ON BEHALF OF THE WESTERN CAPE DEPARTMENT OF AGRICULTURE

TENDER: 11/2026

UPPER KEURBOOMS RIVER: CONSTRUCTION OF EROSION PROTECTION STRUCTURES IN UPPER KEURBOOMS RIVER, SWELLENDAM

AUGUST 2026

CONTRACTOR	…… (NAME OFCONTRACTOR)
BID AMOUNT	……

CASIDRA SOC LTD

22 Louws Avenue
Southern Paarl
Western Cape
7646

Tel 021 863 5000

For office use only	**Version no: 2**	**Date: 8 December 2021**	
To be signed upon appointment of winning bidder to form the agreement between the parties			
Signature for **Casidra**		Signature for Contractor	

CONSTRUCTION OF EROSION PROTECTION STRUCTURES IN KEURBOOMS RIVER, SWELLENDAM

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KEURBOOMS RIVER: CONSTRUCTION OF EROSION PROTECTION STRUCTURES IN KEURBOOMS RIVER, SWELLENDAM

GENERAL REQUIREMENTS

The works, as described, is part of the Disaster Management Programme for the Keurbooms River situated 6 Kilometre north of Swellendam, Western Cape. The bid will be a measured bid for the works described and is to include material, labour and machinery. The works must be completed within a 11**-month** (definition as defined further) contract period.

The scope of works entails **the construction of 21 (twenty-one) gabion structures (groynes)** in the Keurbooms River over an approximate **distance of 1260 metres**.

Bidders must have a CIDB contractor grading designation of **6 CE** or higher.

The tender process is as follows:

BID DEADLINE: The closing date for the bid is **Friday 11 September 2026 Strictly @ 12:00**

Bids must be submitted in a sealed envelope marked as "**BID 11/2026 CONSTRUCTION OF EROSION PROTECTION STRUCTURES IN KEURBOOMS RIVER, SWELLENDAM**" and placed in the tender box available at Reception, **Casidra's** Head Office, **22 Louws Avenue, Southern Paarl.** No e-mailed, faxed, counter-to-counter courier or posted bids will be accepted.

It is preferred that bid document must be bound. Casidra cannot accept responsibility for lost single or stapled pages.

There will be a **compulsory site meeting**. The meeting will be held at the **Keurbooms River** situated in +(**GPS Co-ordinates: 34° 0'16.53"S 20°22'35.62"E)** on **18th of August 2026 at 11:00.** Please take note that bidders not attending the compulsory site meeting will not be eligible to submit a bid. A locality map (pdf format) with directions to the site is available on request.

Any deviations from the original tender document will be sent out as an addendum to the contractors attending the compulsory site meeting.

All queries should be referred to Supply Chain at tender@casidra.co.za

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KEURBOOMS RIVER: CONSTRUCTION OF EROSION PROTECTION STRUCTURES IN KEURBOOMS RIVER, SWELLENDAM

LIST OF DOCUMENTS

The following documents form an integral part of this contract:

A. **OBTAINABLE FROM THE S.A. FEDERATION OF CIVIL ENGINEERING CONTRACTORS AND THE SOUTH AFRICAN BUREAU OF STANDARDS, AS APPLICABLE.**

1. General Conditions of Contract for Construction Works (Third Edition) 2015.
2. The Standardised Specifications for Civil Engineering Construction of the S.A. Bureau of Standards as listed in the project specification.

