2.0m from centerline) of such road.

f. Payment will be made to the Contractor for the actual length of road of each type actually constructed. Interim payments will be made on the actual length of road constructed at the end of each month.

1.4 PF4 – Roads

PF4.1 – Access Roads, 6-m.

Access Roads will be required for the passage of plant and equipment transporting materials and accessing the site up to 35 tonne capacity. Such vehicular traffic is designed for surfaced and off road, and will require a road with a strong, free draining, non-slip surface 6.00 metres wide. The roads will be required to run from the specific site of the project to where they should join up with district roads maintained by the relevant Government Department.

– The surface over a width of 10.00 metres is to be cleared by removing all brush, grass, other vegetation, rubbish and all other objectionable material, including the disposal in a suitable area of all material resulting from the clearing.

– If topsoil is found this is to be removed by blading into the adjacent fields.

– The road-bed is to be shaped to approximately a 4% camber and irregularities in the long section of the road are to be removed to give an acceptable vertical alignment.

– The road bed is to be scarified to a depth of 150 mm over the full width covered by the road prism (allowing a 4% fall on each side of the centreline).

– The road-bed is to be rolled with not less than 8 passes of a suitable grid or vibratory roller to

attain a compaction of not less than 93% of modified AASHTO density.

– Side drains as shown on the typical cross section are to be formed on either side and the material brought on to the road bed and shaped. A compacted layer thickness of 150 mm is to be obtained

– Gravel from an approved borrow-pit is to be dumped on the road such that the finished layer thickness is not less than 150 mm over the full finished width of 6.00 m. Thickness control may be made by calculation of the dumping spacing of the trucks, but consideration must be made for compaction factors and wastage of material. Random test holes will be made in the finished layer to confirm that the required thickness is being maintained.

- Using the methodology described above, a 150mm thick gravel base layer compacted to 95% of modified AASHTO density (minimum 8 passes of a suitable roller) is to be constructed.

– Using the same methodology described above, a 150mm thick gravel wearing course compacted to 95% of modified AASHTO density (minimum 8 passes of a suitable roller) is to be constructed. The finished surface is to be smooth and even.

PF4.2 – Four Meter Wide Gravel Roads.

Gravel infield roads will be required for hauling cane from the fields to the loading areas by means of tractor and trailer. In order that these roads can be used in all weather conditions, they will need a non-skid gravel surface. They also need to be sufficiently strong and well drained so as not to deform significantly under the load of the tractor and trailer. They will typically have a gravel surface 4.00 metres wide.

– Gravel infield roads are to be constructed in the same manner as the Access Roads, but with the following differences.

– The overall width to be cleared will be 8.00 m.

– The road will have a 4% cross-fall to one side only, normally to the up-hill side, i.e. against the slope of the land.

– The long section of the road will not have to be to as high a standard as for the Main Haulage Road.

– A side drain will normally be required on one side only, but sufficient material must be obtained from the excavation of the drain to form a 150 mm thick layer of compacted material above original ground level.

– The finished gravel surface of the road is to be not less than 4.00 metres wide.

PF4.3 – Upgraded Farm Roads (Earth roads).

These will consist of the existing farm roads formed at the time of laying out the fields and the perimeter road. They will be used by tractors and trailers when harvesting the cane, but due to their low usage it will not be necessary to gravel them. They will be 6.00 m wide.

– The surface over a width of 8.00 metres is to be skimmed with a grader to remove all grass, roots and any other organic matter. This is to be disposed of in a suitable area.

– If topsoil is found this is to be removed by grading into the adjacent fields.

– The road-bed is to be shaped to approximately a 4% camber or cross-fall and local irregularities in the road are to be removed to give an acceptable vertical alignment.

– The road-bed is to be rolled with not less than 8 passes of a suitable grid or vibrating roller.

– Side drains as shown on the cross section are to be formed on one side of the road.

– The finished road is to be skimmed with a grader to give a smooth even finish to the surface.

PART B: VARIATIONS AND ADDITIONS TO THE STANDARDISED SPECIFICATIONS

PART B: VARIATIONS AND ADDITIONS TO THE STANDARDISED SPECIFICATIONS

Preamble

This portion of the Project Specification deals with matters relating to the Standardised Specifications and shall be read in conjunction with the SANS 1200: Standardised Specifications for Civil Engineering Construction.

All clauses in this portion of the Project Specification shall be deemed to supplement the Standardised Specification, unless it is clear from the context that it replaces a section, a clause or a part of a clause of the Standardised Specifications.
The drawings issued with this Document show the general nature and extent of the work envisaged. The drawings issued with this Document are the Tender drawings. The drawings are subject to revision as the Engineer may deem necessary.
The Standardised Specifications and drawings forming part of the Contract have been drawn up to cover all phases of work usually encountered in projects of this nature and they may therefore cover items of work not encountered in this particular Contract, which items shall be ignored.

SANS 1200A: GENERAL
PSA 1 MATERIALS
PSA 1.1 Quality (sub-clause 3.1)
Add the following:
All materials are to be the best of their respective kinds, new, undamaged, sound and free from defects and shall comply with the relevant clauses of the Specification.
All references to Standard Specifications are to the latest amendment to such specifications.
Materials bearing the SANS or BS mark will not be subjected to tests to determine whether they comply with the relevant specifications. The Engineer may in his discretion require any material not bearing such a mark to be tested in accordance with the relevant specifications; should he do so the Contractor shall arrange for such tests to be carried out at the Contractor's cost by the South African Bureau of Standards or other approved body.
Whether or not the material bears the mark or is tested, any material found not to be in accordance with the specification will be rejected and replaced by the Contractor at his own cost.
Contractors may be required, at their own expense to submit samples of the material offered to the Engineer for his approval and the material supplied under this contract shall be of a standard equal to that of the samples so submitted and approved. Samples will remain the property of the Contractors, who shall remove them when called upon to do so by the Engineer.
PSA 1.2 Add the following new sub-clause
3.3 Delay due to Supply of Materials
The Contractor shall ensure that the work is not delayed due to the lack of materials on the site of the works, by placing orders in good time with suppliers for the materials required.
The Contractor shall, by producing copies of written orders or written enquiries for suppliers, prove to the satisfaction of the Engineer that any delay occasioned by non-availability of materials has been caused by the inability of suppliers to supply and not by his own lack of timely ordering or lack of exhaustive enquiry for supplies, before any extensions of the contract time will be allowed due to such delays.

PSA 2 PLANT
PSA 2.1 Add the following new sub-clause
4.3 Construction Plant
Construction plant shall be of a suitable type for carrying out the work for which it is required. Its capacity shall be sufficient to meet the requirements of the work within the contract time. It shall be kept at all times in full working order and repair. If the Engineer considers that the plant in use is in any way

inefficient or is inadequate in capacity, he shall have the right to call upon the Contractor to provide such additional plant or equipment as may be required to meet the needs of the Works.

PSA 2.2 Contractor's offices, stores and services

Add the following paragraph before the existing first paragraph in sub-clause 4.2:

"The Contractor's buildings, sheds and other facilities erected or utilised on the Site for the purposes of the Contract shall be fenced off and shall contain all offices, stores, workshops, testing laboratories, toilet facilities, etc. as may be required by the Contractor. The facilities shall always be kept in a neat and orderly condition.

No personnel may reside on the Site. Only night-watchmen may be on the Site after hours."

Delete "and first-aid services" *in the second paragraph of sub-clause 4.2 and add the following:*

"The Contractor shall provide on the Site and in close proximity to the actual locations where the work is being executed, one toilet per 10 workmen, which toilets shall be effectively screened from public view and their use enforced. Such toilets shall be relocated from time to time as the location of the work being executed changes, so as to ensure that easy access to the toilets is maintained.

The Contractor shall, where applicable, make all necessary arrangements and pay for the removal of night soil."

PSA 3 CONSTRUCTION

PSA 3.1 Watching, Barricading, Lighting and Traffic Crossings (sub-clause 5.2)

Add the following:

The Contractor shall be responsible for the protection of persons, animals, vehicles and property from injury or damage by reason of the works, and shall employ competent watchmen and guard the works both by day and by night.

The Contractor shall provide, erect and maintain adequate warning signs, fences, barricades, guard rails, temporary bridges and other protective measures as may be necessary from time to time to the approval and satisfaction of the Engineer.

Where excavations require barricading, this shall be done by means of at least three 18mm diameter hemp ropes or No. 8 SWG wires stretched tightly between suitable supports along both sides and ends of the excavation at approximately 500mm, 800mm and 1 200mm above the ground.
The support shall consist of poles or iron standards securely planted in solid ground so as to enclose the spoil from the excavations and shall be not more than 15m apart. White -washed panels or red flags measuring at least 300mm x 300mm shall be attached between the upper and middle strands at the ends of excavations and along the length of the barricades at distances not exceeding 15 meters.
Where vehicular or pedestrian crossing is required over an open excavation, it shall be protected on either side by a stout two rail timber fence at least 1 000mm high, consisting of 150mm x 75mm deal verticals set 600mm into the ground with 75mm x 50mm rails securely nailed to them. Where deals or boards are used as bridges, they must be battened underneath to prevent tipping.
Lamps in good order and continuously lit from dusk to dawn shall be provided to clearly define all excavations which, in the opinion of the Engineer constitute a hazard; generally the spacing of these shall not exceed 15 meters, and in addition at least four lamps shall be provided at each temporary crossing.
All poles and warning notices shall be clearly marked by means of an approved reflecting material.

PSA 3.2 Protection of Overhead and Underground Services (Sub-clause 5.4)

Add the following:
All services, in particular cables, shall be treated as live until proven otherwise.
Before the commencement of any excavation the Contractor shall confirm the name and telephone number of the relevant officials directly concerned with the known or suspected services and shall acquaint himself with the position of the control points of the services and shall have readily available equipment necessary to shut off and isolate any such service. The Contractor shall liaise with the relevant authorities or controlling bodies for the necessary temporary closure of any services during construction. A meeting to discuss and confirm the accommodation and protection of services will be arranged before construction commences.
The Contractor shall not commence work in any area until proper arrangements have been made for supervision of the work by the relevant authority.
Before commencing any excavation for trenches or road works in a specific area, the Contractor shall locate all existing services with the co-operation of the relevant authority, carefully excavate by hand and expose and survey such services. If the information regarding any existing service given in the drawings is either missing, incomplete or erroneous, the Contractor shall, as soon as the service has been located, submit details of the exact location, depth and type of service in writing to the Engineer.
Before any work that involves services to any property is carried out, the Contractor shall serve notice on the resident, occupier and / or owner of every property, at least 3 working days in advance of any temporary disconnection, advising the nature, time and duration.
The Contractor shall deal with the crossing of known existing services by the pipelines by:

a) Notifying the Engineer's Representative and the relevant authority 48 hours prior to executing the work.
b) Serving notice on the resident, occupier and / or owner of every property affected at least 36 hours in advance of any temporary disconnection, advising the nature, time and duration.

c) Excavating by hand, under the supervision of the Engineer's Representative and / or the authority involved, on the line of the trench up to 2 m, or such distance as may be necessary, in both directions from the indicated position of the services.

Before any excavations take place near electrical cable routes, the Contractor shall ensure that wayleaves from the Eswatini Electricity Company have been obtained on his behalf by the Consultant.

Eswatini Electricity Company and Eswatini Posts and Telecommunications insist that no mechanical excavators or vibratory compaction equipment be used within 3 m of their services. Notice must be given at least 2 working days in advance of any work close to their services.

After the site has been handed over, the Contractor shall ascertain the names and telephone numbers of persons to be contacted at each service authority in the case of damage to services. These numbers shall be prominently displayed in the Contractor's site office, preferably near the telephone or radio, before the first payment certificate will be issued.

When damage to an existing service occurs, the Contractor shall immediately contact the relevant service authority after which he shall notify the Engineer or his representative who will investigate the matter and determine liability of the damage.

The accuracy and completeness of existing service information shown on the design drawings have not been confirmed. The Contractor will therefore be required to proceed with extreme caution in order to avoid damage to existing services.

In general the Contractor may be called upon by the Engineer to expose and locate the exact position of services for the purpose of avoiding damage or for the service authority to establish the necessity for relocation.

The Contractor may also be called upon to re-excavate and backfill trenches previously excavated and backfilled by others where in the opinion of the Engineer such work is necessary to ensure the stability of any other works over such trenches. This action in no way relieves the Contractor of his responsibility in terms of the specified works.

PSA 4 TESTING

PSA 4.1 Approved Laboratories

The contractor shall employ an approved commercial laboratory to conduct the required tests.

No additional payment shall be made for tests as prescribed in the relevant sections of SANS 1200 series.

PSA 5 MEASUREMENT AND PAYMENT

PSA 5.1 Facilities for Engineer (sub-clause 8.3.2.1)

Add the following sub-items:

(d) Furnished office Unit.....Unit:.....Sum:

The sum shall cover the costs of providing the office unit as directed in **PSAB 3.2.3**

(e) Car ports (number stated).....Unit:.....Sum:

The sum shall cover the costs of providing the car port(s) as described in PSAB 2.2.4.

(f) Survey equipment.....Unit:.....Sum:

PSA 5.2 Facility for the Engineer (sub-clause 8.4.2.1)

Add the following sub-items :

(d) Furnished office Unit.....Unit...Sum:

The sum shall cover the costs of maintaining the office unit as described in **PSAB 3.2.3**
(e) Car ports (number stated).....Unit:.....Sum:
The sum shall cover the costs of maintaining the car port(s) as described in PSAB 2.2.4.
(f) Survey equipment.....Unit:.....Sum:

PSA 5.3 Sums Stated Provisionally by Engineer (sub-clause 8.5)
A provisional sum is allowed for testing of soils and materials by the Engineer, and the cost of transporting samples to the testing laboratory and supply of a certified copy of test results.
It should be noted that this is extra to the general testing of materials in accordance with clause 7 of the standardized specifications, for which the Contractor is solely responsible, and the cost of which is included in the scheduled rates.
(a) Testing of materials by approved independent laboratory results. Unit:.....Prov. Sum.....
(b) Contractor's overheads, charges and profit on item (a) Unit.....%.....
The Contractor shall be reimbursed the sum or sums actually paid by him in connection with the provision of laboratory equipment, services, maintenance and special testing (on production of receipts, statements, vouchers, etc.) and this sum or sums shall be increased by the percentage tendered as mark-up for overheads, administration charges and profit.

A provisional sum is allowed for survey required by the Engineer, and shall include traveling expenses, consumables and incidental costs, and supply of a certified copy of the survey
<u>Survey ordered by the Engineer</u>
(a) Survey by approved surveyor.....Unit:.....Prov. Sum:.....
(b) Contractor's overheads, charges and profit on item (a) ……Unit:.....%.....
The Contractor shall be reimbursed the sum or sums actually paid by him in connection with having the survey work carried out, and this sum or sums shall be increased by the percentage tendered as mark-up for overheads, administration charges and profit.

PSA 5.4 PAYMENT

PSA 5.4.1 Fixed-charge and value-related items

Replace the contents of sub-clause 8.2.1 with the following:

PSA 5.4.1.1 Fixed-charge items

"Payment of fixed charges in respect of item 8.3.1 will be made as follows:

(a) EIGHTY PER CENT (80%) of the sum tendered will be paid when the facilities have been provided and approved;

(b) The remaining TWENTY PER CENT (20%) will be paid when the works have been completed, the facilities have been removed and the site of the Contractor's establishment has been cleared and cleaned to the satisfaction of the Engineer.

No adjustment will be made to the sum tendered in respect of item 8.3.1 should the value of the works finally executed or the time for completion vary in any way from that specified in the tender.

PSA 5.4.1.2 Value-related items

Payment for the sum tendered under item 8.3.2 will be made in three separate instalments as follows:

(a) The first instalment, which is 40% of the sum, will be paid when the Contractor has fulfilled all his obligations to date under this specification, the General Conditions of Contract and the Particular Conditions, and when the value of work certified for payment, excluding materials on site and payments for preliminary and general items, is equal to not less than 5% of the total value of the work listed in the Schedule of Quantities.

(b) The second instalment, which is 40% of the sum, will be made when the amount certified for payment, including retention moneys but excluding this second instalment, exceeds 50% of the tender sum.

(c) The final payment, which is 20% of the sum, will be made when the works have been certified as completed and the Contractor has fulfilled all his obligations to date under this Specification, the General Conditions of Contract and the Particular Conditions.

Should the value of the measured work finally completed be more or less than the tender sum, the sum tendered under item 8.3.2 will be adjusted up or down in accordance with the provisions of Sub-Clause 12.3 of the Conditions of Contract, and this adjustment will be applied to the third instalment."

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PSA 5.4.2 Time-related items

Replace the contents of sub-clause 8.2.2 with the following:

"Subject to the provisions of sub-clauses 8.2.3 and 8.2.4, payment under item 8.4.1 (time-related item) will be made monthly in equal amounts, calculated by dividing the sum tendered for the item by the tendered Contract period in months, provided always that the total of the monthly amounts so paid for the item is not out of proportion to the value of the progress of the Works as a whole."

PSA 5.5 SAFETY

Replace the contents of sub-clause 5.5 with the following:

"Pursuant to the provisions of the Conditions of Contract, and without in any way limiting the Contractor's obligations thereunder, the Contractor shall at his own expense (except only where specific provision (if any) is made in the Contract for the reimbursement to the Contractor in respect of particular items), provide the following:

(a) Provide to its Employees on the site of the works, all safety materials, clothing and equipment necessary to ensure full compliance with the provisions of the occupational health and safety legislation and regulations at all times, and shall institute appropriate and effective measures to ensure the proper usage of such safety materials, clothing and equipment at all times;

(b) Provide, install and maintain all barricades, safety signage and other measures to ensure the safety of workmen and all persons in, on and around the site, as well as the general public;

(c) Implement on the site of the works, such procedures and systems and keep all records as may be required to ensure compliance with the requirements of the PSA 5.5(a) at all times;

(d) Implement all necessary measures so as to ensure compliance with the PSA 5.5(a) by all subcontractors engaged by the Contractor and their employees engaged on the works;

(e) Full compliance with all other requirements pertaining to safety as may be specified in the Contract.

The Employer and the Engineer shall be entitled, although not obliged, to make such inspections on the site as they shall deem appropriate, for the purpose of verifying the Contractor's compliance with the requirements of the PSA 5.5(a). For this purpose, the Contractor shall grant full access to the site of all parts of the site and shall co-operate fully in such inspections and shall make available for inspection all such documents and records as the Employer's and/or Engineer's representative may reasonably require.

Where any such investigations reveal, or where it comes to the Engineer's attention that the Contractor is in any way in breach of the requirements of the PSA 5.5(a) or is failing to comply with the provisions of this clause, the Engineer shall, in accordance with the provisions of Sub-Clauses 8.8 to 8.12 of the Conditions of Contract, be entitled to suspend progress on the works or any part thereof until such time as the Contractor has demonstrated to the satisfaction of the Engineer, that such breach has been rectified.

The Contractor shall have no grounds for a claim against the Employer for extension of time and/or additional costs if the progress on the works or any part thereof is suspended by the Engineer in terms of this clause, and the Contractor shall remain fully liable in respect of the payment of penalties for late completion in accordance with the provisions of Sub-Clause 8.7 of the Conditions of Contract should the Contractor fail to complete the Works on or before the specified due completion date in consequence of the suspension.

Persistent and repeated breach by the Contractor of the requirements of the PSA 5.5(a) and/or this clause shall constitute grounds for the Engineer to act in terms of Sub-Clause 15.2(b) of the Conditions of Contract and for the Employer to cancel the Contract in accordance with the further provisions of the said Clause 15."

SANS 1200 AB **ENGINEER'S OFFICE**

PSAB 1 INTERPRETATIONS

PSAB 1.1 Definitions (sub-clause 2.3)

Add the following definitions:

Car Port: A shelter for a car, constructed on site.
Survey equipment: Equipment to conduct all necessary survey work.

PSAB 2 MATERIALS

PSAB 2.1 Name Boards (sub-clause 3.1)

Replace with:

The contractor shall supply, erect where directed, maintain and remove on completion one (1) double sided project name board of substantial construction, approximately $8m^2$, with project description, and names of the Employer, Engineer, Funder and Contractor painted on it.

PSAB 2.2 OFFICE BUILDING(S) (sub-clause 3.2)

Delete this sub-clause entirely and re-title the sub-clause "FACILITIES FOR ENGINEER".

Add the following sub-clauses:

2.2.1 Office Buildings

The Contractor shall provide, furnish and equip one or more offices (as scheduled) for the use of the Engineer.

Buildings for offices shall be constructed of timber, asbestos or other approved materials. The buildings shall have double walls filled with insulating material and lined on the inside with timber or other approved material.

Ceilings shall be provided and offices shall have timber or concrete floors.

Office buildings shall be painted with an approved paint after erection and the paintwork shall be maintained during the contract period.

Each door shall be provided with a lock and two keys.

The siting of all offices shall be to the Engineer's satisfaction and shall be decided upon in consultation with him and confirmed in writing before erection.

All accommodation shall include the provision of a constant 220 volt A.C. electric supply, access road where required, fresh clean portable water and sewerage, including septic tanks or a portable toilet which will be considered as part and parcel of the accommodation provided and will not be paid for separately.

All accommodation shall meet with the approval of the Engineer.
The offices shall comply with the following requirements:

Minimum floor area:	12m²
Minimum window area:	2,4m²
Minimum window area opening:	1,5m²
Minimum clear height:	2,4m

2.2.2 Office Furniture

Each office shall be equipped with the following:

(i) Office desk with surface area of at least 1.5m^2 with at least 3 drawers one of which can be locked;
(ii) General purpose steel cabinet with doors, lock and two keys with at least 1.5m^2 shelf area and a volume of 0,7m^3;
(iii) Two office chairs;
(iv) Sufficient racks and hangers for hanging contract drawings. The hangers shall be of the "Barhold" type, with one hanger to five drawings;
(v) Double 80 watt fluorescent light fittings complete with ballast and tubes;
(vi) Drawing table with a smooth flat top having an area of at least 3m^2;
(vii) One draughtsman's stool fitted with a padded seat with adjustable seat height;
(viii) One 220/250 volt 15 amp power point;
(ix) Windows shall be fitted with Venetian or opaque roller blinds.

The Contractor shall also supply an office complete with a conference table large enough to accommodate twelve people and with an area of at least 4m². The table can be made up of smaller tables if the top surfaces are at the same level within 5mm. Ten office chairs shall also be supplied.

2.2.3 Ablution Facilities

The Contractor shall also provide ablution facilities for the exclusive use of the Engineer. The facilities shall be complete with a toilet of the flush type, complete with sewer reticulation and/or septic/conservancy tanks. The room shall also be equipped with a hand washbasin complete with taps and drain, a towel rail and electric lighting.
On completion of the Works, ownership of the buildings, and furnishings and shall revert to the Contractor who shall remove them from the Site.

2.2.4 Car Ports

The Contractor shall provide car ports adjacent to the offices as directed by the Engineer.
Car ports shall be so constructed and positioned that the vehicles parked under them will at all times be protected against the direct rays of the sun. The carports shall be at least 27.5m² in area and the floors shall consist of a layer of broken stone to alleviate dusty muddy conditions.
The Contractor shall maintain the carports in good condition throughout the contract period.
Upon completion of the whole of the Works, the ownership of the carports shall revert to the Contractor who shall remove them from the site.

PSAB 3 PLANT

PSAB 3.1 Telephone (sub-clause 4.1)

Add the following:

If so instructed by the Engineer, a fixed line telephone shall not be supplied. The Contractor shall supply the Engineer with a cellphone for the duration of the Contract inclusive of the rental, insurance and call costs. The Contractor shall also supply facsimile facilities as specified by the Engineer.

PSAB 3.2 Survey Equipment

The contractor shall provide the following survey equipment on the site for the use of the Engineer from the commencement to the completion of the works.

Survey equipment as listed below:

- 1 theodolite capable of reading to 20 seconds of arc;
- 1 automatic Engineer's level with tripod;
- One 5m levelling staff
- One staff angle bubble;
- One 25m Stilon tape;
- One metal change point for leveling;
- One 100m Stilon tape;
- Six ranging rods, each of 2.5m long;
- Steel and wooden pegs and hammer as required.

The theodolite may be shared by arrangement between the Contractor and the Engineer, but the remaining instruments shall be provided for the exclusive use of the Engineer. The Contractor shall keep the equipment continuously insured against any loss, damage, or breakage and he shall indemnify the Engineer and Employer against any claims in this regard.

Upon completion of the works, the survey equipment as listed above shall revert to the contractor.

PSAB 4 CONSTRUCTION

PSAB 4.1 Survey Assistants (sub-clause 5.5)

Delete this Sub-clause and substitute with:

The Contractor shall make available to the Engineer on a full-time basis a suitably trained and approved survey assistant and labourers necessary to assist the Engineer in carrying out survey work, setting out and measurement of the Works. The survey assistant and labourers may be used by the Contractor if and when the Engineer indicates. The Contractor shall supply all pegs and concrete necessary for the setting out of the work. The wages of the survey assistant and labourers shall be paid by the Contractor.

SANS 1200C **SITE CLEARANCE**

PSC 1 MATERIALS

PSC.1.1 Disposal of Materials (sub-clause 3.1*)*

Add the following:

All unsuitable excavated material which cannot be spread on the site must be spoiled. Refer to **PSDM2.3.**

Vegetation removed under site clearance, as an alternative to carting and dumping, may be burned under controlled conditions along some sections of the road, provided that there are no residences in the immediate vicinity, and where the smoke will not be likely to present hazard to traffic or pedestrians.

Concrete removed from demolishing the existing buildings on the site should be spoiled at a suitable place identified by the contractor and approved by the Engineer.

The Contractor shall be solely responsible for observing the municipal bylaws and regulations concerning burning, and shall indemnify the Employer and Engineer against all claims for damages arising from such actions.

PSC 2 CONSTRUCTION

PSC 2.1 Areas to be cleared and Grubbed (sub-clause 5.1)

Add the following:

The following areas are to be cleared and grubbed:

(a) The Contractor's construction camp site;

(b) designated areas for the structures to be constructed;

(c) Routes for water pipelines not cleared as part of the works shall be cleared of vegetation for a width of 1.5 metres on both sides of the pipe centerline.

Where working width is restricted by proximity to existing structures or other physical obstacles, the Engineer will designate locations for stockpiling of excavated material.

PSC 2.2 Individual Trees and Other Plants (sub-clause 5.2.3.2)

Add the following:

Where trees and plants are designated for preservation, the following penalties will be levied for damage caused to them by the Contractor:

E 300 per tree;

E2 500 per tree fern (Cyatheaceae) or protected species;

E5 000 per cycad (Zamiaceae)

PSC 2.3 Conservation of Topsoil (sub-clause 5.6)

Add the following:

Where indicated by the Engineer topsoil shall be removed to a depth ordered by the Engineer and stockpiled in a position involving a haul not exceeding 1 km (free haul) to be designated by the Engineer.

PSC 2.4 Landscaping Preservation and Conservation of Flora (sub-clause 5.7)

Add the following:

A penalty of E5 000 per hectare or part thereof shall be levied for areas of general habitat and flora within designated areas that are damaged by the Contractor

PSC 2.5 Removal and Reinstatement of Fences

Where an existing fence has to be removed temporarily during construction, a temporary fence is to be erected to close the gap. The fence shall thereafter be reinstated to a condition comparable with the original.

PSC 3 MEASUREMENT AND PAYMENT

PSC 3.1 Basic Principles (sub-clause 8.1)

Add the following:

The Contractor shall make his own arrangements for spoiling material and his tendered rates for the various items shall include for all transport costs, tipping charges, etc.

PSC 3.2 Scheduled Items (sub-clause 8.2)

PSC 3.2.1 Remove Topsoil to Nominal Depth of 150mm and Stockpile (sub-clause 8.2.10)

Amend the description:

Remove topsoil to depth ordered by the Engineer and stockpile.

PSC 3.3 Scheduled Items (sub-clause 8.2)

PSC 3.3.1 Demolition, removal and disposal of Structures and Pipeline (sub-clause 8.2.8)

Add the following:

Where the Contractor is directed to demolish structures and pipelines, the Contractor shall provide a Method statement for the approval of the Engineer. Entering upon the premises for the purpose of the demolition shall not commence before the Contractor has received a release form, duly authorized by representative of the Engineer, in which any special conditions applicable to the demolition are documented.

SANS 1200 D **EARTHWORKS**

PSD 1 MATERIALS

PSD 1.1 Method of Classifying (sub-clause 3.1.1)

After the first paragraph add:

Inspection of the material for any classification other than soft excavation shall be undertaken by the Engineer prior to any excavation. Levels of the occurrence of intermediate and hard rock excavation shall be measured and agreed, recorded and signed by both the Engineer and the Contractor before commencement of intermediate or hard rock excavation.

PSD 1.2 Classes of Excavation (sub-clause 3.1.2)

Notwithstanding the provisions of this sub-clause or anything to the contrary in these Specifications or the Schedule of Quantities, Boulder Excavation Class A and Class B shall be classified as Intermediate Material, with the provision that boulders requiring drilling and blasting in order to be removed or loaded as specified in sub-clauses 3.1.2(a)(1) and (2) will be measured separately as Hard Rock Excavation.

PSD 1.3. Material Suitable for Embankments and Terraces (sub-clause 3.2.1)

Add the following:

The material shall be G5 material compacted in 150mm layers to 95% mod AASHTO density

PSD 1.4 Material Suitable for Replacing Over break in Excavations for Foundations (sub-clause 3.2.2)

Add the following:

The material shall be compacted in 150mm layers to 95% mod AASHTO density

PSD 1.5 General [Selection] (sub-clause 3.3.1)

Add the following:

The Contractor will be required to preserve topsoil considered by the Engineer to be suitable and shall stockpile it in areas designated by the Engineer for subsequent use. Measurement and payment for stockpiling of topsoil shall be in accordance with the provisions of Clause 8.2.10 of SANS 1200C and Clause PSC 8.2.10.

PSD 2 CONSTRUCTION

PSD 2.1 Explosives (sub-clause 5.1.1.3)

Add the following:

The contractor shall not carry out blasting within 8m of any existing pipeline, or within 12m of any building or structure. Should rock be encountered within either of these situations, excavation by on explosive means will be required.

The contractor shall comply fully with local regulations covering the use of explosives and shall only employ blasters certified by the Inspector of Mines.

PSD 2.2 Negligence (sub-clause 5.1.2.4)

Add the following:

Any damage arising from negligence by the Contractor shall be made good at his cost to the satisfaction of the Engineer and/or the Authority concerned.

PSD 2.3 Methods and Procedures (sub-clause 5.2)

PSD 2.3.1 Disposal (sub-clause 5.2.2.3)

Add the following:

Unsuitable and surplus excavated material shall be disposed of on sites designated or approved by the Engineer.

PSD 2.3.2 Top soiling (sub-clause 5.2.4.2)

Delete the last full stop and add the following "or such greater depth as called for in the Schedule of Quantities or directed by the Engineer".

PSD 2.3.3 Finishing (sub-clause 5.2.4)

Add the following new sub-clause:

5.2.4.6 Final finishing and clearing up

After completion of construction, including backfilling of trenches and structures, the site shall be cleaned of all loose stones, waste material, rubble and debris resulting from the operations of the Contractor.

Drainage structures shall be cleared of debris, soil, silt and other material.

The slopes of cuttings and fills shall be trimmed to neat uniform slopes and the entire site left in a neat and workmanlike condition.

All temporary deviations shall be ripped and leveled off with the original ground surface in such a way that soil erosion is prevented.

The Contractor shall take care not to damage existing works during finishing and clearing up operations. Any damage to services and existing structures caused by Contractor's final finishing and clearing up operations shall be repaired by the Contractor at his own cost to the satisfaction of the Engineer.

PSD 3 MEASUREMENT AND PAYMENT

PSD 3.1 Basic Principles (sub-clause 8.1)

Add the following sub clause:

8.1.4 The Contractor shall note that no designated spoil sites are available in the area. The Contractor shall make his own arrangements for spoiling material and his tendered rates for the various items shall include for all transport costs, tipping charges, etc.

PSD 3.2 Computation of Quantities (sub-clause 8.2.2)

The second paragraph "Where this method ……. boulder material" *shall be deleted.*

PSD 3.3 Scheduled Items

PSD 3.3.1 Overhaul (sub-clause 8.3.6)

Note that no overhaul will be paid on material carted to spoil.

Environmental, Social, Health and Safety Requirements

Eswatini Water and Agricultural Development Enterprise (EWADE)

BUSH CLEARING, LAND PREPARATION, SUPPLY AND INSTALLATION OF IRRIGATION SYSTEM, TESTING AND COMMISSIONING OF 10 HA AT DINABANYE CHIEFDOM UNDER THE MATSANJENI SOUTH INKHUNDLA

ENVIRONMENTAL AND HEALTH AND SAFETY SPECIFICATION

February 2025

ENVIRONMENTAL AND HEALTH AND SAFETY SPECIFICATION

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LIST OF ACRONYMS AND ABBREVIATIONS

CMP	-	Comprehensive Mitigation Plan
EM	-	Environmental Monitor
EMO	-	Environmental Monitoring Officer
EMP	-	Environmental Management Plan
EPO	-	Environmental Performance Objective
ESIA	-	Environmental and Social Impact Assessment
LUSIP II	-	Lower Usuthu Smallholder Irrigation Project Phase II
EEA	-	Eswatini Environmental Authority
EWADE	-	Eswatini Water and Agricultural Development Enterprise Limited

PART 1 PREAMBLE

INTRODUCTION

a) This document describes in detail the environmental specifications which must be met by bidders for the development of on-farm activities for the Lower Usuthu Smallholder Irrigation Project Phase II (LUSIP II). Construction components of the project comprise bush clearing/land preparation and earthworks and irrigation works for:

Irrigation Infrastructure at Dinabanye Chiefdom under the Matsanjeni South Inkhundla

The document will form part of the Project Specifications for each specific contract tendered under the overall project.

Part 1 provides background information for the tenderer. Part 2 contains the detailed contractual specifications for environmental management of the construction projects which will provide for prevention and avoidance of specific impacts at the construction sites, as well as those away from the site(s) but caused by site-specific construction activities. Part 3 contains the health and safety specification to which the contractor should consider during construction.

COMPREHENSIVE MITIGATION PLAN

The environmental and social issues of the LUSIP II have been studied and assessed in several documents, including a feasibility study, an environmental and social impact assessment (ESIA), an environmental and social management plan (ESMP) and a series of appraisal reports. These have dealt with the impacts of the LUSIP II in a comprehensive and regional context.

The ESIA has been accepted by the Eswatini Environmental Authority (EEA), who has issued an environmental compliance certificate and authorisation for the LUSIP II as an entity.

The ESMP (which contain the CMP) deals with impacts predicted to occur from development of the major project components listed under 1.1 above and mitigation measures to be implemented. The predicted impacts are covering the pre-construction/ construction and operational phases of the project.

ENVIRONMENTAL SUPERVISION

The contractor shall hire full-time **Environment Officer and a Health and Safety (SHE) Officer** who shall be responsible for all safety health and environment issues of the project.

The Contractor is expected to cooperate fully with all supervisory staff assigned to the contract site, in particular:

- The Engineer who retains full authority for all site activities;
- The Environmental Monitoring Officer (EMO) who reports directly to the Engineer and through him to the EWADE Project Manager.
- The Environmental Health Officer who reports to the Engineer through him to the EWADE Project Manager.

ENVIRONMENTAL MANAGEMENT OF CONSTRUCTION

An environmental performance objective is associated with each construction activity. This is the target for each activity and forms the baseline against which compliance and progress are measured.

The purpose of specifying and complying with environmental objectives during the construction process is to minimise the many and varied types of environmental and social impacts which may occur. Avoidance is far preferable to the less cost-effective options of undertaking remedial actions or controlling or treating deleterious discharges to the environment.

Contractors are expected to utilise best practice methods and management to meet the environmental performance objectives.

The basis for effective mitigation of construction-related environmental impacts is an **Environmental Management Plan (EMP)** for the tendered work. This will form part of the Contractor's proposal and will be subject to review during tender evaluation. A detailed management plan must also be submitted to the Engineer for approval prior to Contractor site mobilisation (Section 2.1).

The Contractor is expected to be familiar with the relevant clauses and conditions of all environmental and other legislation which may relate to construction site activities and which may impose limitations on actions and procedures. Annex 1 lists the most important current Eswatini Acts and Regulations which deal with environmental items.

COMMUNITY LIAISON

Contractors are required to maintain a high level of communication and cooperation with local communities in order that communities may derive as much benefit as possible from the construction activities and provide the Contractor with local services.

APPROVALS

The Contractor will be required to make submissions for approvals required from the Engineer for activities indicated in Section 2 in good time to allow for any necessary investigations and consultations.

The Contractor should note that certain construction activities require the prior approval of the Board of EWADE and/or of Government of Eswatini Ministries and Departments. In particular, the locations and designs of all borrow pits and spoil dumps must be submitted (through the Engineer) for approval from the Eswatini Environment Authority (EEA) at least three (3) months prior to development.

MONITORING AND AUDITING

Frequent and regular environmental monitoring is an integral component of sound construction site environmental management. Periodic environmental audits of construction sites are a legal requirement. The Contractor is required to provide full cooperation to environmental monitors and environmental auditors during inspections and audits.