B. **ISSUED TO TENDERERS**

3. This document described as **BID: 11/2026**
4. Baseline Risk Assessment
5. Health and Safety Specification
6. SABS 1200DK
7. WCDOA concrete abrasion coating for gabions spec version 1 June 2018
8. WCDOA gabion spec Version 5 June 2018
9. General specification for river rehabilitation works Rev 1 April 2016
10. The following loose drawings:

SRS 2024/01/001	:	Site location
SRS 2024-01-002	:	List of drawings – upper section
SRS 2024-01-003	:	Project layout – upper section
SRS 2024-01-004	:	Project – sub-layout1
SRS 2024-01-005	:	Project – sub-layout2
SRS 2024-01-006	:	Project – sub-layout3
SRS 2024-01-007	:	Project – sub-layout4

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SRS 2024-01-010	:	Groyne 1
SRS 2024-01-011	:	Groyne 2a
SRS 2024-01-012	:	Groyne 2b
SRS 2024-01-013	:	Groyne 2c
SRS 2024-01-014	:	Groyne 3a
SRS 2024-01-015	:	Groyne 3b
SRS 2024-01-016	:	Groyne 3c
SRS 2024-01-017	:	Groyne 3d
SRS 2024-01-018	:	Groyne 4a
SRS 2024-01-019	:	Groyne 4b
SRS 2024-01-020	:	Groyne 4c
SRS 2024-01-021	:	Groyne 4d
SRS 2024-01-024	:	Groyne 6b
SRS 2024-01-025	:	Groyne 6c
SRS 2024-01-026	:	Groyne 6d
SRS 2024-01-027	:	Groyne 6e
SRS 2024-01-028	:	Groyne 7a
SRS 2024-01-029	:	Groyne 7b
SRS 2024-01-030	:	Groyne 7c
SRS 2024-01-031	:	Groyne 7d
SRS 2024-01-032	:	Groyne 7e

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CONSTRUCTION OF EROSION PROTECTION STRUCTURES IN KEURSBOOMS RIVER, SWELLENDAM

SECTION 1: TENDER DATA

TD 1.1 UNIT PRICES

The Contractor shall enter a rate to each item in the schedule of quantities, whether quantities are stated or not.

The Contractor may not group items together and tender one lump sum for such group of items. The Contractor also may not indicate against any item that full compensation for such item has been included in another item. A rate of R0-00 shall be assumed for such items.

All rates shall **exclude** value added tax (VAT). Separate provision has been made in the summary of the schedule of quantities for the payment of value added tax. The final amount payable to the Contractor for value added tax shall be based on the final certified contract price.

The tendered rates and amounts shall however **include** all levies and other taxes and duties on all items to which they apply.

TD 1.2 CORRECTION OF RATES

The tendered amount will remain unchanged; however, the correction of arithmetical errors will be done by the adjustment of the rate or item price (or both) and will be done before the award of the contract to the successful bidder.

All tenders will thus be subjected to a rates analysis. If there are items which are not market related, they will also be adjusted in agreement with the bidder before the successful award of the contract to the successful bidder.

TD 2 FORM OF TENDER

All tenders shall be submitted on the offer portion of the Form of Offer and Acceptance incorporated into this document. The form of tender shall not be removed from this document. The complete document with all schedules duly completed and signed shall be submitted before the closing date and time of tender. The completion period shall be clearly stated on the appendix to the form of tender.

Mistakes made by the Contractor in the completion of the schedule of quantities, forms, etc., shall not be erased. A line shall be drawn through the incorrect entry and the correct entry shall be written above and the correction initialled by the Contractor. The use of

correction products such as Tipp-Ex is strictly forbidden. Failure to observe this rule may lead to the tender being disqualified.

TD 3 CHECKING OF TENDER DOCUMENTS

The Contractor shall satisfy himself that the set of contract documents is complete and in accordance with the index. If any page has been omitted or duplicated, or if the script or dimensions, or anything else in the contract documents is indistinct, or if doubt exists as to the meaning of any description, or if the contract document contains any obvious errors, the Contractor shall immediately notify the Employer's Agent accordingly, in writing, so that such discrepancy or indistinctness can be clarified and rectified, as the Employer or the Employer's Agent will not accept any responsibility or consider any claim in connection with such discrepancy or indistinctness, which are not rectified during the tender period.