During site mobilisation and prior to construction commencement the Contractor will be expected to assist the EMO in preparing a detailed construction monitoring plan which, amongst other things, will:

Identify all construction activities, outline the stages of activity and proposed schedule for each, and assign a monitoring frequency to each;

Be of a standard format which will allow for recording of the environmental status of each activity, any problems or issued occurring, and the status of remedial actions;

The contractor’s environment officer and health and safety officer shall provide an environment, health and safety report at all contract meetings.

Be the basis for reporting by the EMO to the Engineer and EWADE on a weekly or monthly basis (depending on the items under review), with copies provided to the Contractor.

- The specifications in Part 2 require the Contractor to take prompt and appropriate remedial action for all problems reported by the EMO and environmental auditors.

NON-COMPLIANCE

In the event of significant environmental management non-compliance, as so deemed by the Engineer, the Contractor will be ordered to halt work until the specific conditions have been met or the contravening conditions removed. The costs of the work stoppage will be borne by the Contractor.

In cases where the Contractor does not rectify the situation to the approval of the Engineer, the latter is empowered to take steps to remedy the situation and to recover the costs of so doing from the Contractor.

Failure to show adequate consideration for the environmental aspects of the Contract will be deemed sufficient cause for the Contractor's representative and/or any other Contractor's employee to be removed from the site in terms of the Conditions of Contract.

Any dispute arising from application of the environmental requirements will be resolved by the Engineer, whose decision will be final.

PART 2 ENVIRONMENTAL MANAGEMENT SPECIFICATIONS FOR CONSTRUCTION

ENVIRONMENTAL PLANNING

Before any construction work commences, the Contractor shall draw up an Environmental Management Plan (EMP) and submit it to the Engineer for approval.

The Contractor shall note the conditions of the EEA authorisation.

The EMP shall identify all construction activities and components which have potential environmental impacts. The EMP shall specify (but not be limited to):

(a) types, locations and scheduling of construction activity;

(b) size and locations of areas to be cleared, including those for spoil dumps, waste dumps and temporary access roads;

(c) scheduling of land and site reclamation work;

(d) types, locations and scheduling of plant to be brought in and installed;

(e) types, locations and scheduling of waste management systems to be deployed;

(f) types, locations and scheduling of sanitation systems to be deployed;

(g) numbers and types of personnel to be deployed on and off site, and

(h) proposed labour management practices, including housing, transportation and safety care.

The EMP shall indicate the environmental risks of each construction activity and indicate contingency actions to be taken in the event of a risk event occurring.

The EMP shall indicate the activities and steps proposed by the Contractor to meet the environmental specifications outlined in this document.

NATURAL ENVIRONMENT

Vegetation

- The Contractor's personnel shall not inflict any damage through cutting, burning or defacing to vegetation which is not required to be cleared for construction purposes.
- The Contractor shall not introduce any alien vegetation in the form of seed or plants to the site for beautification of office or housing areas or for any other purposes. The use of indigenous trees and shrubs for such purposes is encouraged.

- Wood retrieved from clearing operations may be used for cooking and heating purposes on construction sites, consistent with fire control requirements (Section 2.19).
- The clearing of sight lines outside of the road reserve shall be done by hand and kept to a minimum necessary to obtain readings. Trees and other natural features may not be defaced, painted or otherwise damaged.

Fish and Wildlife Disturbance

- There shall be no hunting, shooting, snaring, harassment, nest-raiding or egg-collecting of any wild animal or bird by construction personnel.
- The Contractor shall ensure that no construction personnel enter areas designated as sensitive for any purpose without prior approval from the Engineer.
- Construction personnel shall not be permitted to fish in rivers and streams traversing or adjoining the project development area.

SITE DEVELOPMENT AND OCCUPATION

Site Access

- All areas of construction activity shall be fenced by the Contractor prior to construction, unless authorisation to the contrary is given by the Engineer. Fencing shall be done at individual areas of construction and around the full perimeter of the site.
- Construction activity shall take place only in areas which are deemed to be safe. All sites that are identified by the Engineer as being unsafe shall be indicated as such with warning signs in all relevant languages.
- Livestock shall not be permitted access to construction sites.

Site Clearing

- The size of areas subjected to land clearance shall be kept to a minimum.
- Areas selected for clearing shall avoid wherever possible locations of agriculturally productive soils, highly erodible soils, steep slopes which are prone to water and wind erosion, important habitats for fauna and flora, forested areas, and locations close to homesteads or settlements which are not going to be resettled.
- The Contractor shall advise the Community Liaison Officer of construction site locations in good time so that local communities can collect wood and plant materials prior to site construction activities.
- Initial felling of all trees with basal stem diameters of 10 cm and more shall be done manually so that local communities can retrieve the wood.
- Cleared vegetation debris which has not been utilised or collected by local communities shall be collected and disposed of as backfill in excavations. It shall not be burned on site.
- No clearing of vegetation shall be done other than in areas that have been delineated for construction.

- No vegetation shall be cut or collected off construction sites for burning or for any other purpose without the prior permission of the Engineer.
- All vegetation not required to be removed shall be protected against damage.

Haul Roads

- The Contractor shall include in the EMP and submit for the approval of the Engineer full details of any haul roads proposed for construction. Sections of any existing or abandoned roads shall be considered for upgrading and rehabilitation before new construction is proposed.
- All vehicle traffic shall be confined to well-defined haul roads.
- Haul roads shall wherever practical not be routed across sloping terrain.
- Road cut slopes shall be designed and constructed to minimise the angle of incline.
- Where practical, road cut surfaces shall be roughened and seeded to increase infiltration of rainfall and decrease the velocity of water across the slope during rainfall events. Section 2.17 provides specifications for seeding of exposed surfaces.
- The Contractor shall ensure that safe crossing points for pedestrians within the construction site are well-marked.

Boreholes

- The siting of boreholes to be drilled on site shall be approved in advance by the Engineer as well as by the Department of Water Resources.
- Wherever possible, boreholes shall be located close to existing or proposed settlements.

BORROW PITS AND QUARRIES

Approvals for borrow pits shall be sought from the Eswatini Environment Authority and shall not be used prior to obtaining clearance. The contractor shall allow adequate time to apply for approvals from the authority.

Borrow pit, quarry and other excavations shall be undertaken with rehabilitation in mind and shall be planned to ensure that rehabilitation of disturbed land can be done in a cost-effective way.

Inner slopes of borrow pits shall be graded so as not to exceed 1:3.

Borrow pits and other excavations shall be backfilled to the maximum extent possible with overburden and/or materials obtained from earthworks, clearing and grubbing.

Suspended solids in runoff from the borrow pits and quarries shall be removed by means of settlement ponds before the runoff is discharged to the environment.

Sluicing of rockfill must be monitored and a return water-settling pond constructed downstream of the area to prevent fines entering the watercourses.

All water discharged from the borrow pits and quarries shall comply with national effluent standards (see Annex 2).

Relevant sections in this document on storm water management, erosion control and land reclamation shall be deemed to apply to all borrow pits and quarries.

SPOIL DUMPS

Spoil dumps shall be located at least 10 m away from natural drainage lines. Spoil dumps shall not be placed in natural drainage lines.

Spoil dumps shall be placed wherever practical in topographically sheltered locations to obtain maximum protection from wind exposure.

Spoil dumps shall be placed in areas where there are barriers to flow from the upstream catchment. These barriers could include catch-water drains or fills. Where there are no barriers, bunded canals designed for 1:5-year rainfall events shall be constructed upstream of the spoil dumps. Where the size of spoil dumps and dumps exceeds 500 m^3, bunded canals shall be constructed downstream to capture runoff from 1:5-year rainfall events.

Spoil dumps located on floodplains shall be finished and contoured to minimise loss of material in a flood or rainfall event.

All spoil dumps assessed as being unstable shall be encircled with silt fences or drainage systems that will collect and dispose of contaminated water.

Spoil dumps shall have slopes not greater than 1:2 (vertical to horizontal). Less steep slopes shall be applied in conditions where erosion risks are indicated to be high.

Spoil dumps shall be smoothed and contoured and compacted to prevent ponding.

Topsoil shall be stored separately from under-burden and other materials (see Section 2.17.4).

Any topsoil dump which is to be maintained for longer than 28 days shall be treated with mulch, roughened and seeded with an approved grass mixture (see Section 2.17.7).

Any under-burden spoil dump which is to be maintained for longer than 28 days shall be covered with a layer of topsoil at least 250 mm thick, treated with mulch, roughened and seeded with an approved grass mixture (see Section 2.17.7).

Unstabilised spoil dumps shall be treated appropriately against dust by hand watering or the installation of temporary sprinklers.

STORM- AND WASTEWATER MANAGEMENT

Water Flows across Construction Sites

- This section shall be read together with that dealing with erosion control (Section 2.8).
- Adequate measures shall be put into place to control surface water flows across and around all construction sites.
- The quantity of uncontaminated storm water entering cleared areas shall be minimised by appropriate site design and by installation of control structures and drains which direct such flows away from cleared areas and slopes to stable (vegetated) areas or effective treatment installations.
- Site drainage lines shall be identified, and control measures installed to handle predicted storm water and sediment loads generated in the mini catchment.
- The extent of continuous slopes in zones where flowing water is anticipated shall be minimised by appropriate design and the installation of control structures.
- The velocity of storm water flows and associated scouring across construction sites shall be controlled through the installation of geotextiles, rock- or other structures.
- All drains constructed on site must discharge into natural drainage lines.
- Any natural drainage lines that discharge water on to the top of a slope shall be directed to grassed areas by intercept drains. Perimeter banks or sediment fences shall be constructed at the toe(s) of slope(s) to contain sediment run-off.
- Cross drains shall be put in place for every stream that is traversed by temporary access roads.

Water Removal from Construction Sites

- Water and sediment control measures, including storm water drainage systems, shall be installed before construction commences.
- Dewatering shall be effected wherever practical by pumping water:
  - (a) preferably onto vegetated areas of sufficient width to remove suspended sediments.
  - (b) as a secondary option to sediment control devices; or
  - (c) as a last option into natural waterways.
- All pumping shall be supervised, and all precautions taken to ensure that turbidity of pumped water is minimised. Pumping operations shall be monitored at least once every hour.
- Water pumped into the storm water system or a natural waterway shall be subjected to sediment removal if the turbidity exceeds 30 NTU. Contaminated water removed from construction sites shall not be pumped into the storm water system or natural waterways unless the quality of such water complies with national effluent standards (Annex 2).
- Precautions shall be taken to ensure that vegetated areas receiving pumped water do not become waterlogged and have adequate capacity to effectively remove suspended solids.

Waste Water

- The Contractor shall submit a site design of waste/foul water management systems as part of the environmental management plan for prior approval by the Engineer. The design shall include at least one site designed and certified in accordance with the Eswatini Waste Regulation (2000).
- All water discharged from the works including effluent from sewage treatment, wash water and storm water from workshops and refuelling areas, as well as all runoff from areas with pollution potential shall comply with national effluent standards (see Annex 2).

- Settlement and retaining ponds shall be installed to allow for the removal of oil, sand silt, cement and other suspended solids in discharged wastewater. Where necessary, the water shall be treated prior to release.

Work in Waterways

Where it is not possible to avoid working in a stream the following additional precautions shall be taken:

- The extent of works and the time during which work in a waterway is carried out shall be minimised.
- Works shall be scheduled wherever practical for the driest months of the year and for the lowest flow of the waterway.
- Protocols to minimise downstream damage shall be drawn up and applied.
- Any disturbance to a levee or stream bank shall be repaired as quickly as possible to avoid erosion.
- Turbidity shall be monitored immediately downstream from the areas in which work is occurring. Where continuous monitoring shows degraded water quality, the work procedures must be modified or halted.
- When working in a concrete channel, appropriate machinery must be used to avoid damage to structures.
- If in-stream activities require construction of a stream crossing, it shall be installed during low-water flows wit downstream weirs in place to trap any released sediment.

- The type of access crossing used shall comprise:
  (a) preferably a bridge: this type of crossing must be used for major waterways and for waterways with high flows;
  (b) a culvert as a second option; or
  (c) a ford: this type of crossing may only be used during periods of low flow and shall not be used if construction will continue during wet periods of the year.
- Any crossing required shall be positioned perpendicular to the flow and located at the narrowest part of the stream. Damage to the stream bed and banks shall be avoided. The crossing shall be engineered to be stable under expected vehicle loads. Drainage over the surface of the crossing and access road shall have adequate controls to ensure that sediment run-off to the stream is minimised. Crossings shall be protected against erosion to prevent excessive sedimentation to prevent washout of the crossing;
- If a cofferdam is placed in a stream, minimum downstream flows shall be maintained that will sustain aquatic ecosystems.

Contingency Planning

Contingency plans shall be in place to deal with site flooding, and shall address the following:

- Methods to limit large quantities of storm water entering excavation areas.
- Enhancement of existing measures and installation of additional controls when an intense storm event is forecast.
- Siting of construction facilities.
- Clean-up procedures, including disposal of excess water.
- Flood warning systems.
- Procedures for preventing the loss through flooding of spoil, fuel, chemicals or other materials that could adversely affect the environment.
- Notification of the relevant authorities, including the Engineer, if unplanned incidents occur that could pose a risk to the environment.

SEDIMENT CONTROL

Erosion and sediment control measures, including storm water drainage systems, shall be installed before construction commences.

Installed sediment detention dams, ponds or basins shall have sufficient capacity for sediment-contaminated run-off to enable retention long enough for suspended sediments to settle out.

Installed erosion and sediment run-off control measures shall be appropriate to site conditions to handle a one-in-two-year storm event for temporary structures, and a one-in-fifty-year storm event for permanent structures which provide ongoing sediment control after a site has been rehabilitated.

Sufficient area shall be provided within the confines of the cleared sites to allow for dumping of silt cleared from the settlement ponds. Settlement ponds shall be cleared and maintained as regularly as is necessary to ensure that they can contain at least a 1:5-year storm event.

Silt loads shall be treated as close to their source as possible using effective sediment traps such as geotextile fences and straw bales.

An adequate inspection, maintenance and cleaning program shall be maintained for sediment run-off control structures.

Contingency plans shall be in place for extreme storm events.

EROSION CONTROL

The specifications in this section shall be read and interpreted along with those in Section 2.6 (storm- and wastewater management).

Site activities shall take overall recognition of the importance of measures to avoid and reduce erosion by phasing the work program to minimise land disturbance in the planning and design state, by keeping the areas of land cleared to a minimum, and by ensuring that the period for which areas remain cleared are kept to a minimum.

Energy dissipaters such as gabion mattresses shall be placed at the outlets from diversion canals and silt traps.

Concrete verges shall be developed at the main road crossing points which are developed as part of dam construction activities.

Erosion of footpaths linked to these main road crossings shall be prevented by paving the stretches which are susceptible to erosion. The Engineer shall confirm the extent of paving required.

All cleared areas shall be promptly rehabilitated and in accordance with specific instructions from the Engineer.

FUEL AND CHEMICAL STORAGE

The amounts of fuel and chemicals stored on site shall be minimised.

Storage sites shall be provided with bunds to contain any spilled liquids and materials.

Regular inspections shall be carried out to detect leaks and spillages. All storage facilities shall be maintained as regularly as is necessary to ensure they meet the original specification.

Fuel tanks shall be established on impervious bunded concrete slabs and equipped with a leak proof sump.

Fuel tanks and similar storage facilities with a high pollution potential shall be bunded to 110% of their storage capacity.

Dedicated buildings and/or containment areas shall be established to contain or store hazardous substances. These facilities shall be located in excess of 30 m from any watercourse or drainage line.

Contingency plans shall be put in place for dealing with emergency spills and hazard events.

All spillages shall be cleaned up by the Contractor immediately after they take place. Steps shall be taken to prevent a recurrence of a spillage.

Areas which have been contaminated by minor or accidental spillages shall be excavated and the contaminated material moved to a waste site designed and certified in accordance with the Eswatini Waste Regulation (2000). The costs involved for the excavation of contaminated areas, the replacement with clean and uncontaminated soil, as well as the disposal of the contaminated soil, shall be borne by the Contractor.

REFUSE AND WASTE DISPOSAL

The Contractor shall submit a site design of waste management systems as part of the environmental management plan for prior approval by the Engineer. The design shall include at least one waste site designed and certified in accordance with the Eswatini Waste Regulation (2000).

Waste management on site shall be carried out by applying, in order of preference, waste avoidance, reuse, recycling and disposal.

Burning of waste material shall not be permitted except under special circumstances and with prior approval of the Engineer.

The following materials may not be spilled or disposed of on site or within the region:

(a) oil, whether used or unused;

(b) batteries;
(c) bulk bituminous products; and/or
(d) other materials identified for removal by the Engineer.

Such materials shall be removed from site to the original suppliers. The arrangement with suppliers to accept these materials shall be part of the tender.

The Contractor shall provide and maintain adequate facilities for litter collection (e.g. bins) at strategic locations around office, garage, parking, housing facilities and locations where food is consumed.
Litter collection at all construction sites shall be undertaken at least once per working day. Work teams shall be supplied with refuse bags which can be disposed of daily in skips at centralised locations.
A high quality of housekeeping shall be maintained on all construction sites to ensure that materials are not left where they can be washed or blown away to become litter.
The contractor's staff shall be made fully aware of the need to avoid littering.

SANITATION

Suitable toilets shall be provided for the staff at all points at which workmen are carrying out duties under the contract.
The Contractor shall monitor that toilet facilities are used by personnel and that use of non-designated areas is actively discouraged.
Latrines and ablution facilities shall not be situated within 150 m of any borehole, well or river.
The Contractor shall ensure that sewerage is removed and disposed of in an adequate and approved septic tank and soakaway system.
The Factories, Machinery and Construction Works Regulation (1974) of The Factories, Machinery and Construction Works Act, 1972 (No 17 of 1972), and any amendment thereof shall apply in terms of sanitary accommodation.
The Building Operations Regulation, 1969 of The Building Act, 1968 (No 34 of 1968) and any amendment thereof shall also apply in terms of latrine and chemical closet requirements.
The Public Health Act, 1969 shall apply in terms of public nuisances and provision for sanitation

AIR QUALITY

The Contractor shall ensure that all vehicles and machinery are fitted with appropriate emission control equipment, are maintained frequently and serviced to the manufacturer's specifications.
Smoke emitted from internal combustion engines running on site shall not be visible for more than ten seconds.
Burning of materials including wood, grass and refuse which emit visible smoke shall not be permitted on construction sites.

DUST CONTROL

A dust prevention strategy shall be included in the environmental management plan.
Dust dispersion from construction activities, unsurfaced roads, spoil dumps and other construction locations shall be limited and suppressed to the maximum extent practical.
Spoil dumps shall be positioned such that they are not vulnerable to wind erosion.
Smooth exposed surfaces which generate dust shall be deep ripped and left rough and cloddy to reduce the wind velocity at the soil surface.
Wind fences shall be deployed at problematic dust-generating sites if this is appropriate for the site.

Spoil and other dust-generating dumps which are left unused for 28 days or longer shall be sprayed with water or chemically inert stabilisers to control dust and treated with mulch and seeded as per Section 2.17. Untarred roads shall be sprayed with water from a water cart to limit dust generation by construction vehicles. Where spraying of water on roads is not adequate for dust control, environmentally benign binding agents shall be used to limit dust generation by construction vehicles.
An appropriate freeboard shall be maintained in trucks hauling dirt, sand, soil and other loose material when leaving the road reserve.

PLANT REPAIR, MAINTENANCE AND CLEANING
Any vehicle maintenance and repairs shall not be undertaken within a 30-m radius of any water courses and drainage lines. Any facilities susceptible to oil, petrol and diesel spillage shall be located a minimum of 30 m and preferably 50 m from all water course.
Repair yards, batching plants and stationary machines shall be provided with sumps, and spilled fluids and runoff shall be kept in a conservancy tank until removed from the site in terms of the Eswatini Waste Regulation (2000).
Adequate collection facilities such as diversion mounds, ditches, drains, oil separation sumps and sedimentation ponds shall be constructed at each location with a pollution potential.
All repair work away from bunded areas shall make use of drip trays.
Regular inspections shall be carried out to detect leaks and spillages. These facilities shall be maintained as regularly as is necessary to ensure they meet the original specification.
All construction plant required for use on the works shall be thoroughly cleaned before dispatch to the site and shall be cleaned before removal from the site. Washing of incoming or outgoing plant at or near rivers and local streams will not be permitted.

NOISE AND BLASTING
Blasting

- The Contractor shall obtain the required blasting permit(s) from the Inspector of Explosives and shall always comply with specified conditions.
- The Contractor shall prepare and submit to the Engineer for prior approval a map and description of blast hazard areas.
- The Contractor shall prepare and submit to the Engineer a monthly schedule of proposed blasting operations which set out locations, dates, times, charge size, frequency and sequencing of blasting.
- Twenty-one (21) days in advance of blasting operations, people living or working in or near the blast-hazard zone shall be notified of the intention to blast and shall be advised on the location, date and times of the blasts, and given a description of the sounds of the warning sirens.
- Blasting within 500 m of any dwelling or building shall be restricted to between 06:00 and 18:00 daily except for Sundays when no blasting shall be permitted. If blasting is required after 18:00, it shall specifically be authorised by the Engineer.
- Personnel must be cleared in good time from an area within a 500-m radius of a proposed blasting location prior to any blasting operations. One hour before blasting, a distinctive siren shall be sounded. Five minutes before blasting, as second distinctive siren (different from the first) shall be sounded.
- The Contractor shall assess whether construction-generated noise is disturbing to schools and clinics within 2 km of the construction sites and shall take steps to reduce or otherwise minimise such disturbance.

- In the event of any reported blasting damage to non-construction structures or facilities, the Contractor shall compile a written report supported by a photographic record and submit same to the Engineer within 24 hours. All blasting operations shall be immediately suspended until resumption is authorised by the Engineer.
- All damage to non-construction structures or facilities shall be repaired as quickly as possible at the Contractor's expense in accordance with written authorisation provided by the Engineer and following agreement by the owner(s) to receive repairs.

NOISE

- Construction-site generated noise shall not be above background levels inside any homestead adjacent to the construction areas between 10 pm and 7 am.
- The Community Committee shall be advised in advance when unavoidable out-of-hours work will occur.
- Appropriate and effective mufflers will be fitted to earth-moving and other vehicles on the site.
- Noise from vehicles and on-site powered machinery and equipment shall not exceed the manufacturer's specifications, based on the installation of silencers.
- Depending on the location of the facility, suitable noise suppression or abatement measures may be required, such as the provision of earthen embankments or other noise screens.
- Silencers on construction equipment shall be maintained to ensure no deterioration in noise-dampening capacity.
- The Contractor shall respond timeously in the event of any complaints by residents or others about disturbing noise. The noise source shall be identified and appropriate noise mitigatory measures instituted in consultation with the affected party(ies).

CULTURAL RESOURCES

Graves

Identification and removal of all graves within the construction site(s) will be undertaken under the resettlement programme and the employer notified as soon as identified. There is a slight possibility that unmarked graves may be encountered during construction excavations and other site activities. In such an event, the Contractor shall immediately halt the disturbance and inform the Engineer, who shall take the necessary steps to contact the Community Committee and effect the necessary removal of the graves from the construction area.

Artefacts

There is a slight possibility that historic artefacts (e.g. iron implements, pottery shards) may be unearthed by construction excavations and other site activities. In such an event, the Contractor shall immediately halt the disturbance and inform the Engineer, who shall take the necessary steps to contact archaeologists and cultural historians and effect the necessary collection of the material from the construction area.

LAND RECLAMATION

Disturbed areas shall be rehabilitated through landscaping, topsoil replacement and the establishment of vegetation.

Wherever possible, rehabilitation shall take place during the construction phase as soon as the disturbing force is removed from the area to be rehabilitated.

All construction activities, specifically borrow-pit development and additional shall be undertaken with rehabilitation in mind and shall be planned to ensure that rehabilitation of disturbed land can be done in a cost-effective way.

Timing and Scheduling of Reclamation

- Where the re-vegetation of disturbed areas is delayed by construction or growing season constraints, appropriate intermediate measures shall be taken to control erosion, including the use of energy dissipaters, the use of berms and storm-water-diversion canals, and the application of straw mulches or soil binders to exposed soils.
- Vegetation establishment in disturbed shall be undertaken as early as possible, with growing season and water availability being the primary time constraints.
- Re-vegetation and mulching shall be carried out progressively as each section of works is completed; the interval between clearing and re-vegetation shall be kept to a minimum.
- If more than one contractor is working on a site, the work schedules shall be coordinated so that there are no delays in construction activities resulting in disturbed land remaining unstabilised.
- Construction activities shall be programmed so that the areas of exposed soil are minimised during times of the year when the potential for erosion is high (e.g. summer).
- Sites shall be stabilised, and erosion controls installed so that they remain effective during any pause in construction, especially during the wetter months.
- Any cultivated and/or grazing land disturbed including areas impacted by borrow pits and spoil dumps, shall be rehabilitated as soon as the disturbing force is removed, within the constraints of the growing seasons.

Landscaping

- Landscaping shall be undertaken to restore the natural topography of the areas that have been disturbed or else to reduce slopes to stable gradients (no more than 1:3 and preferably flatter).
- Spoil from construction shall be used for landscaping purposes where possible. Additional material which may be required for landscaping shall be sourced with the Engineer's approval.
- Borrow pits and other excavations shall be backfilled with overburden and/or materials obtained from clearing and grubbing.
- All slopes which do not form part of an engineering structure shall be graded so that no slope exceeds a maximum gradient of 1:3. Where required by the Engineer, agricultural type drains shall be provided to control erosion.
- Spoil dumps shall be formed in such a manner that the final profile shall appear as a natural extension of the adjacent undisturbed ground profiles.
- Contoured surfaces shall be left rough to facilitate binding with topsoil and vegetation.

Area Preparation

- Manual preparation of the reclamation beds shall be given priority consideration to create employment opportunities for the local communities.
- Mechanical preparation of the seed bed shall not be carried out on slope gradients exceeding 1:4.

Topsoil

- Topsoil[8] shall be sourced from areas which are cleared for construction and spoil dumps, conserved and used judiciously in the rehabilitation of disturbed land. It should be noted that the project area includes 9 299 hectares with soils deeper than 400 mm and 1 295 hectares with sols deeper than 700 mm. The contractor shall preserve all topsoil within the immediate work areas.
- Topsoil shall be stripped, stored and respreads with as little compaction as possible.
- Topsoil stripping shall be scheduled for the dry season.
- Where practical, topsoil spoil dumps shall not exceed 2 m in height to prevent compaction and limit dispersion of dust from the spoil dumps.
- Single handling of topsoil shall be practised where possible.
- Stored topsoil shall be free of deleterious matter such as large roots, stones, refuse, stiff or heavy clay and noxious weeds which would adversely affect its suitability for planting.
- Any topsoil dump which is to be maintained for longer than 28 days shall be treated with mulch, roughened and seeded with an approved grass mixture (see Section 2.17.7).
- Land to which topsoil has been applied shall be vegetated as soon as possible after application.
- Topsoil shall not be required on slopes with gradients steeper than 1:2 as it may be washed away by erosion or caused to slip off by gravity. On slopes with a gradient of 1:2 or less, the layer of topsoil spread over the landscaped surface shall be at least 200 mm. Topsoil shall be spread manually on slopes with a gradient of less than 1:4. Topsoil shall be spread with as little compaction as possible.
- To restore the crop-producing potential of fields, a topsoil layer at least 250 mm in depth shall be spread across the surface. Topsoil used shall be of the same or better quality than that stripped from pre-disturbance arable lands. Care shall be taken to ensure there are no stones or boulders in the topsoil layer that shall be a mechanical limitation to future cultivation.
- To restore the grazing potential of lands, a topsoil layer at least 200 mm in depth shall be spread across the surface during rehabilitation. Topsoil used shall be of the same or better quality than that stripped from pre-disturbance grazing lands.

[8] topsoil is defined as the top layer of soil that can be mechanically removed to a depth of about 100 mm without ripping or blasting.

Manures, Mulches and Anti-Erosion Compounds

- Manure used for land reclamation shall be free from soil, weed seed and other contaminants.
- Mulch used for land reclamation shall be natural, dried fibres of hay, chaff or tall grass clippings of 50 mm and 400 mm in length, with seed heads intact.
- Mulch shall be applied by hand immediately after seeding or mixed with water as part of a hydro seeding mix.
- Where anti-erosion compounds are used, they shall be applied simultaneously with hydro seeding, at the rate specified by the manufacturer.

Fertilizers, Herbicides and Pesticides

- Samples of different types of topsoil shall be tested to determine the quantity and type of fertiliser required for vigorous grass growth.
- The type of fertiliser to be used shall be one or more of the following[9]
  a) agricultural lime (1 tonne/ha)
  b) super phosphate (250 kg/ha)
  c) limestone ammonium-nitrate (250 kg/ha)
  d) 2:3:2 (22) (250 kg/ha)
  e) monophosphate (250 kg/ha)
  f) 3:2:1 (22) (250 kg/ha)
  g) 3:2:1 (25) (250 kg/ha)
  h) 2:3:4 (30) (250 kg/ha).
- The spread of invader and alien species on disturbed land shall be controlled without the use of herbicides (unless otherwise instructed by the Engineer) until the vegetation cover can provide sufficient natural weed control.
- The Contractor shall not make use of any pesticide or insecticide unless so specified by the Engineer.

[9] application rates indicated here are estimates and actual application rates shall be determined from site specific soil sampling.

Vegetation Establishment

- Runners of *Cynodon dactylon* (star or couch grass) shall be used for reclamation in grassland areas (areas which have not been disturbed by cultivation).
- Seed mixes shall contain a rapidly germinating annual commercial species[10] which can act as a "nurse crop" to stabilise the soil rapidly and then die out, allowing for colonisation by indigenous species.
- Seed mixes shall contain perennial commercial species with a high viability. These species shall not be invasive. The following species are recommended:
  a) Cynodon dactylon (10 kg/ha)
  b) Chloris gayana (10 kg/ha)
  c) Digitaria eriantha (6 kg/ha)
  d) Eragrostis curvula (2 kg/ha)
  e) Dactylis glomerata (4 kg/ha)
  f) Paspalum notatum (8 kg/ha).

Method of Planting

- Manual Option (Grass Runners) on Gradients less than 1:3
  (a) Runners of a grass with a stoloniferous and rhizomatous growth form[11] shall be hand planted into drills on the slopes to facilitate rapid stabilisation.
  (b) The plants must be well watered 24 hours before removal from the supply site and must be planted within 8 hours of removal.
  (c) A topsoil layer of at least 250 mm shall be provided prior to planting.
  (d) Areas where hand sowing of runners shall take place shall be well watered before planting.
  (e) Trenches for the runners shall be cut approximately 80 mm deep along the contour at a spacing of approximately 150 mm. These shall be parallel to the contours of the finished surface.
  (f) The plants shall be placed at 150 mm intervals with roots well covered and leaves exposed.
  (g) A mulch of grass cut from the surrounding vegetation when the grass is in seed shall also be used – the mulch application rate shall be 1,5 tonnes/ha.
  (h) The mulch may need to be secured on slopes with a gradient greater than 1:2, particularly during the rainy season (October to March), with pegged netting (temporary plastic bird netting or permanent biodegradable geonetting).
  (i) Seeds can be added to the mulch if deemed necessary.
- Mechanical Option (Hydro seeding) on Gradients less than 1:3
  (a) The grass and fertiliser slurry shall include a mulch of grass cut from the surrounding areas when the grass is in seed. The mulch application rate shall be 1,5 tonnes/ha.
  (b) An adhesive shall be included in the mixture to prevent the seed and fertiliser from blowing, washing or slipping.
  (c) Only good-quality fresh seed shall be used.
- Manual Option (Hand Sowing) on Gradients more than 1:3

[10] *Eragrostis teff* (teff) applied at a rate of 1,0 kg/ha is preferred for this purpose.
[11] *Cynodon dactylon* (star- or couch grass) is preferred for this purpose.

(a) Trenches for the seeds shall be cut approximately 80 mm deep along the contour at a spacing of approximately 150 mm.
(b) Seeds and fertiliser shall be broadcast into the trenches by hand and soil shall be gently compacted using a garden rake or similar implement.
(c) A mulch of grass cut from the surrounding vegetation when the grass is in seed shall also be used – the mulch application rate shall be 1,5 tonnes/ha.
(d) Only good-quality fresh seed shall be used.

- Mechanical Option on Gradients more than 1:3

(a) Fertiliser shall be spread over the surface and ploughed or disked into the soil.
(b) The surfaces shall be harrowed until a fine seed bed has been prepared.
(c) Seed shall be broadcast mechanically and then rolled with an agricultural roller.
(d) A mulch of grass cut from the surrounding vegetation when the grass is in seed shall also be used – the mulch application rate shall be 1,5 tonnes/ha.
(e) Only good-quality fresh seed shall be used.

- Irrigation

(a) Micro spray irrigation shall be used, and the irrigation system supplied from a water cart.
(b) Planted areas shall be irrigated daily until firm establishment of the seedlings and/or runners.
(c) Following successful vegetation establishment, planted areas shall be irrigated on a weekly basis until vegetation cover effective in resisting erosion has been established.
(d) Irrigation of established vegetation shall be applied if rainfall is inadequate to maintain growth and/or if vegetation dieback occurs.

- Maintenance

(a) Monitoring of plant growth shall be conducted on a weekly basis during initial phases and monthly when plants have become firmly established.
(b) Vegetation will be replanted in areas where vegetation cover has decreased due to dieback or has failed otherwise to successfully establish.
(c) Noxious weeds, invasive and alien species shall be controlled by pulling, cutting or any other means approved by the Engineer. The use of herbicides shall not be allowed unless specified by the Engineer. Bare patches shall be replanted.
(d) Acceptable cover shall be construed as not less than 75% of the area being covered in the case of hydro seeding and sowing and 50% in the case of hand planted runners. There shall be no bare patches greater than 750 mm in diameter.

Follow-up

- For one full growing season after the vegetation has been planted on the disturbed land, access to rehabilitated areas, especially by livestock, shall be prevented by means of fencing.
- Rehabilitated areas shall be monitored and maintained until a self-sustaining plant community that protects soil against erosion has been established.
- It shall be the Contractor's responsibility to eradicate all invasive and alien plant species introduces to the cultivated land in the topsoil within the first year following site reclamation.

Other

- The Contractor shall be responsible for the repair of erosion or drift sands caused by his activities.
- Temporarily disturbed land shall be rehabilitated to its pre-disturbance potential.

PUBLIC HEALTH ISSUES

In the event of an outbreak of illness of a contagious or epidemic disease amongst construction personnel, the Contractor shall comply with and carry out such regulation, orders and requirements as may be made by the Government of Eswatini, or the local medical or sanitation authorities for the purposes of dealing with and overcoming the same.

FIRE CONTROL

All construction personnel shall receive training on fire hazards and techniques to extinguish any fire that may be initiated on the site.

The equipment required to extinguish any fires that may be initiated by construction activities must be installed on the site.

Flammable materials shall be stored under conditions that must limit the potential for ignition and the spread of fires.

Staff shall not be permitted to light fires on the site or on surrounding land, in areas other than those designated as safe by the Engineer.

There shall be a 5-m firebreak around the construction site. This area shall be kept clear of vegetation and refuse for the duration of the contract.

The Factories, Machinery and Construction Works Regulation, 1974 of the Factories, Machinery and Construction Works Act, 1972 (No 17 of 1972) and any amendment thereof shall apply in terms of general safety and fire precautions.

EMPLOYMENT

Local Preference

- The Contractor shall give employment preference to residents of the Project Area in accordance with approved agreements and procedures adopted by the Community Committee and shall use the database provided by the Committee as a basis for identifying potential job candidates (see hiring protocol in Annex 5).
- The Contractor's core of employees shall comprise no more than 15% of the staff employed on the job during normal production periods. Where skilled workmen, artisans and operators are not available locally, they shall be employed from non-local sources.
- The Contractor shall make available to the Community Committee specific and relevant information on the available employment; this shall include number of type of jobs, skill requirements for the jobs, duration of the jobs, remuneration scales, hours of work, conditions of work, procedures for the application of jobs, procedures for selecting job applicants, and training and certification available on the job.
- The Contractor shall consider personnel from the applicants put forward by the Community Committee and shall consider aptitude, health, previous training and expertise. The Contractor shall as far as possible ensure that the distribution of hired personnel is proportional to the numbers of local applicants from the respective chiefdoms. Shall it not be possible to ensure equal distribution at one selection; the Contractor shall endeavour to correct for the difference at the next selection.
- No casual job seekers outside the construction site shall be selected, unless they are selected by means of the correct process.
- The Contractor shall maintain and submit records of all hiring, including dates of hiring and work commencement, the names and details of the applicants hired, and the chiefdom origins of the hired.
- The Contractor shall maintain written records of all discussions with the Community Committee and its sub-committees.

Training

- The Contractor shall set up a system of certification and/or accreditation related to training, to ensure all the workers have proof of work performed for future job application.

- The Contractor shall be responsible for the training and supervision of inexperienced workers in accordance with Legal Notice No 67 of 1974 of The Factories, Machinery and Construction Works Act, 1972.