The Contractor shall rectify, at his own cost, any work not complying with the contract documents and drawings due to the incorrect interpretation of the specifications and drawings.

TD 4 PERIOD OF VALIDITY

Tenders whether for a part of or for the whole of the works shall remain valid for a period of **90 days** after closing date of tenders.

TD 5 ACCEPTANCE OR REJECTION OF TENDERS

The Employer does not bind himself to accept the lowest or any tender and reserves the right to accept any tender. No reason for the acceptance or rejection of any tender will be given.

The outcome of the bid will be communicated to the bidders on their outcome except for the publication on e-tender and CIDB websites. Enquiries on the outcome can be made to the project manager as to improve the bidder's competitiveness, ensure correct and complete bids for future reference.

TD 6 ELIGIBILITY

Only the contractors who comply with the following prescribed bidding criteria are eligible to submit a bid.

TD 6.1 CIDB Registration

CIDB grading (for "construction" projects with a value of more than R500 000 only) "construction": in terms of this requirement of the CIDB Act means; the provision of a combination of goods and services arranged for the development, extension, installation, repair, maintenance, renewal, removal, renovation, alteration, dismantling, or demolition of a fixed asset including building and Employer's Agenting services.

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Only those bidders who are registered with the CIDB, in a contractor grading designation equal to or higher than a contractor grading designation determined in accordance with Table 5 of the Construction Industry Development Regulations, for a **6 CE** class of construction work, are eligible to have their tenders evaluated.

Joint ventures are eligible to submit tenders provided that:

1. Every member of the joint venture is registered with the CIDB;
2. The lead partner has a contractor grading designation in the (above indicated) class of construction work;
3. The combined contractor grading designation calculated in accordance with the Construction Industry Development Regulations is equal to or higher than a contractor grading designation determined in accordance with Table 9 of the Construction Industry Development Regulations.

Proof of registration must be appended to **Annexure G**.

Further Joint Venture criteria

- Tenders to note that if a joint venture is submitted, a JV CIDB contract must accompany this bid.
- The joint Venture must clearly state the percentage split of responsibilities and also list all the responsibilities / duties of each member of the Joint Venture.
- The work and obligations making up the contract must be broken down into discrete elements, or sections, usually on the basis of locality, the nature of the work, or the capabilities and resources required.
- Each element is assigned to a specific member of the joint venture who assumes full responsibility for its execution, under the direction of the joint venture must be indicated.

Failure to submit above information, if submitting a Joint Venture bid, will mean disqualification of the bid.

TD 6.2 **TAX CLEARANCE CERTIFICATE REQUIREMENTS**

It is a condition of bid that the taxes of the successful bidder **MUST** be in order, or that satisfactory arrangements have been made with the South African Revenue Service (SARS) to meet the bidder's tax obligations.

In order to meet this requirement, bidders must ensure that they are registered on the CSD and their tax status on the CSD are indicated as compliant.

In bids where Consortia / Joint Ventures / Sub-Contractors are involved, each party must submit a separate CSD registration and tax status.

If a discrepancy exist between the CSD and the SARS eFiling of the supplier, then a printed version of the Tax Clearance Certificate must be supplied by the supplier

and the eFiling PIN number for verification of authenticity by **Casidra** on the SARS website.

Foreign suppliers with no tax obligation in South Africa must request from **Casidra** and complete a form SBD1 that will be submitted to SARS for verification and issuing of a Confirmation of Tax Obligation letter.

TD 6.3 **EVALUATION OF THE BID**

The awarding of bids is dependent on the special evaluation criteria as set out in the policies of **Casidra**. The evaluation criteria of this Preferential Procurement Policy is based on the "**Preferential Procurement Policy Framework (Act 5 of 2000)**" and related Regulations and updates.

Awarding of the bid is dependent on a preferential points system, and every presentation is measured against the specific evaluation criteria as indicated.