Employment Conditions

- The Contractor is required to adhere to the wage rates and conditions set out in the Eswatini Regulation of Wages (Building and Construction Industry) Order 1989 (Legal notice No 79 of 1989) and the Wages Act, 1964 (No 16 of 1964) or a superseding legal notice, or the Contractor shall negotiate wage rates, hours of work and conditions with the Commissioner of Labour.
- The Contractor shall maintain records of time worked, wages paid and training to show compliance.
- The Contractor shall clearly display on notice boards (on site) the general rates of wages, work hours and conditions of labour.

PART 3 HEALTH AND SAFETY SPECIFICATIONS FOR CONSTRUCTION

RISK ASSESSMENT

The Contractor shall formally appoint a competent person (in writing) to perform a thorough Risk Assessment of all construction activities before the commencement of any construction work. This risk assessment shall form part of the Health and Safety Plan to be submitted, implemented and maintained by the contractor. The basis for effective mitigation of construction-related health and safety impacts is **Health and Safety Plan (HSP)** for the tendered work. This will form part of the Contractor's proposal and will be subject to review during tender evaluation. A detailed HSP must also be submitted to the Engineer for approval prior to Contractor site mobilization.

The Risk Assessment shall include at least the following: -

- The identification of the risks and hazards to which persons may be exposed to;
- The analysis and evaluation of the identified risks and hazards;
- A documented plan of safe work procedures to mitigate, reduce or control the risks and hazards that have been identified;
- A monitoring plan; and
- A review plan, for post implementation assessment.

Based on the Risk Assessment, the Contractor must develop a set of site-specific Health and Safety rules that will be applied to regulate Health and Safety aspects of the construction activities. The Risk Assessment, together with the site-specific Health and Safety Rules shall be submitted to the Engineer for approval before site mobilization commences.

Review of Risk Assessments

The contractor is to review the Hazard Identification, Risk Assessments and Safe Work Procedures at each Production Planning and Progress Report meeting as the Contract works develop and progress and each time changes are made to the designs, plans and construction methods and processes (monthly). In the event of any change in working circumstances, the Hazard Identification, Risk Assessments and Safe Work Procedures are to be reviewed and updated.

The contractor shall provide the Employer and the Engineer, and all concerned parties with copies of any changes, alterations or amendments brought about by the above.

LEGAL REQUIREMENTS

All contractors entering into Contract with EWADE shall as a minimum comply with the following: -

- Occupational Health and Safety Act and Regulations (Act 9 of 2001);
- The Employer and the Engineer shall access and verify the competency of Contractors/persons allowed (authorised) to enter the Contract work area by studying the required Portfolio of Evidence;
- The portfolio of evidence submitted with the tender shall include: -
    - Qualifications and relevant experience of the responsible person;

- Last 5 similar projects;
- Valid First Aid certificate;
- Valid Responsible Person Certificate;
- Valid certificate of training for confined space entry;
- Valid certificate of training for firefighting.

STRUCTURE AND RESPONSIBILITIES

Overall Supervision and Responsibility for Health and Safety

The Employer and the Engineer shall ensure that the Contractor implements and maintains the agreed and approved Health and Safety Plan.

Further (Specific) Supervision Responsibilities for Health and Safety

The Contractor shall appoint designated competent employees and/or other competent persons as per requirement. The appointments shall be in writing and the responsibilities clearly stated together with the period for which the appointment is made.

Designation of Occupational Health and Safety Representatives

The Contractor shall ensure Health and Safety representatives are appointed for every workplace where employees are exposed to risks.

Occupational Health and Safety Representatives shall be designated in writing and the designation must include the area of responsibility of the person and term of the designation.

The Contractor shall ensure that the designated OH&S Representatives conduct an inspection of their respective areas of responsibility using a checklist and report thereon on a daily basis.

Monitoring, Reporting and Review of Health and Safety Performance

The Contractor shall report all incidents to the Engineer and the Employer.

The Contracts Manager/ SHEQ officer shall submit reports regarding all incidents to the Employer on a regular basis.

TRAINING, AWARENESS AND COMPETENCE

General Induction Training

All persons attending site are to attend a general site induction session presented by the Contractor.

All persons on the site shall be in possession of documentation/proof that they have undergone general induction training.

The Contractor shall develop project specific induction training based on the Risk Assessments for the Contract work and train all employees and visitors as appropriate.

Other Training

All operators, drivers and users of construction vehicles, mobile plant and other equipment shall be in possession of relevant documentation proving that they have recently undergone training to operate said vehicles, plant and equipment and are competent in the use of the said vehicles, plant and equipment.

Awareness & Promotion

The Contractor shall put in place a strategy to promote sound health and safety awareness and culture. The following are some of the strategies that shall be put in place: -

- Toolbox Talks;
- Posters;
- Competitions;
- Safety Videos; etc.

Competence

The Contractor shall ensure that all appointed staff are competent and that all training required to do the work safely and with minimized risk to health, has been completed before work commences.

The Contractor shall ensure that follow-up and refresher training is conducted as the Contract work progresses and the work situations change.

Records of all training shall be kept on the Health and Safety file for auditing purposes.

MONITORING, REPORTING AND CORRECTIVE ACTION

Bi-weekly Audits by Employer

The Employer, through its Environmental Health Officer, will conduct Audits to comply with relevant legislation to ensure that the Contractor has implemented and is maintaining the agreed and approved Health and Safety Plan.

The Contractor shall conduct his own internal audits on a regular basis to verify compliance with his own Health and Safety Plan.

The Contractor's Occupational Health and Safety Officers shall conduct inspections of their areas of responsibility and report thereon to their supervisor.

All the outcomes of the above-mentioned inspections shall be in writing, reviewed, endorsed and placed in the official Health and Safety File.

INCIDENT REPORTING AND INVESTIGATION

Reporting of Accidents and Incidents

The Contractor shall report all incidents where: -

- A major incident or accident has occurred;
- The health or safety of any person has been endangered;
- Whenever a dangerous substance has been spilled;
- Whenever the uncontrolled release of any substance under pressure has taken place;
- Machinery or any part of machinery fractured or failed resulting in flying, falling or uncontrolled moving objects;
- Machinery ran out of control.

All such reports shall be made in writing to the Engineer and the Employer's Environmental Health Officer within two days of the incident having taken place.

The Contractor Shall provide The Employer with copies of all internal and external accident/incident investigations.

Accident and Incident Investigation

The Contractor shall be responsible for the investigation of all accidents/incidents where employees and non-employees were injured to the extent that he/she/they had to be referred for medical treatment doctor, hospital or clinic and the results of the investigation shall be entered into the Accident/Incident Register.

The Contractor shall be responsible for the investigation of all minor, non-injury incidents and near misses e.g. oil spillages.

The Employer reserves the right carry out its own internal investigation into an incident or call for an independent external investigation.

OPERATIONAL CONTROL

Emergency Preparedness, Contingency Planning and Response

The Contractor shall appoint a competent person to act as Emergency Coordinator.

The Contractor shall conduct an emergency identification exercise and establish what emergencies could possibly develop on site.

The Contractor shall develop detailed contingency plans and emergency procedures for such emergencies.

First Aid

The Contractor shall provide appropriate First Aid equipment and shall have qualified First Aiders on site, as required by the Occupational Health & Safety Act.

Security

The Contractor shall develop, implement and maintain Security and Site Access Control Rules and procedures throughout the construction period.

Access control shall include the rule that non-employees will not be allowed on site unaccompanied.

Construction Vehicles and Mobile Plant (CV&MP)

All construction vehicles and mobile plant shall be inspected by the Contractor prior to being allowed onto a project work front.

The suppliers of hired vehicles, plant and equipment shall be required to comply with this specification as well as the Occupational Health and Safety Act and Regulations.

Good Housekeeping

The Contractor shall ensure that good housekeeping practices are implemented so that: -

- Every workplace is kept clean, orderly and free of tools and materials that are not required for the work being done;
- Materials and equipment are properly secured and stored;
- All scrap, waste and debris are removed from site regularly and disposed of in a safe and responsible manner.
- Construction sites are fenced off to prevent unauthorized entry by persons and/ or animals.

Eating, Changing and Toilet Facilities

The Contractor shall provide adequate eating and ablution facilities for its employees: -

- Eating facilities shall be provided in a location that is adequately sheltered from natural elements;
- Adequate changing, and toilet facilities shall be provided for both sexes at all work fronts;
- At least 1 No. shower per 15 workers and 1 No. toilet per 30 workers shall be provided.
- Chemical toilets shall be put in place at all work fronts.

Personal & Other Protective Equipment (PPE)

The Contractor shall identify all workplace hazards and shall endeavor to eliminate them wherever possible.

Where this is not possible, suitable steps shall be to protect workers from these hazards.

The Contractor shall inform all employees of the health and safety hazards they are likely to encounter in their workplace and shall issue them with suitable personal protective equipment (PPE) to protect them from these hazards.

The Contractor shall maintain the equipment and replace is if it no longer serves its protective purpose.

The Contractor shall instruct and train all employees in the use of their PPE. The Contractor's Employees do not have the right to refuse to use/wear safety equipment.

Public Health & Safety

The Contractor is responsible for ensuring that all non-employees affected by the construction work, such as, visitors, the benefitting and surrounding community and passersby, are made aware of dangers likely to arise from the construction work, as well as the precautionary measures to be observed to avoid or minimize these dangers.

Appropriate signage shall be posted to this effect across the site and all employees on site shall be instructed to ensure that non-employees are protected at all times.

All authorized non-employees entering the site must receive induction into the hazards and risks and the control measures.

All non-authorised persons shall be immediately directed off the site.

ANNEXURES

Annex 1. List of Eswatini environmental and related legislation with clauses and conditions applicable to construction sites and activities

1. The Water Act, 2003 (Act No 5 of 2003)
2. The Environment Management Act, 2002
3. The Flora Protection Act, 2000
4. The Environmental Audit, Assessment and Review Regulations, 2000
5. The Waste Regulations, 2000
6. The Water Pollution Control Regulations, 1999 (draft)
7. The Air Pollution Control Regulations, 1999 (draft)
8. Eswatini Environment Authority Act, 1992
9. The Human Settlements Authority Act, 1988 as amended in 1992 (Act No 13 of 1992)
10. The Game Act (Amended), 1991
11. The Protection of Fresh Water Fish Act, 1938
12. The Wild Birds Protection Act, 1914
13. The Natural Resources Act, 1951 (No 71 of 1951)
14. The Draft Eswatini Public Health Bill, 1999

Annex 2. Eswatini effluent standards (from Schedule Two of Regulations 2 and 4 of the Water Pollution Control Regulations 1999).

Parameter/Substance	*Units of Measurement*	*Limit*
Colour	mg/l Pt Scale	20 maximum
Odour/Taste		not detectable after being diluted 3-fold
pH	pH units	minimum of 5.5 and a maximum of 9.5
Conductivity	ms/m	20 maximum
Dissolved oxygen	% saturation	minimum of 75
Temperature	degrees C	maximum of 35
Chemical oxygen demand	mgO2/l	75 maximum
Biological oxygen demand	mgO2/l	10 maximum
Total dissolved solids	mg/l	maximum of 500 above intake water
Suspended solids	mg/l	25 maximum
Sodium content	mg/l	maximum of 50 above intake water
Soap, oil or grease	mg/l	100 maximum
Residual chlorine	mg/l	0.1 maximum
Free and saline ammonia	mg/l	10.0 maximum
Arsenic	mg/l	0.5 maximum
Boron	mg/l	1.0 maximum
Total chromium	mg/l	0.5 maximum
Copper	mg/l	1.0 maximum
Phenolic compounds (as phenol)	mg/l	0.1 maximum
Phosphates	mg/l	2.0 maximum
Lead	mg/l	0.1 maximum
Cyanides	mg/l	0.5 maximum
Sulphides	mg/l	1.0 maximum
Fluorides	mg/l	1.0 maximum
Parameter/Substance	*Units of Measurement*	*Limit*
Zinc	mg/l	5.0 maximum
Cadmium	mg/l	0.05 maximum
Mercury	mg/l	0.02 maximum
Total faecal coliforms	per 100 ml	10 maximum

Annex 3. Eswatini water quality standards (from Schedule One of Regulations 2 and 3 of the Water Pollution Control Regulations (1999)

Physic-chemical parameters	***Standard***
Dissolved oxygen	minimum of 4 mg/l (surface water only)
pH	minimum 6.5 and maximum 8.5
EC	1,800 m/cm maximum
Turbidity	5 Nephelometric units maximum
Hardness	1,000 mg/l maximum (as calcium carbonate)
Chemical oxygen demand	10 mg oxygen/l maximum
Biological oxygen demand	5 mg oxygen/l maximum
Anions	
Nitrate	10 mg N/l (as nitrogen) maximum
Nitrite	0.2-3 mg N/l (as nitrogen) maximum
Ammonia	0.6 mg N/l maximum
Fluoride	1.0 mg/l maximum
Cations	
Iron	1 mg/l maximum
Manganese	0.5 mg/l maximum
Mercury	0.001 mg/l maximum
Cadmium	0.003 mg/l maximum
Aluminium	0.2 mg/l maximum
Microbiological Parameters	
Total Coliforms	1 – 10 per 100 ml maximum
Faecal Coliforms	1 – 10 per 100 ml maximum

Annex 4. Eswatini Environmental Authority Authorisation

SWAZILAND ENVIRONMENT AUTHORITY

RHUS Office Park
Along Karl Grant Street
Mbabane

P.O.Box 2602
Mbabane, Swaziland
Tel: 2404 6960; 2404 7893 Fax: 2404 1719
Email: <ceosec@sea.org.sz>
<Reception@sea.org.sz>

SWADE
23 FEB 2015
RECEIVED

16th February 2015

Our Ref: SEA/PRJ/5.04

The Acting Chief Executive Officer
Swaziland Water and Agricultural Development (SWADE)
P. O. Box 5836
Mbabane

LUSIPII PROJECT MANAGER
For your attn & appropriate action
23/2/15

T: 204 7950 **F:** 2404 7951

Dear Sir,

RE: LOWER USUTHU SMALL HOLDER IRRIGATION PROJECT (LUSIP) - PHASE II PROJECT

This serves to confirm that the Environmental and Social Impact Assessment (ESIA) study prepared for the LUSIP Phase II project has completed the process as per the Environmental Audit, Assessment and Review Regulations, 2000. It is considered that the studies undertaken have identified the environmental impacts associated with the proposed irrigated sugarcane development project and that the mitigation measures provided are satisfactory for the project implementation

SWADE is therefore authorized to implement the project subject to the following conditions;

1. The ESIA/CMP report shall be adhered to and used as a working document during the lifecycle of the project
2. Separate approval must be obtained from SEA for borrowing and spoiling of soil material
3. This approval does not supersede any other legal requirements that need to be met by the proposed development such as but not limited to irrigation water abstraction permits

Ensuring the integration of environmental concerns into Swaziland's development

Imvelo Yami, Yimphilo Yami

4. Unanticipated issues of environmental concern emerging at any stage of the implementation of LUSIP II project should be promptly reported to SEA.

We look forward to your continued cooperation

Yours sincerely

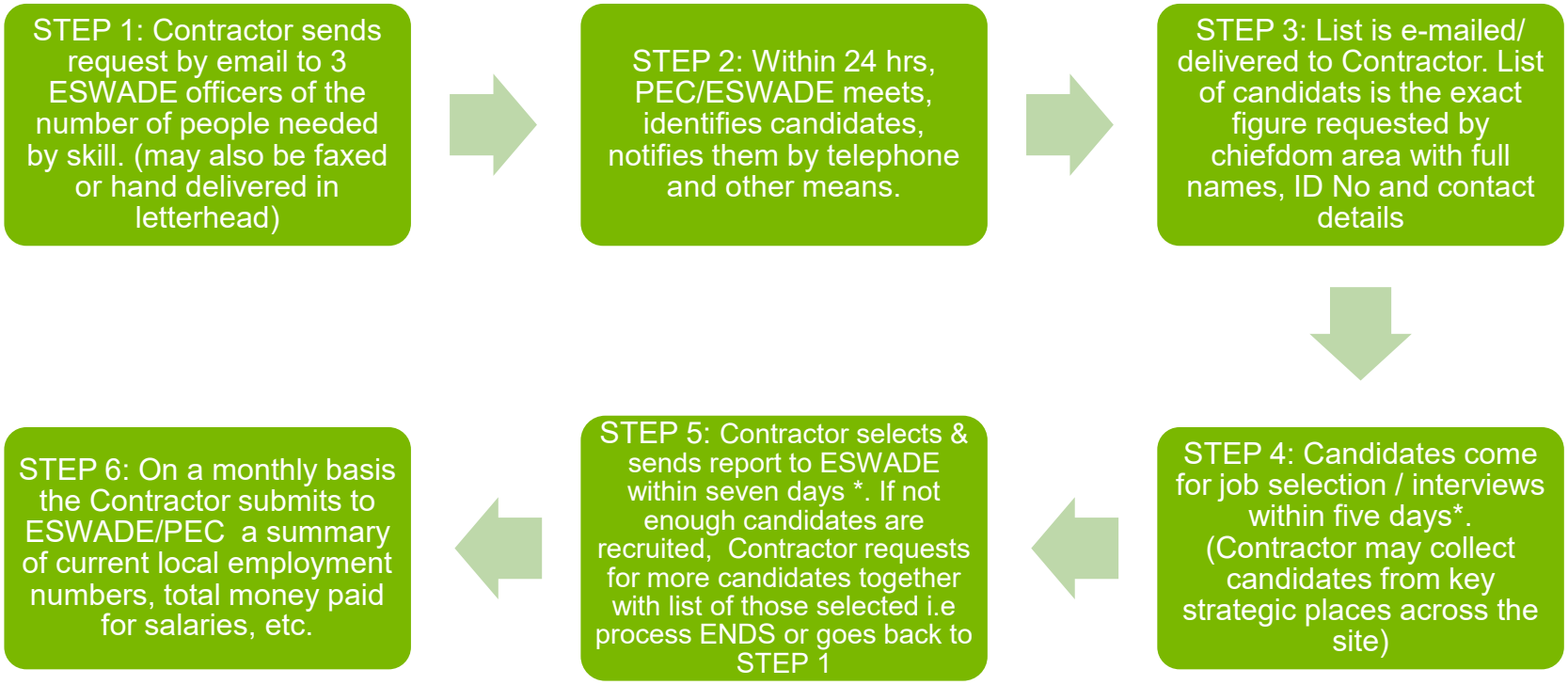
ISAAC G. DLADLA
ACTING EXECUTIVE DIRECTOR

Annex 5. Hiring Protocol

LUSIP II HIRING PROCEDURE FOR WORKERS RECRUITED FROM AFFECTED LOCAL COMMUNITIES TO BE MANAGED BY THE PEC, THE CONTRACTOR, EWADE AND THE CONSULTANT

1. **Employment Conditions**
   This is a procedure to be used by contractors whilst conducting work under LUSIP2 and in cooperation with the Project Employment Committee (PEC). The Contractors is that party who is contractually expected to hire local residents as part of their labour force.
   The contractor is to enforce the same procedure to be adhered to by all sub-contractors under their control.
2. **Objective**
   This procedure is intended to manage a fair, transparent and equitable distribution of job opportunities between the three chiefdoms (Ngcamphalala, Matsenjwa and Mngometulu) under all LUSIP II works.
3. **Nature**
   This procedure is an operational tool / working agreement and does not change terms of any other existing contracts that the parties may have with each other.
4. **Amendment of the Procedure**
   The procedure may be amended by a written agreement between the parties, where such changes clearly demonstrate an enhancement of the objective of this procedure.

1. **THE LOCALS' HIRING PROCEDURE:**



*Note: * The days stipulated above excludes Saturdays, Sundays and public holidays.*

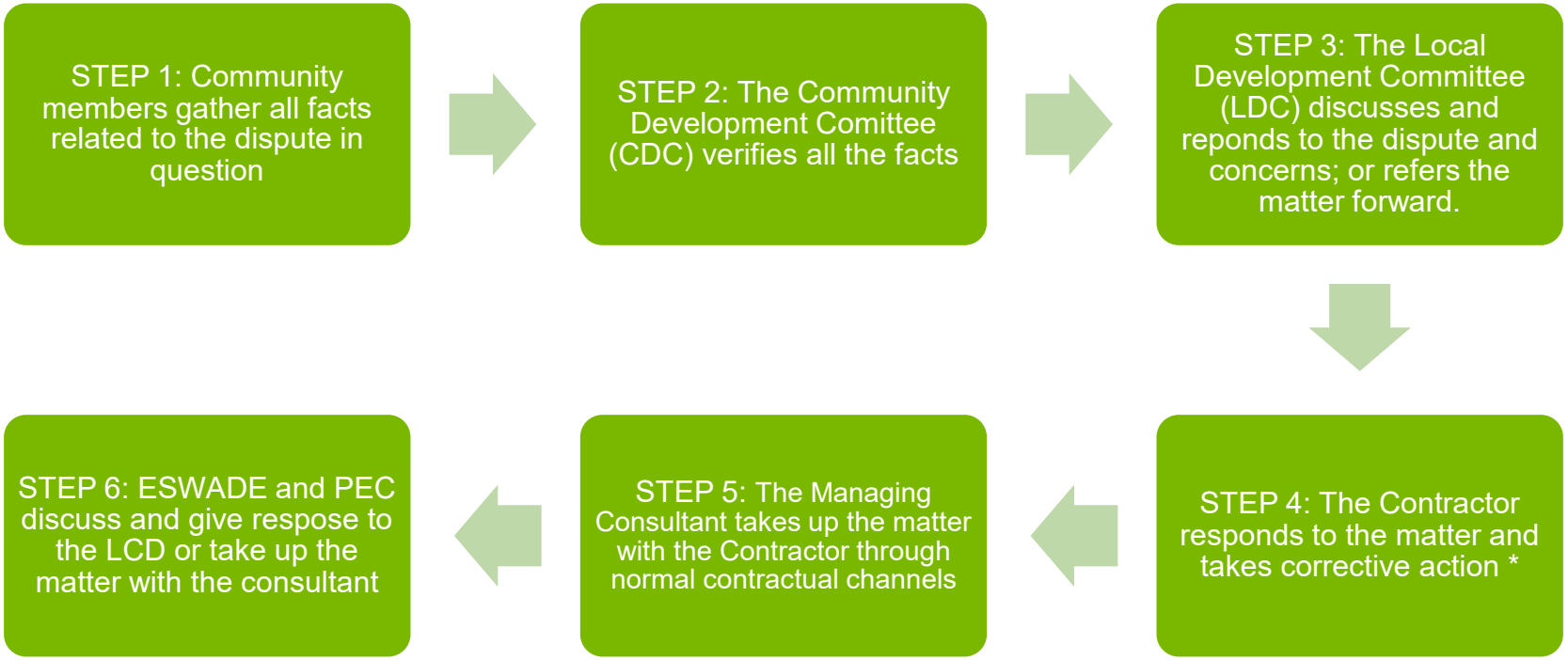
1. **Summary of the Procedure**
    - A 5-step process;
    - Takes not more than five days (minimum 72 hrs) from receipt of request for labour to candidates showing up for selection;
    - Notification of candidates before the list is sent will ensure that candidates show up for recruitment but may cause delays in the recruiting process. However, by identifying 30% more candidates than the number required by the Contractor should offset these delays;
    - A seven-day provision for the confirmation of hiring by the Contractor has been provided for as the recruitment process may take some time;
    - In the event of a Contractor installing a potable water scheme, only those local people directly benefiting from the scheme are to be hired by the Contractor for that work. This process will still need to be done through the PEC (if it is still in existence);
    - Notification of candidates for employment must be done through the official channels agreed between EWADE, PEC and the Contractor. The use of the Tribal Authority (TA) or Bandlancane should be avoided. The use of Community Development Structures (CDC) structures is strongly encouraged.
2. **Dispute Reporting and Resolution Procedure**

    As this procedure is intended as a fair and transparent manner to manage the hiring of local workers, it may be appreciated that it may not completely remove the risk of grievances and disputes with the affected local communities.

    This section provides for the reporting of such grievances and disputes with the communities regarding local employment issues. The most important aspect of reporting any grievances/ disputes is that the party reporting the grievance/ dispute must have and avail to all parties all the relevant facts related to the matter before reporting it.

    The process will be as follows: -

<u>The Dispute Procedure</u>



Note: * Response and update reporting takes place in the reverse order to the dispute procedure.

It should be noted that since the CDC, LDC and PEC are all community representative structures, they can be represented by the PEC, i.e. the community may report a grievance to the PEC, who will then discuss the matter, and if needed, then report to EWADE. EWADE may seek clarifications or report to the Consultant, who will then take up the matter with the Contractor.

Drawings

No	Title	Drawing No.
1	EMSELENI IRRIGATION LAYOUT	EWADE-0797-01
	LOCALITY MAP	EWADE -0797-02
	MAINLINE, SUB-MAINLINE AND LATERAL CONNECTION DETAILS - DRIP	GEN-0797-04
	LATERAL CONNECTION DETAILS - SPRINKLERS	GEN-0797-05
	SUB-MAINLINE, LATERAL AND DRIPPERLINE CONNECTION DETAILS - DRIP	GEN-0797-06
	BLOCK HYDRANT VALVE - DOUBLE SUPPLY	GEN-0797-07
	BLOCK HYDRANT VALVE - SINGLE SUPPLY	GEN-0797-08
	ISOLATION VALVE	GEN-0797-09
	AIR VALVE	GEN-0797-10
	SCOUR VALVE	GEN-0797-11
	TYPICAL PIPE TRENCH DETAILS	GEN-0797-12
	FIELD ROAD SECTIONS	GEN-0797-13
	FIELD DRAINAGE DETAILS	GEN-0797-14
	STREAM CROSSING DETAILS	GEN-0797-15
	PIPE ROUTE MARKER PLAN SECTION AND ELEVATION	GEN-0797-16

Activity Schedule/ Bills of Quantities

Activity Schedule

Date: 10th November 2026

Procurement Reference No.: *EWADE/0797*

Name of Contractor: *[Insert the name of the Contractor/Joint Venture/Consortium/Association]*

BUSH CLEARING, LAND PREPARATION, SUPPLY AND INSTALLATION OF IRRIGATION SYSTEM, TESTING AND

COMMISSIONING OF 10HA AT DINABANYE CHIEFDOM UNDER THE MATSANJENI SOUTH INKHUNDLA

CONTRACT NO. EWADE/0000 – CONSTRUCTION OF MNCELENI EARTH DAM		
ITEM NO.	**DESCRIPTION**	**AMOUNT (SZL)**
A	PRELIMINARY & GENERAL	
B	LAND PREP	
C	IRRIGATION	
D	SOLAR PUMP STATION	
E	WATER MAINS	
F	DAYWORKS	
G	SPARES	
SUB TOTAL		
ADD CONTINGENCY @ 5%		
Subtotal		
ADD: CIC Levy (…….%)		
Subtotal		
ADD: Value Added Tax (15%)		
Total Amount		

Item No.	Payment Refers	Description	Unit	Qty	Rate (SZL)	Amount (SZL)
		SECTION A: PRELIMINARY AND GENERAL ITEMS				
A1.1	**8.3**	**Fixed Charge Items**				
A1.1	8.3.1	Contractual requirements	Sum	1		
A1.2		Site establishment.	Sum	1		
	8.3.2.1	Facilities for the Engineer :				
A1.3		Supply and erect one contract notice board as per the drawing: EWADE-0000-01	Sum	1		
A1.4		Survey Equipment	Sum	1		
A1.5		Provion of a Double cab 4x4 Vehicle, 2.4 -2.8 L engine, 100-120 @ 3400-3800 (kW@r/min), 320-400 @ 2000-2500 (Nm@r/min), Manual/Automatic 6 speed, Diesel, fuel tank capacity 75L minimum, for the supervion of the project.	Sum	1		
A1.6		Facilities for Sub-Contractors	Sum	1		
A1.7		All other fixed charge obligations	Sum	1		
A1.8		Water supplies, electric power and communication	Sum	1		
A1.9		Removal of site establishment	Sum	1		
A1.2		**Time Related Items (Time related items will be paid for over the duration of the Contract in the ratio of work done to date to the total value of work to be executed in the sections excluding Section A. The final amount to be paid to be equal to 100%)**				
A1.2.1		Contractual requirements	Sum	1		
A1.2.2		Facilities for Sub-Contractors	Sum	1		
A1.2.3		Supervision for the duration of construction	Sum	1		
A1.2.4		Company and office overhead costs for the duration of the Contract	Sum	1		
A1.2.5		Any other value-related obligations	Sum	1		
A1.2.6		Double cab 4x4 Vehicle, for the supervion of the project. Cost to include all vehicle running cost, consumables, servicing, operation and maintenance, and keeping it at good states for the duration of the contract	Sum	1		
A1.3		**Sums Stated Provisionally by the Employer**				
A1.3.1		Provisional Sum: For testing ordered by the Employer and carried out by an independent laboratory or facility. (Note: All costs in connection with the sampling and testing of concrete shall be included in the Tenderer's rate for Concrete)	Prov. Sum	1	5,000.00	5,000.00
A1.3.2		Overhead charges and profit on Item A3.1 above	%			
A1.3.3		System Design, Administering the Procurement Process, Supervision, EMP Costs.	Prov. Sum	1	400,000.00	400,000.00
A1.3.4		Overhead charges and profit on Item A3.3 above	%			
A1.3.5		Employment of Community Liason for the duration of the contract	Prov. Sum	1	12,000.00	12,000.00
A1.3.6		Overhead charges and profit on Item A3.5 above	%			
A1.3.7		Service and purchase of spare parts for MoA - LUPD Surveying Equipment	Prov. Sum	1	70,000.00	70,000.00
A1.3.8		Overhead charges and profit on Item A3.7 above	%			
A1.4		**Other Preliminary and General Items**				
A1.4.1		Sum for as built drawings and Operations & Maintenance Manual (3 x A1 Copies & Electronic Copy (DWG's)	Sum	1		
Total Section A Carried To Summary						

BILLS OF QUANTITIES FOR IRRIGATION BULK CROPS						
ITEM NO.	PAYMENT REF	DESCRIPTION	UNIT	QTY	RATE (SZL)	AMOUNT (SZL)
B.1		**SECTION B – LAND PREPARATION AND FORMATION**				
		Carry out the following operation as applicable: Design, prepare drawings, check design calculations, manufacture, supply, deliver, install, construct, backfill, paint, finish, commission, test and attend to defects for the following items:				
	SANS1200 C	**Land Clearing**				
B.1.1	PG 2.1	Category 1: Cultivated land that has lied fallow for more than 5 yrs: Bush Clearing all trees, bush, grass incl. roads and loading zones	ha	12.00		
B.1.2	PG 2.2	Category 2: Cultivated land that has lied fallow for less than 5 yrs: Bush Clearing all trees, bush, grass incl. roads and loading zones	ha	1.00		
	SANS 1200 D	**Land Preparation**				
B.1.3		First rip to 500 mm depths at 1000 mm spacings	ha	10.00		
B.1.4		Cross rip at 600 mm depths 1000 mm spacings at 45° with first rip	ha	10.00		
B.1.5	PG 3	Root removal	ha	10.00		
B.1.6		Stones/Rocks removal	ha	10.00		
B.1.7		Heavy disc using “36” disc	ha	10.00		
B.1.8		Medium disc using “36” disc	ha	10.00		
B.1.9		Light disc using “26” disc	ha	10.00		
B.1.10		Ridging: 1,8 m centres with 250 mm furrow depth and within irrigation design and road/waterway limits (“m” shaped furrow for centre pivot irrigation)	ha	10.00		
B.1.11		Ridging: 1,9 m centres with 250 mm furrow depth and within irrigation design and road/waterway limits (“m” shaped furrow for drip irrigation)	ha	10.00		
B.1.12		Seed bed preparation for the planting of crops with 75 horse power tractor and implement to be specified by the Supervisor	ha	10.00		
	SANS 1200 DM	**Roads**				
B.1.13	PF 4.2	Construction of main haulage roads 4.0 m wide to specification including removal of 150 mm top soil forming, shaping, grading, scarification and removal of unsuitable material below road bed structure & gravelling to specification with a 5km free haul as per drawing Number GEN-0000-13	m	1,060.00		
B.1.14	PF 4.3	Construction of grassed secondary roads, shaping and grading	m	1,670.00		
TOTAL SECTION B.1 CARRIED TO SUMMARY						

ITEM NO.	PAYMENT REF	DESCRIPTION	UNIT	QTY	RATE (SZL)	AMOUNT (SZL)
		SECTION C – IRRIGATION MAINLINE (BULK CROPS)				
		Carry out the following operation as applicable: check design calculations, manufacture, supply, deliver, install, construct, backfill, paint, finish, commission, test and attend to defects and prepare as built drawings for the following items:				
	SANS1200 I	**Delivery Pipeworks**				
C,2,2		Supply and Install 6m long, 200mm diameter Galvanized steel Pipework with Tee off provisions of diameter 75mm for the mainline connection, with Flange adaptors, bends, Gasket, Bolts and Nuts, blank flange and all other necessary fittings to connect from the Outlet chamber. Supply pipe to the in-field delivery main pipeline. All materials and fittings to be hot dipped galvanised. Isolation valves (B/Fly Valves Gearbox)	No	1.00		
C,2,3		75 mm Non Return Valve c/w all fittings to connect into a 75 mm mainpipe	No	1.00		
C,2,4		50 mm Pressure Gauge on inlet and outlet pipework in the Isolation Valves, up to 10 bar range. Gauges to be mounted on varnished hardwood mounting attached to wall and labelled.	No	2.00		
		Isolation valves (B/Fly Valves Gearbox)				
C,2,5		80 mm Ø Isolation valve spigot ends to be installed at the Mainpipe c/w conctere valve chamber, c/w all required fittings to connect into a 75mm mainpipe. All in accordance with drawing number GEN - 0000 - 09	No	1.00		
	SANS 1200	**EARTHWORKS (PIPE TRENCHES)**				
	8.3.2 & PS	**Excavation**				
	8.3.2a	a) Excavate in all materials for trenches, backfill, compact and dispose of surplus unsuitable material for the following pipe diameter (Refere to drawing number GEN-0000-12				
C,2,6		75 mm Ø Class 6 mPVC pipe	m	550.00		
TOTAL SECTION 3A.2 CARRIED FORWARD						-

ITEM NO.	PAYMENT REF	DESCRIPTION	UNIT	QTY	RATE (SZL)	AMOUNT (SZL)
		Sub Total brought Forward				-
C,2,7	PS DB6.3	b) E/O item (a) for hard excavation	m3	104.00		
C,2,8	8.3.2c	c) Excavate and dispose of unsuitable material from trench bottom	m3	370.00		
	SANS 1200 L	**Pipe Bedding**				
	8.2.1	Provision of bedding from trench excavations. Refere to drawing number GEN-0000-12				
C,2,9	PS LB1	a)Selected granular material for class B bedding	m3	75.00		
C,2,10		b)Selected fill material	m3	249.00		
	SANS1200	**Pipes**				
	8.2.1 & PS L5	Supply, Lay, and provide Bedding Pipes c/w Couplings (Pipes and fittings should be SABS/ISO approaved, and of simillar pressure rating). As shown in drawing number GEN-0000-19.				
C,2,11		75 mm Ø Class 6 mPVC pipe	m	550		
		HOT DIPP GALVANISED TEES, CAST IRON ADAPTERS				
C,2,12		200 x75 Ø Cast iron reducing tee	No	1		
C,2,13		75 mm VJ flange adapter	No	2		
		PVC Bends 90°				
C,2,14		ND 75 mm	No.	2		
TOTAL SECTION 3A.2 CARRIED FORWARD						

ITEM NO.	PAYMENT REF	DESCRIPTION	UNIT	QTY	RATE (SZL)	AMOUNT (SZL)
		Sub Total brought Forward				
		Bends 45°				
C,2,15		ND 75 mm	No.	2		
		Bends 22.5°				
C,2,16		ND 75 mm	No.	1		
	PS L1.3.2	**PVC Flanged Adaptor for mainline**				
C,2,17		80 mm Ø steel flanged Adaptor / 75 mm PVC pipe	No	1.00		
	PPS A1.2	**Combination Air Release valves on mainline**				
		Air Release valves, 50 mm, c/w a Tee piece connection as in.(Refere to drawing number GEN-0000-10) :				
C,2,18		75 mm Ø pipe	No	2.00		
		Isolation/gate valves (B/Fly Valves Gearbox) c/w concrete valve chamber				
C,2,19		75 mm Ø Isolation valve spigot ends c/w all necessary fittings to connect into an mPVC pipe and conceter chamber with lid. All in accordance with drawing number GEN-0000-09	No	2.00		
		General Items				
C,2,20		Supply and install pipe line markers every 100 m, or change of direction, intersection, roads crossing, change of direction in vertical lane, air valves, cscour valves etc.(Refere to drawing number GEN-0000- 16)	No	6.00		
C,2,21	PS L2.1	Prepare surfaces and cast concrete for anchor thrust blocks at fittings as necessary, 25/19 MPa concrete including formwork and reinforcement (Refere to drawing number GEN – 0000 – 19)	m^3	9.00		