Final points awarded to bid = (B) Price Max 80% + (C) B-BBEE Max 20%

In accordance with **Casidra's** Preferential Procurement Policy, this bid as further indicated under TD 6.7 is subject to:

- **B-BBEE certified bids will receive preferential scores.**

Please note that the bids will also be evaluated based on the viability of the price. All suitable prices will fall within 20% of the median of the compliant bids. In other words, if any compliant bid falls outside of this interval, it will be regarded as non-complaint on the basis of having a non-viable price.

TD 6.4 **DETAILED COMPANY PROFILE**

It is compulsory for this bid for the contractor to attach a **DETAILED & COMPREHENSIVE** company profile including core competencies of personnel. The company profile must summarize information about your organisation.

In order for a company profile to be compliant for this bid, the following detail **MUST** be included in the company profile:

1. Company core business activities – Describe your products and services and markets in which you operate.

2. Company background – State number of years in business, location, history of company, etc.

3. Company resources – Number of employees, core competencies of personnel, structure of company – organogram.

TD 6.5 **SECTION A: FUNCTIONALITY REQUIREMENTS**

Functional refers to: A service or product that is designed to be practical, useful, working or operating, taking into account factors like quality, reliability, viability, and durability and the technical capacity (time and resources) and ability (knowledge and skills) of the contractor to execute the works.

An offer that does not obtain the minimum score for each functionality criterion or the minimum weighted average for functionality as indicated, is not an acceptable tender.

Is this tender subject to the evaluation of functional requirements? **NO** (**Casidra** to indicate)

If "YES", the following criteria will be used for evaluation:

TD 6.6 **Section B – Formula for Awarding of Price Points** (Only to be considered if Section A has met the minimum requirement)

Unconditional discounts offered will be taken into account for determining the following point:

$$Point = 80\left[1 - \frac{Price - P\ min}{P\ min}\right]\ where\ P\ min\ is\ the\ lowest\ acceptable\ bid$$

TD 6.7 **SECTION C – B-BBEE CONTRIBUTION**

An ***EME*** must submit a valid, fully completed, **original, certified, dated and signed sworn affidavit** (no photostat copies of certification allowed) confirming annual turnover and level of black ownership or an affidavit issued by Companies Intellectual Property Commission (accounting officer for a Closed Corporation).

If a **start-up EME,** a **clear**, **originally certified copy**, of B-BBEE certificate issued by the CIPC for EME-s only is accepted.

A ***QSE that is less than 51% (50% or less) black owned*** must be verified in terms of the QSE scorecard issued via Government Gazette and submit a **clear, valid, originally certified copy** of a B-BBEE Verification Certificate issued by SANAS.

A ***QSE that is at least 51% black owned (51% or higher)*** must submit an **original, certified, dated and signed sworn affidavit** confirming turnover and level of black ownership as well as declare its empowering status or an affidavit issued by Companies Intellectual Property Commission.

A ***large enterprise*** must submit a **clear, valid, originally certified copy** of a B-BBEE Verification Certificate issued by a verification agency accredited by SANAS.
A **trust, consortium or joint venture**, will qualify for points for their B-BBEE status level as a legal entity, provided that the entity submits their B-BBEE status level certificate.

A **trust, consortium or joint venture** (including unincorporated consortia and joint ventures) must submit a consolidated B-BBEE status level verification certificate for every separate tender.

Tertiary institutions and public entities will be required to submit their B-BBEE status level certificates in terms of the specialized scorecard contained in the B-BBEE Codes of Good Practice.

Bids of non-compliant contributors (no certificate) will be considered, but no points will be awarded for B-BBEE status.