TOTAL SECTION 3A.2 CARRIED FORWARD						
ITEM NO.	PAYMENT REF	DESCRIPTION	UNIT	QTY	RATE (SZL)	AMOUNT (SZL)
		Sub Total brought Forward				-
		SECTION 3A.5 – SUB-MAINS & IN-FIELD EQUIPMENT: SPRINKLER				
		Carry out the following operation as applicable: Check design calculations, sizes, quantities, manufacture, supply, deliver, install,				
	SANS 1200	**EARTHWORKS (PIPE TRENCHES)**				
	8.3.2 & PS	a) Excavate in all materials for trenches, backfill, compact and dispose of surplus unsuitable material for the following pipe diameter				
C,2,22		75 mm Ø Class 6 mPVC pipe	m	900		
C,2,23		63 mm Ø Class 6 mPVC pipe	m	290		
C,2,24		50 mm Ø Class 6 mPVC pipe	m	980		
C,2,25		b) hardrock excavation	m³	10		
C,2,26		c) Excavate and dispose of unsuitable material from trench bottom	m³	10		
		Supply and installation of a Drip irrigation system including sub-main pipes, hydrant valves, laterals and complete surface equipment &				
	SANS 1200	**Pipes**				
	8.2.1 & PS	Supply, Lay, and bedding of pipes, c/w couplings (Pipes and fittings should be SANS/ISO approved)				
C,2,27		75 mm Ø Class 6 mPVC pipe	m	900.00		
C,2,28		63 mm Ø Class 6 mPVC pipe	m	290.00		
C,2,29		50 mm Ø Class 6 mPVC pipe	m	980.00		
		PVC Reducers - PVC Fittings Class 9				
C,2,30		75 mm x 63 mm Ø PVC Reducer	No	4.00		
C,2,31		63 mm x 50 mm Ø PVC Reducer	No	4.00		
		PVC Bends All Class 9				
C,2,32		Bends 90°				
C,2,33		ND 63 mm	No.	1		
C,2,34		ND 50 mm	No.	1		
		Bends 45°				
C,2,35		ND 63 mm	No.	2		
C,2,36		ND 50 mm	No.	4		
		PVC TEES				
C,2,37		63 Equal Tee	No.	2		
C,2,38		50 Equal Tee	No.	2		
SUB-TOTAL CARRIED FORWARD						

ITEM NO.	PAYMENT REF	DESCRIPTION	UNIT	QTY	RATE (SZL)	AMOUNT (SZL)
		SUB-TOTAL BROUGHT FORWARD				
		80mm Ø Hydrant Valve Assembly				
C,2,39		80mm Bermad Valve	No	2.00		
C,2,40		80mm Galv Standpipe x 1m	No	4.00		
C,2,41		80mm Galv Nipple	No	6.00		
C,2,42		80mm Galv Tee	No	4.00		
C,2,43		80mm Galv Union	No	4.00		
C,2,44		80 x 25mm Galv Reducing Bush	No	6.00		
C,2,45		25mm Galv nipple	No	6.00		
C,2,46		25mm Hydromatic	No	4.00		
C,2,47		80mm Galv Elbow F/F	No	8.00		
C,2,48		90 x 3" PVC male adapter PN16	No	2.00		
C,2,49		50mm Ari Barak Airvalve Screwed	No	2.00		
		50mm Ø Hydrant Valve Assembly				
C,2,50		50mm Bermad Valve	No	2.00		
C,2,51		50mm Galv Standpipe x 1m	No	4.00		
C,2,52		50mm Galv Nipple	No	6.00		
C,2,53		50mm Galv Tee	No	4.00		
C,2,54		50mm Galv Union	No	4.00		
C,2,55		50 x 25mm Galv Reducing Bush	No	6.00		
C,2,56		25mm Galv nipple	No	6.00		
C,2,57		25mm Hydromatic	No	4.00		
C,2,58		50mm Galv Elbow F/F	No	8.00		
C,2,59		500 x 3" PVC male adapter PN16	No	2.00		
C,2,60		50mm Ari Barak Airvalve Screwed	No	2.00		
		Saddle for Lateral Offtakes				
		Ømm x 32 mm(1-1/4") PVC Saddle Assembly, female threaded, T configuration complete with all the necessary fittings to connect saddle to lateral including riser and tees or elbows.				
C,2,61		75 mm Ø x 32 mm(1-1/4") PVC Saddle Assembly, female threaded	No	4.00		
C,2,62		63 mm Ø x 32 mm(1-1/4") PVC Saddle Assembly, female threaded	No	8.00		
C,2,63		50 mm Ø x 32 mm(1-1/4") PVC Saddle Assembly, female threaded	No	16.00		
C,2,64		32 mm compression elbow	No.	24.00		
C,2,65		32 Ø x 1000mm long hdpe class 6	No.	24.00		
C,2,66		32 mm compresssion male adaptor	No.	24.00		
	8.1.13 & PPS A1.1	**Scour / Flashing Valves**				
C,2,67		50 mm Ø Flushing Valve Assembly	No	16.00		
C,2,68		32mm HDPE Class 10	m	2,550.00		
C,2,69		Lateral riser valve assembly ¾" complete with 32mm x 25 plasson saddle, 300mm x 25 HDPE class 10 stand pipe and nylon Risomatic valve	No	160.00		
C,2,70		32 mm Ø Plasson End Cap	No	16.00		
C,2,71		32mm Couplings	No	26.00		
C,2,72		Typical Sprinkler Assembly complete with 2m hose, hose clamps, 1.5m tripod, sprinkler, nozzle and plug (35m operating pressure). Sprinkler model to be approved.	No	11.00		
		General Items				
C,2,73		Prepare surfaces and cast concrete for anchor thrust block at fittings as necessary, 25/19 Mpa concrete strenght, including formwork and reinforcement. Refer to drawing number GEN - 0000 - 19	m³	5.00		
C,2,74		Supply and install pipe line markers every 100 m, or change of direction, intersection, roads crossing, and air valves, scour valves and change of direction in vertical plane. Refer to drawing number GEN - 0000- 16	No	7.00		
C,2,75		Detailed Spraying Program	Sum	1.00	105,000.00	105,000.00
	SANS 1200	**Provision for bedding**				
C,2,76	8.2.1	a) Selected granular bedding material for class B bedding	m³	155.00		
C,2,77		b) Selected fill material for blanket	m³	210.00		
		TOTAL SECTION 3A.4 CARRIED TO SUMMARY				

ITEM NO.	PAYMENT REF	DESCRIPTION	UNIT	QTY	RATE (SZL)	AMOUNT (SZL)
		SCHEDULE D: SOLAR PUMP STATION				
		DESIGN AND BUILD				
D1		**Pumphouse**				
D1.1		Design, manufacture, supply and installation and commission of pump house including all pump station including internal lighting, external solar lights and all associated accessories. as detailed in drawing EWADE 0000	Sum	1.00		
D2		**Pump**				
D2.1		Design, manufacture, Supply, install, test and commission a complete centrifugal pumping unit rated at 6 L/s (21.6 m³/hr) at 60 m Total Dynamic Head, complete with 5.5 kW (7.5 HP) three-phase motor, Variable Speed Drive (VSD), baseplate, flexible coupling, suction and delivery pipework connections, isolation valves, non-return valve pressure gauges control panel, protection devices, cabling and all accessories required for a complete operational installation, as detailed in drawing EWADE 0000	Sum	1.00		
D3						
D3.1		Design, manufacture, supply and installation of a 7 kW solar panel system, complete with mounting structure, PV combiner, PV disconnect, PV protection, cabling, fencing, security lighting and lightning protection as detailed in drawing EWADE 0001	sum	1.00		
TOTAL SOLAR PUMP STATION: CARRIED TO SUMMARY						

ITEM NO.	PAYMENT REF	DESCRIPTION	UNIT	QTY	RATE (SZL)	AMOUNT (SZL)
E		**SECTION E – WATER MAINS MAHLABENENI**				
		Carry out the following operation as applicable: check design calculations, manufacture, supply, deliver, install, construct, backfill, paint, finish, commission, test and attend to defects and prepare as built drawings for the following items:				
	SANS1200 L	**Supply and Delivery of Pipes and Fittings**				
		Supply & deliver: Supply and deliver the specified SABS-approved UPVC pipe PN 12, fitting or valve complete, including procurement, transport, off-loading and safe storage.				
E.1.1		140 mm Ø Class 12 uPVC pipe	m	60.00		
E.1.2		125 mm Ø Class 12 uPVC pipe	m	60.00		
E.1.3		110 mm Ø Class 12 uPVC pipe	m	60.00		
E.1.4		90 mm Ø Class 12 uPVC pipe	m	60.00		
E.1.5		75 mm Ø Class 12 uPVC pipe	m	60.00		
E.1.6		63 mm Ø Class 12 uPVC pipe	m	60.00		
		Supply & deliver: Supply and deliver the specified SABS-approved HDPE pipe PN 10, fitting or valve complete, including procurement, transport, off-loading and safe storage.				
E.1.7		50 mm Ø Class 10 HDPE pipe	m	300.00		
E.1.8		40 mm Ø Class 10 HDPE pipe	m	300.00		
E.1.9		32 mm Ø Class 10 HDPE pipe	m	500.00		
E.1.10		25 mm Ø Class 10 HDPE pipe	m	200.00		
		uPVC Couplings				
E.1.11		140mm uPVC SABS-approved fittings.All fittings shall be PN 16 or above.	No.	10.00		
E.1.12		125mm uPVC SABS-approved fitting. All fittings shall be PN 16 or above.	No.	10.00		
E.1.13		110mm uPVC SABS-approved fittings.All fittings shall be PN 16 or above.	No.	10.00		
E.1.14		90mm uPVC SABS-approved fittings.All fittings shall be PN 16 or above.	No.	10.00		
E.1.15		75mm uPVC SABS-approved fittings.All fittings shall be PN 16 or above.	No.	10.00		
E.1.16		63mm uPVC SABS-approved fittings.All fittings shall be PN 16 or above.	No.	10.00		
TOTAL SECTION 4A.1 CARRIED FORWARD						

ITEM NO.	PAYMENT REF	DESCRIPTION	UNIT	QTY	RATE (SZL)	AMOUNT (SZL)
		Sub Total brought Forward				
		HDPE Couplings				
E.1.17		50mm HDPE SABS-approved fittings.All fittings shall be PN 16 or above.	No.	50.00		
E.1.18		40mm HDPE SABS-approved fittings.All fittings shall be PN 16 or above.	No.	50.00		
E.1.19		32mm HDPE SABS-approved fittings.All fittings shall be PN 16 or above.	No.	50.00		
E.1.20		25mm HDPE SABS-approved fittings.All fittings shall be PN 16 or above.	No.	150.00		
		G.S Nipples				
E.1.21		50mm barrel nipple	No.	20.00		
E.1.22		25mm barrel nipple	No.	16.00		
		AIR VALVES				
E.1.23		50mm Double orifice Air Valve	No.	10.00		
E.1.24		25mm Double orifice Air Valve	No.	5.00		
		SADDLES				
E.1.25		140 mm Ø x 20 mm(1-1/4") PVC Saddle Assembly, female threaded	No.	5.00		
E.1.26		125 mm Ø x 20 mm(1-1/4") PVC Saddle Assembly, female threaded	No.	5.00		
E.1.27		110 mm Ø x 20 mm(1-1/4") PVC Saddle Assembly, female threaded	No.	5.00		
E.1.28		90mm Ø x 20 mm(1-1/4") PVC Saddle Assembly, female threaded	No.	5.00		
E.1.29		75 mm Ø x 20 mm(1-1/4") PVC Saddle Assembly, female threaded	No.	5.00		
E.1.30		63 mm Ø x 20 mm(1-1/4") PVC Saddle Assembly, female threaded	No.	5.00		
		ADAPTORS				
	PS L1.3.2	**PVC Flanged Adaptor for mainline**				
E.1.31		80 mm Ø steel male Adaptor / 75 mm PVC pipe	No.	6.00		
E.1.32		80 mm Ø steel male Adaptor / 90 mm PVC pipe	No.	6.00		
E.1.33		100 mm Ø steel male Adaptor / 110 mm PVC pipe	No.	6.00		
E.1.34		150 mm Ø steel male Adaptor / 125 mm PVC pipe	No.	6.00		
		uPVC Bends 90°				
E.1.35		ND 75 mm	No.	5.00		
E.1.36		ND 90 mm	No.	5.00		
E.1.37		ND 110 mm	No.	5.00		
E.1.38		ND 125 mm	No.	5.00		
		Bends 45°				
E.1.39		ND 75 mm	No.	2.00		
E.1.40		ND 90 mm	No.	5.00		
E.1.41		ND 110 mm	No.	5.00		
E.1.42		ND 125 mm	No.	5.00		
		Bends 22.5°				
E.1.43		ND 75 mm	No.	1.00		
E.1.44		ND 90 mm	No.	5.00		
E.1.45		ND 110 mm	No.	5.00		
E.1.46		ND 125 mm	No.	5.00		
	PS L1.3.2	**PVC Flanged Adaptor for mainline**				
E.1.47		80 mm Ø steel male Adaptor / 75 mm PVC pipe	No	6.00		
E.1.48		80 mm Ø steel male Adaptor / 90 mm PVC pipe	No	6.00		
E.1.49		100 mm Ø steel male Adaptor / 110 mm PVC pipe	No	6.00		
E.1.50		150 mm Ø steel male Adaptor / 125 mm PVC pipe	No	6.00		
		GATE VALVES				
E.1.51		100mm brass gate valve	No	5.00		
E.1.52		80mm brass gate valve	No	5.00		
E.1.53		65mm brass gate valve	No	5.00		
E.1.54		50mm brass gate valve	No	5.00		
E.1.55		40mm brass gate valve	No	5.00		
E.1.56		32mm brass gate valve	No	5.00		
		Rehabilitation Works				
		Excavate trench or repair pit, including safe support, spoil handling and careful exposure of existing services.Install / lay: Install, lay and joint item to line and level, including handling, cutting, alignment, supports, bedding adjustment and connection to existing pipework. Backfill with approved selected material in layers, compact and reinstate the disturbed surface. Pressure and leakage test the completed work, rectify defects, disinfect where required and commission.				
E.1.57		140 mm Ø Class 12 uPVC pipe	m	60.00		
E.1.58		125 mm Ø Class 12 uPVC pipe	m	60.00		
E.1.59		110 mm Ø Class 12 uPVC pipe	m	60.00		
E.1.60		90 mm Ø Class 12 uPVC pipe	m	60.00		
E.1.61		75 mm Ø Class 12 uPVC pipe	m	60.00		
E.1.62		63 mm Ø Class 12 uPVC pipe	m	60.00		
E.1.63		50 mm Ø Class 10 HDPE pipe	m	300.00		
E.1.64		40 mm Ø Class 10 HDPE pipe	m	300.00		
E.1.65		32 mm Ø Class 10 HDPE pipe	m	500.00		
E.1.66		25 mm Ø Class 10 HDPE pipe	m	200.00		
OTAL SECTION 4A.1 CARRIED FORWARD						

ITEM NO.	PAYMENT REF	DESCRIPTION	UNIT	QTY	RATE (SZL)	AMOUNT (SZL)
		Sub Total brought Forward				
		uPVC Couplings				
E.1.67		140mm uPVC SABS-approved fittings.All fittings shall be PN 16 or above.	No.	10.00		
E.1.68		125mm uPVC SABS-approved fitting. All fittings shall be PN 16 or above.	No.	10.00		
E.1.69		110mm uPVC SABS-approved fittings.All fittings shall be PN 16 or above.	No.	10.00		
E.1.70		90mm uPVC SABS-approved fittings.All fittings shall be PN 16 or above.	No.	10.00		
E.1.71		75mm uPVC SABS-approved fittings.All fittings shall be PN 16 or above.	No.	10.00		
E.1.72		63mm uPVC SABS-approved fittings.All fittings shall be PN 16 or above.	No.	10.00		
		HDPE Couplings				
E.1.73		50mm HDPE SABS-approved fittings.All fittings shall be PN 16 or above.	No.	50.00		
E.1.74		40mm HDPE SABS-approved fittings.All fittings shall be PN 16 or above.	No.	50.00		
E.1.75		32mm HDPE SABS-approved fittings.All fittings shall be PN 16 or above.	No.	50.00		
E.1.76		25mm HDPE SABS-approved fittings.All fittings shall be PN 16 or above.	No.	150.00		
		G.S Nipples				
E.1.77		50mm barrel nipple	No.	20.00		
E.1.78		25mm barrel nipple	No.	16.00		
		AIR VALVES				
E.1.79		50mm Double orifice Air Valve	No.	10.00		
E.1.80		25mm Double orifice Air Valve	No.	5.00		
		SADDLES				
E.1.81		140 mm Ø x 20 mm(1-1/4") PVC Saddle Assembly, female threaded	No.	5.00		
E.1.82		125 mm Ø x 20 mm(1-1/4") PVC Saddle Assembly, female threaded	No.	5.00		
E.1.83		110 mm Ø x 20 mm(1-1/4") PVC Saddle Assembly, female threaded	No.	5.00		
E.1.84		90mm Ø x 20 mm(1-1/4") PVC Saddle Assembly, female threaded	No.	5.00		
E.1.85		75 mm Ø x 20 mm(1-1/4") PVC Saddle Assembly, female threaded	No.	5.00		
E.1.86		63 mm Ø x 20 mm(1-1/4") PVC Saddle Assembly, female threaded	No.	5.00		
		ADAPTORS				
	PS L1.3.2	**PVC Flanged Adaptor for mainline**				
E.1.87		80 mm Ø steel male Adaptor / 75 mm PVC pipe	No.	6.00		
E.1.88		80 mm Ø steel male Adaptor / 90 mm PVC pipe	No.	6.00		
E.1.89		100 mm Ø steel male Adaptor / 110 mm PVC pipe	No.	6.00		
E.1.90		150 mm Ø steel male Adaptor / 125 mm PVC pipe	No.	6.00		
		uPVC Bends 90°				
E.1.91		ND 75 mm	No.	5.00		
E.1.92		ND 90 mm	No.	5.00		
E.1.93		ND 110 mm	No.	5.00		
E.1.94		ND 125 mm	No.	5.00		
		Bends 45°				
E.1.95		ND 75 mm	No.	2.00		
E.1.96		ND 90 mm	No.	5.00		
E.1.97		ND 110 mm	No.	5.00		
E.1.98		ND 125 mm	No.	5.00		
		Bends 22.5°				
E.1.99		ND 75 mm	No.	1.00		
E.1.100		ND 90 mm	No.	5.00		
E.1.101		ND 110 mm	No.	5.00		
E.1.102		ND 125 mm	No.	5.00		
	PS L1.3.2	**PVC Flanged Adaptor for mainline**				
E.1.103		80 mm Ø steel male Adaptor / 75 mm PVC pipe	No	6.00		
E.1.104		80 mm Ø steel male Adaptor / 90 mm PVC pipe	No	6.00		
E.1.105		100 mm Ø steel male Adaptor / 110 mm PVC pipe	No	6.00		
E.1.106		150 mm Ø steel male Adaptor / 125 mm PVC pipe	No	6.00		
		Isolation/gate valves				
E.1.107		100 mm Ø Isolation valve spigot ends c/w all necessary fittings	No	5.00		
E.1.108		80 mm Ø Isolation valve with spigot ends, complete with all necessary fittings	No	5.00		
E.1.109		65 mm Ø Isolation valve spigot ends c/w all necessary fittings	No	5.00		
E.1.110		50 mm Ø Isolation valve spigot ends c/w all necessary fittings	No	5.00		
E.1.111		40 mm Ø Isolation valve spigot ends c/w all necessary fittings	No	5.00		
E.1.112		32 mm Ø Isolation valve spigot ends c/w all necessary fittings	No	5.00		
		TOTAL SECTION 4A.1 CARRIED TO SUMMARY				

MNCELENI EARTHDAM DAYWORKS SCHEDULE						
Item No.	**Payment**	**Description**	**Unit**	**Quantity**	**Rate (SZL)**	**Amount (SZL)**
F1	8.7.1	**SECTION F: DAYWORKS**				
		Normal :				
F1.1		(i) Supervisor	hr	20		
F1.2		(ii) Artisan	hr	40		
F1.3		(iii) Operator	hr	30		
F1.4		(iv) Labourer	hr	100		
F1.5		Overtime including Sundays :				
F1.6		(i) Supervisor	hr	20		
F1.7		(ii) Artisan	hr	20		
F1.8		(iii) Operator	hr	30		
F1.9		(iv) Labourer	hr	100		
F2	8.7.2	**Plant**				
F2.1		Crawler tractors with blade and ripper :				
F2.2		(i) Smaller than 200kW	hr	6		
F2.3		Self propelled motor grader type				
F2.4		120 - 148 kW	hr	10		
F2.5		Front end loader of 1.5 m3 capacity				
F2.6		Tractor , loader , backactor of 0.5 m3	hr	6		
F2.7		capacity	hr	6		
F2.8		Tip trucks or dumpers of :				
F2.9		(i) 5 m3 capacity	hr	6		
F2.10		(ii) 10 m3 capacity	hr	6		
F2.11		Flat steel wheel roller of 7 ton capacity	hr	0		
F2.12		Pneumatic-tyred roller of 12 ton capacity	hr	6		
F2.13		Vibratory roller	hr	6		
F2.14		10 000 litre water tanker	hr	8		
F2.15		Excavator (Cat330 or equivalent)	hr	8		
F2.16		Pedestrian roller	hr	8		
F2.17		Mobile compressor, 4.7 cu.m/min, including hoses and tools	hr	8		
		TOTAL CARRIED TO SUMMARY				

Item No.	Payment Ref	Description	Unit	Quantity	Rate (SZL)	Amount (SZL)
G		SECTION G: SPARES & TOOLS				
G.01		Pipe Wrench 450mm	No	1		
G.02		Pipe Wrench 350mm	No	1		
G.03		Set of Ring Spanners Size 8 to 24	No	1		
G.04		Screwdrivers Flat 3mm to 10mm	No	1		
G.05		Screwdrivers Star 3mm to 10mm	No	1		
G.06		Water Pump Plyers 240mm	No	1		
G.07		Hammer Claw - 500g	No	1		
G.08		Hammer Club - 2kg	No	1		
G.09		Hacksaw (All steel)	No	1		
G.10		Hacksaw blades	No	10		
G.11		Rain Gauge	No	2		
G.12		Temp meter Min and Max	No	1		
G.13		Cammelian Moisture sensors set (3 sensors per set)	No	22		
G.14		Channel iron Moisture sensor reader	No	2		
SCHEDULE G : TOTAL CARRIED TO SUMMARY OF SCHEDULES						

Completion Schedule

The Contractor should indicate the project timelines that shows the sequence of activities required to finish a project:

Supplementary Information

Not Applicable

PART 3 - Contract
Section 7: General Conditions of Contract for the Procurement of Works

CONDITIONS OF CONTRACT

The General Conditions of Contract for Construction Works, Third Edition, 2015, published by the South African Institution of Civil Engineering, Private Bag X200, Halfway House, 1685, is applicable to this Contract and is obtainable from www.saice.org.za.

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Section 8: Special Conditions of Contract

The following Special Conditions of Contract (SCC) shall supplement the General Conditions of Contract (GCC). Whenever there is a conflict, the provisions herein shall prevail over those in the GCC.

GCC Clause Reference	Special Conditions
	Procurement Reference No: EWADE/0797
Clause 1.1.1.15	The name of the Employer is Eswatini Water & Agricultural Development Enterprise (EWADE)
Clause 1.1.1.29	The Site is located at Dinabanye Chiefdom under the Matsanjeni South Inkhundla and is defined in Drawings No.: EWADE-0797-02
Clause 1.1.15	The Start Date shall be: _____
Clause 1.1.1.16	The Employers Agent is: _____
Clause 1.1.1.4	The following documents also form part of the Contract: (i)Agreements and contract data, ii) Pricing data, iii) Scope of work iv) Site information
Clause 1.1.1.13	The Defects Liability Period is 12 Months from the date of the Certificate of Completion.
Clause 5.16.3	The latent defect period is 5 years
Clause 1.1.1.10	This Contract is a Unit Price Contract.
Clause 5.14.7	Sectional completion shall be permitted.
Clause 1.2.1.2	For **notices**, the PE's address shall be: Attention: Procurement Manager Physical address: Siphofaneni Telephone: 00 268 2411 8600 Electronic mail address: ewade@ewade.co.sz For **notices**, the Contractor's address shall be: Attention: _____ Physical Address: _____ Telephone: _____ Electronic mail address: _____
Clause 1.1.1.26	The Pricing Strategy is the Bill of Quantities
Clause 1.1.1.28	The Works consist of: Bush Clearing, Land Preparation, Supply and Installation of Irrigation System, Testing and Commissioning

GCC Clause Reference	Special Conditions
Clause 1.3.2	The law which is to apply to the Contract and according to which the Contract is to be interpreted, shall be the law of Eswatini.
Clause 2.1.2.2	The Contractor shall be deemed knowledgeable in respect of environmental, hydrological and climatic conditions, particularly for the planning of the Temporary Works.
Clause 6.2	The time to deliver the Deed of Guarantee is within 14 days from the Commencement Date.
Clause 4.4.1	GCC Clause 4.4.1 on sub-contracting is modified as follows: The contractor can sub-contract a maximum of 20% of the works.
Clause 4.8.1	The Schedule of Other Contractors shall form part of the Contract.
Clause 5.3	The Contractor shall commence with executing the Works upon the Employers Agent Instruction to the Contractor.
Clause 5.3.1	The documentation required before commencement of Works execution are: ➢ Health and Safety Plan ➢ Environmental Management Plan ➢ Initial Program (refer to clause 5.6) ➢ Performance Security (refer to clause 6.2) ➢ Insurance (refer to clause 8.6)
Clause 5.3.2	The time required to submitting the required documentation before commencement of works is 14 days after receipt of Letter of Award.
Clause 5.4.2	The access and possession of Site shall not be exclusive to the Contractor but as set out in the Site information
Clause 5.5.1	The whole of the Works shall be completed within **Two (2) Consecutive Calendar Months.**
Clause 5.5.1	The Intended Completion Date for the whole of the Works shall be: _____
Clause 5.4.1	The Site Possession Date shall be: _____
Clause 8.6	The minimum insurance covers shall be: (a) The minimum cover for insurance of the Works, Plant and Materials is: SZL2,500,000.00 (b) The maximum deductible for insurance of the Works, Plant and Materials is: SZL2,500,000.00 (c) The minimum cover for insurance of Equipment is: SZL1,500,000.00 (d) The maximum deductible for insurance of Equipment is: SZL1,500,000.00 (e) The minimum cover for insurance of property is: SZL1,000,000.00 (f) The maximum deductible for insurance of property is: SZL1,000,000.00

GCC Clause Reference	Special Conditions
	(g) The minimum cover for personal injury or death insurance is: SZL1,500,000.00 (h) The maximum deductible for personal injury or death insurance is SZL1,500,000.00
Clause 5.6	The Contractor shall submit the Program for the Works within 14 days days/weeks of contract signature.
Clause 5.6.4	The period between Program updates is 30 days. The amount to be withheld for late submission of an updated Program is: SZL10,000.00
Clause 5.8.1	The special non-working days are Sundays and all Public Holidays in terms of The Public Holidays Act 1938 as amended
Clause 6.10.1	Statements of estimated value of works executed shall be on a monthly basis.
Clause 6.8.2	No price adjustment is allowed for in this contract.
Clause 6.8.3	Price adjustments for variations in the costs of special materials are not allowed
Clause 6.10.1.5	The percentage advance on materials not yet built into the Permanent Works is 80% (*To be supported by Original Invoices*)
Clause 6.10.3	The total amount of retention money shall not exceed 10% of the Contract price.
Clause 6.10.3	Retention Money Guarantee shall be required in the format presented in Section 4 – Tendering Forms of the Tendering Documents.
Clause 6.10.3	The Advance Payment will be repaid by deducting equal amounts from payments due to the Contractor each month during the period starting _____ months after the Start Date and ending _____ months after the Start Date. *Not Applicable*
Clause 6.2.	A Performance Security Shall be required. A Performance Security shall be for 10% of the Contract Price.
Clause 6.2.1	The standard form of Performance Security acceptable to the PE shall be an Unconditional Bank Guarantee in the format presented in Section 4 – Tendering Forms of the Tendering Documents.
Clause 7.8.3	The amount to be withheld for failing to produce "as built" drawings and/or operating and maintenance manuals by the date required is SZL50,000.00 Eswatini Lilangeni.
Clause 5.13.1	The Contractor shall be liable for the penalty at **SZL10,000.00** per day for every calendar day that elapses between the Completion Date and the actual date of Practical Completion. The maximum amount of liquidated damages for the whole of the Works is 10% Percent of the final Contract Price
Clause 6.10.6.2	Monies due to the Contractor which are not paid within 35 days shall incur interest, at the prime overdraft rate, as charged by the Contractor's Bank. *Not Applicable*

GCC Clause Reference	Special Conditions
Clause 8.1.1	The Contractor shall maintain sufficient Temporary Works to ensure the least possible inconvenience to other roads users or operators within the facility.
Clause 8.4.1.1	Add to the end the following text: "hereby indemnifies the Employer against any liability in respect of damage or physical loss of property of any person or injury or death of any person due to non-compliance with the Occupational Safety and Health Act of 2001, and"
Clause 10.4.2	Dispute resolution shall be by amicable settlement, failing which dispute shall be resolved by way of Adjudication Board.
Clause 10.5.3	The number of Adjudication Board members to be appointed is one.

Section 9: Contract Forms

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Contract Agreement

Procurement Reference No: EWADE/0797

THIS CONTRACT AGREEMENT made this _____ day of _____, _____, between _____of _____ (hereinafter "the Procuring Entity - PE"), of the one part, and _____ of _____ (hereinafter "the Contractor"), of the other part.

Whereas the PE is desirous that the Contractor executes _____ (hereinafter called "the Works") and the PE has accepted the Tender by the Contractor for the execution and completion of such Works and the remedying of any defects therein for the Contract Price of Eswatini Lilangeni _____.

NOW THIS CONTRACT AGREEMENT WITNESSETH AS FOLLOWS:

1. In this Contract Agreement, words and expressions shall have the same meanings as are respectively assigned to them in the Contract referred to.
2. The following documents shall be deemed to form and be read and construed as part of this Agreement. This Contract Agreement shall prevail over all other Contract documents.
   (a) the Contractor's Tender;
   (b) the Special Conditions of Contract;
   (c) the General Conditions of Contracts;
   (e) the Scope of works;
   (f) the Drawings; and
   (g) the completed Schedules.
3. In consideration of the payments to be made by the PE to the Contractor as indicated in this Contract, the Contractor hereby covenants with the Procuring Entity to execute and complete the Works and remedy any defects therein in conformity in all respects with the provisions of the Contract.
4. The PE hereby covenants to pay the Contractor in consideration of the execution and completion of the Works and the remedying of defects therein the Contract Price of _____ or such other sum as may become payable under the provisions of the Contract, at the times and in the manner prescribed by the Contract.
5. The Contract Price or such other sum as may be payable shall be paid _____ in Eswatini Lilangeni , _____ in _____ and _____ in _____.

IN WITNESS whereof the parties thereto have caused this Contract to be executed in accordance with the law specified in the Special Conditions of Contract on the day, month and year indicated above.

Signed by _____ (for the Procuring Entity)
Name: _____ Position: _____

In the presence of:
Name: _____ Position: _____
Signed by _____ (for the Contractor)
Name: _____ Position: _____

In the presence of:
Name: _____ Position: _____

Performance Security

Date: _____
Procurement Reference No: EWADE/0797

To: _____
WHEREAS _____ (hereinafter called "the Contractor") has undertaken, pursuant to the Contract referenced above, dated _____ to execute _____ (hereinafter called "the Contract");

AND WHEREAS it has been stipulated by you in the aforementioned Contract that the Provider shall furnish you with a demand guarantee issued by a financial institution for the sum specified therein as security for compliance with the Provider's performance obligations in accordance with the Contract;

AND WHEREAS the undersigned _____legally domiciled in *[insert* _____ (hereinafter the "Guarantor"}, have agreed to give the Contractor a security;

THEREFORE WE hereby affirm that we are Guarantors and responsible to you, on behalf of the Contractor, up to a total of _____such sum being payable in the types and proportions of currencies in which the Contract Price is payable, and we undertake to pay you, upon your first written demand declaring the Contractor to be in default under the Contract, without cavil or argument, any sum or sums within the limits of _____as aforesaid without your needing to prove or to show grounds or reasons for your demand or the sum specified therein.

We hereby waive the necessity of your demanding the said debt from the Contractor before presenting us with the demand.

We further agree that no change or addition to or other modification of the terms of the Contract or of the Works to be performed thereunder or of any of the Contract documents which may be made between you and the Contractor shall in any way release us from any liability under this Guarantee, and we hereby waive notice of any such change, addition, or modification.

This Guarantee shall remain in force up to and including _____*

This guarantee is subject to the Uniform Rules for Demand Guarantees, ICC Publication No. 758, except that Sub-article 20(a) is hereby excluded.

Name: _____

_____

* *Insert the date twenty-eight (28) days after the intended completion date as stated in SCC 22.1. In the event of an extension of the intended completion date, the Entity shall request for an extension of this guarantee from the contractor. The request for extension shall be in writing and must be made prior to the expiration date stated in the guarantee.*

In the capacity of _____

Signed: _____Duly authorized to sign the Performance Security for and on behalf of: _____

Dated on _____ day of _____, _____

Advance Payment Security

Date: _____
Procurement Reference No.: EWADE/0797

To: *[insert complete name and address of Procuring Entity]*
In accordance with the payment provision included in the Contract referenced above, in relation to advance payments, *[insert complete name and address of Contractor]* (hereinafter called "the Contractor") shall deposit with the PE a Bank Guarantee to guarantee its proper and faithful performance of the obligations imposed by said Clause of the Contract, in the amount of *[insert currency and amount of guarantee in words and figures].*

We, the undersigned *[insert complete name of Guarantor]*, legally domiciled in *[insert full address of Guarantor]* (hereinafter "the Guarantor"), as instructed by the Contractor, agree unconditionally and irrevocably to guarantee as primary obligator and not as surety merely, the payment to the PE on its first demand without whatsoever right of objection on our part and without its first claim to the Contractor, in the amount not exceeding *[insert currency and amount of guarantee in words and figures]*.

We further agree that no change or addition to or other modification of the terms of the Contract or of the Works to be performed there under or of any of the Contract documents which may be made between the PE and the Contractor, shall in any way release us from any liability under this Guarantee, and we hereby waive notice of any such change, addition, or modification.

This Security shall remain valid and in full effect from the date of the advance payment under the Contract until the PE receives full repayment of the same amount from the Contractor.

Name: _____In the capacity of _____
This guarantee is subject to the Uniform Rules for Demand Guarantees, ICC Publication No. 758, except that Sub-article 20(a) is hereby excluded.

Signed: _____
Duly authorized to sign the Payment Security for and on behalf of: _____
Dated on _____ day of _____, _____

Advance Payment Security

Date: _____
Procurement Reference No.: EWADE/0797

To: *[insert complete name and address of Procuring Entity]*
Fund: Embassy of the Republic of China (Taiwan) in the Kingdom of Eswatini
Contract: **Bush Clearing, Land Preparation, Supply and Installation of Irrigation System, Testing and Commissioning of 10 Ha at Dinabanye Chiefdom under the Matsanjeni South Inkhundla**

To: Chief Executive Officer
Eswatini Water and Agricultural Development Enterprise
P.O. Box 198
Siphofaneni

We have been informed that ……(hereinafter called the "Principal") ……
……..……..is your contractor under such Contract and wishes to receive early
payment of the retention money, for which the Contract requires him to obtain a guarantee.
At the request of the Principal, we ……(name of bank/financial institution) ……..……
hereby irrevocably undertake to pay you, the Beneficiary/Employer, any sum or sums not exceeding in total the amount of
……(the "guaranteed amount", say: 10% of the Accepted Contract Amount) ……
upon receipt by us of your demand in writing and your written statement stating:
a) that the Principal has failed to carry out his obligation(s) to rectify certain defect(s) for which he is responsible under the Contract, and
b) the nature of such defect(s).

At any time, our liability under this guarantee shall not exceed the total amount of retention money released to the Principal by you, as evidenced by your notices issued under Sub-clause 6.10 of the conditions of the Contract with a copy being passed to us.

Any demand for payment must contain your signature(s) which must be authenticated by your bankers or by a notary public. The authenticated demand and statement must be received by us at this office on or before (the date 70 days after the expected expiry of the Defects Notification Period for the Works) …(the "expiry date") ...……, when this guarantee shall expire and shall be returned to us.

We have been informed that the Beneficiary may require the Principal to extend this guarantee if the performance certificate under the Contract has not been issued by the date 28 days prior to such expiry date. We undertake to pay you such guaranteed amount upon receipt by us, within such period of 28 days of your demand in writing and your written statement that the Final Approval Certificate has not been issued, for reasons attributable to the Principal, and that this guarantee has not been extended.

This guarantee shall be governed by the laws of Eswatini and shall be subject to the Uniform Rules for Demand Guarantees, published as number 458 by the International Chamber of Commerce, except as stated above.

Signed: _____
Duly authorized to sign the Payment Security for and on behalf of: _____
Dated on _____ day of _____, _____

Disclaimer
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