The generic threshold for EME are R10 million, but depending on the sector, the threshold as set in the BEE charter for that sector will apply. (Tourism R2.5mill and Construction R1.5 mill)

B-BBEE Status level of contributor	Number of points		Points awarded	BEE recognition level
1	20		EME & QSE 100% Black owned For office use	135%
2	18		EME & QSE 51% + Black owned For office use	125%
3	14		For office use	110%
4 and EME	12		EME 51% < Black owned For office use	100%
5	8		For office use	80%
6	6		For office use	60%
7	4		For office use	50%
8	2		For office use	10%
Non-compliant contributor	0		For office use	0%

Sub-contracting

Excluding any subcontracting requirements as a condition of tender, as indicated in CBD 1, the following general condition apply:

A Maximum of 25% of the value of the contract may be subcontracted without proof of the subcontractor B-BEE status:

- unless with proof of a subcontractor with equal or better B-BBEE points
- unless the subcontractor is an exempted micro enterprise with the capacity and ability to execute the subcontract.

In event of the above, full disclosure by the contractor must be made in the bid documents to **Casidra** with full details on the subcontractor as well as proof of

the capacity and ability of the subcontractor to execute the work. Subcontracting a portion of the tender, without disclosure and approval by **Casidra**, the Contractor can be penalised up to 10% of the value of the contract.

CIDB grading (for "construction" projects with a value of more than R500 000 only)
"construction": in terms of this requirement of the CIDB Act means; the provision of a combination of goods and services arranged for the development, extension, installation, repair, maintenance, renewal, removal, renovation, alteration, dismantling, or demolition of a fixed asset including building and Employer's Agenting services.

Only those bidders who are registered with the CIDB, or are capable of being so prior to the evaluation of submissions, in a contractor grading designation equal to or higher than a contractor grading designation determined in accordance with Table 5 of the Construction Industry Development Regulations, for a **6 CE** class of construction work, are eligible to have their tenders evaluated. Within the framework of a targeted development programme and compulsory subcontracting objectives, **Casidra** may accept tender offers from a contractor who is registered as a potentially emerging enterprise that is one designation lower than the advertised class of construction work.

Joint ventures are eligible to submit tenders provided that:

1. Every member of the joint venture is registered with the CIDB;
2. The lead partner has a contractor grading designation in the (above indicated) class of construction work;
3. The combined contractor grading designation calculated in accordance with the Construction Industry Development Regulations is equal to or higher than a contractor grading designation determined in accordance with Table 9 of the Construction Industry Development Regulations.

Will any portion of the contract be sub-contracted? YES / NO (delete which is not applicable)

If YES, indicate:

(i) what percentage of the contract will be subcontracted?

……

(ii) The name of the sub-contractor?

……

(iii) The B-BBEE status level of the sub-contractor?

……

(iv) Whether the sub-contractor is an EME? YES / NO (Attach B-BBEE certificate / an original sworn affidavit as proof)

TD 6.8 **LETTER OF GOOD STANDING**

The aim of the COID Act is to provide for compensation in the case of disablement caused by occupational injuries and diseases, sustained or contracted by employees in the course of their employment, or death resulting from such injuries and diseases; and to provide for matters connected therewith.

Workers who are injured on duty or obtain an occupational disease can claim compensation for temporary or permanent disablement. If workers die as a result of an injury on duty, their dependants will also be entitled to claim compensation. Employers that registered their employees are protected against civil claims in this regard. The COIDA basically prevents employees covered by the act from suing their employers for damages in terms of common law.

Please note that the following employers are exempted and do not have to pay assessment fees:

- National and provincial state departments;
- Certain local authorities
- Employers insured by a company other than the Compensation Fund like Mutual Associations. There are currently two approved mutual associations:
    - Federated Employers Mutual Assurance (FEMA), for the building industry; and
    - Rand Mutual Assurance Company (RMA), for the mining industry.

According to prescription, anyone who employs one or more part- or full-time workers **must register** with the Compensation Fund and pay annual assessment fees. The Compensation Fund is a trust fund that is controlled by the Compensation Commissioner and employer contributes to the Compensation

Fund. The Commissioner is appointed to administer the Fund and approve claims lodge by employees or their dependants. This means that the Fund will compensate the employee or their dependants and not the employer.

Where a service provider does not have any personnel in employment at time of tender, a letter from the Department of Labour must still be submitted indicating this status. A period of 14 days will be allowed after tender award for registration.

The copy of the document must be appended to **Annexure I**.

TD 6.9 **CONSTRUCTION MANAGER COMPETENCY**

Every principal contractor must appoint one full time-competent person as the construction manager in terms of Construction regulations 2014 Clause 8.

OHSA Construction regulations: Clause 8 (1) Management and supervision of construction work

A principal contractor must in writing appoint one full-time competent person as the **construction manager** with the duty of managing all the construction work on a single site, including the duty of ensuring occupational health and safety compliance, and in the absence of the construction manager an alternate must be appointed by the principal contractor.

"competent person" means a person who—
a) has in respect of the work or task to be performed the required knowledge, training and experience and, where applicable, qualifications, specific to that work or task: Provided that where appropriate qualifications and training are registered in terms of the provisions of the National Qualification Framework Act, 2000 (Act No.67 of 2000), those qualifications and that training must be regarded as the required qualifications and training;(Training and registration only applicable from August 2015) and
b) is familiar with the Act and with the applicable regulations made under the Act;

"construction manager" means a competent person responsible for the management of the physical construction processes and the coordination, administration and management of resources on a construction site;

(The level of competency needed with reference to specific person CV is a tertiary education qualification in civil Employer's Agenting and exposure not only to civil Employer's Agenting construction projects, but also all aspects of health and safety regarding construction works)

The copy of the document must be appended to **Annexure J.**

TD 7 WITHDRAWAL OF TENDER AND MISCONDUCT

Should a Contractor withdraw his tender during the period of its validity or fail to furnish the required bond of suretyship offered then he shall be liable for and pay to the Employer all expenses incurred in calling for fresh tenders, as well as the difference between his tender and any less favourable tender accepted.

Cancellation of bid will be placed in the same media as initially advertised.

Bids containing false information will be cancelled immediately without payment and/or claims for damages incurred by such cancellation.

The Contractor will be liable for the recovery of all costs and damages suffered as a result of the misconduct or cancellation of the bid or less favorable conditions affecting the award of the bid.

Exclusion of the Contractor and its directors, who acted fraudulently, from any business with an organ of state for a period not exceeding 10 years after the *alteram partem* rule has been applied.

TD 8 ADDITIONAL INFORMATION

Only information given in writing to the Contractor by the Employer's Agent during the tender period will be regarded as binding on the Contract. Verbal information, given during the site inspection or at any other time prior to the award of the Contract, will not be regarded as binding on the Contract.

TD 9 FINANCIAL INVESTIGATION

Contractors must be prepared to furnish certain documentation at own cost within 7 (seven) days of being called upon to do so.

According to the evaluation of the bid it can be insisted that an interview be conducted with the Contractor to test his knowledge on the subject or to give further information on its product, service or pricing.

The Employer retains the right to conduct a "credit reference check" as part of the appointment conditions.

TD 10 DEFINITIONS

In this Agreement, unless the context clearly indicates a contrary intention, the following words will have the following meanings and cognate expressions will have corresponding meanings:

The "Contractor" means the company or person appointed under this bid for the purposes of delivering the service for this Project to the Client as described in the Scope of Works.

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For the purposes of this document, the terms “Contractor” and “Service Provider” are assumed to have the same meaning.

“Project Manager” means an official appointed and in charge of coordinating the project at **Casidra** SOC Ltd. in accordance with the provisions of these terms and conditions.

“Service level” means the stipulated criteria applicable to the indicated project, including any set of criteria relating to the performance of the Contractor.

“Project Team” or “Steering Committee” means the people appointed by the Client and identified to guide the project and approve achievements.

“Client” or “the Client” means **Casidra** SOC Ltd.
“Employee” means a person employed by the Provincial Government or a provincial public entity, whether permanently or temporarily.

“Family member” means a spouse (partner in marriage, customary union according to indigenous law or a relationship in which the parties live together in a manner resembling a marital partnership), child, parent, brother or sister, whether such relationship results from birth, marriage or adoption.
“Construction Work” means any work as defined in the Construction regulations 2014 under the definitions

- Construction work including working at heights
- Excavation work
- Structure including demolition
- Temporary works

Unless the context clearly indicates a contrary intention, any word denoting any gender includes the other gender, the singular includes the plural and vice versa, natural person includes artificial persons and vice versa and insolvency includes provision or final sequestration, liquidation or judicial management.

TD 11 CENTRAL SUPPLIER DATABASE

National Treasury indicated during 2015 the development and future use of the Central Supplier Database (CSD) as a way of simplifying the process of doing business with government.

The CSD will be the source of all supplier information for all organs of state and will reduce the exchange of compliance documents in paper form, eliminate multiple registrations with different organs of state and ultimately reduce the cost for both business and government by enabling electronic registration and verification process.

The CSD will interface with SARS to verify tax clearance certificates and the Companies and Intellectual Property Commission (CIPC) for business registration and business ownership information. The CSD will furthermore verify supplier information with the register for tender defaulters and database of restricted suppliers. (Please see Fact Sheet and CSD pamphlets.)

From 1 September 2015 prospective suppliers should self-register on the CSD website www.csd.gov.za. Apart from registering and capturing supplier information on the CSD, suppliers currently on any database of organs of state need to maintain their records through the existing supplier systems for the period 1 September 2015 to 31 March 2016. This period will be referred to as the Interim Period. During the Interim Period suppliers that register on the CSD must provide their CSD supplier number and unique security code that will be communicated to them as well as any other relevant documentation (not yet electronically verified by the CSD) to the organs of state they want to do business with. **Casidra** urges all their suppliers to please comply with the request.

For more information, please contact National Treasury ocpo.treasury.gov.za (http://ocpo.treasury.gov.za/Suppliers_Area/Pages/Central-Supplier-Database.aspx) or Central Supplier Database for Government (https://secure.csd.gov.za/).

TD 12 DECLARATION OF INTEREST

In view of possible allegations of favouritism, it is required that the bidder declare his/her position in relation to the Client.

Is any family member, trustee, director, shareholder or member of the bidder in any way connected to the State?

and/or

Does the bidder have any relationship with a person that may be involved with the evaluation or adjudication of this bid? In view of possible allegations of favouritism, it is required that the bidder declare his/her position in relation to the Client.

If so, furnish particulars:

……
……
……
……
……

The bid may be disregarded if that bidder or its directors have abused the Client's supply chain management system, committed fraud or any other improper conduct in relation to such system.

(i) Is the bidder or any of its directors;

- listed on the National Treasury's Database of Restricted Suppliers as companies or persons prohibited from doing business with the public sector? (www.treasury.gov.za, follow the link at the bottom of the home page);
- Listed on the register for Tender Defaulters in terms of section 29 of the Prevention and Combating of Corrupt Activities Act;

(ii) Was the bidder or any of its directors;

- convicted by a court of law (including a court outside of the RSA) for fraud or corruption during the past five years?
- contract with any organ of state terminated during the past five years on account of failure to perform on or comply with the contract?

If so, furnish particulars:

……
……
……
……
……

TD 13 **ADDITIONAL CONDITIONS**

TD 13.1 **THE EMPLOYER RESERVES THE RIGHT TO:**

•Change the point system of the policy without prior notification;

•Negotiate prices after awarding of the bid;

•Disclose the results of the points awarded;

•Evaluate and award points according to the documentation supplied and evaluate functionality at its own discretion;

•Award the bid to the qualifying contractor with the highest number of points scored, unless on the basis of fairness, safety, public interest and international suppliers;

•Excluding the above, in case of the highest score not being acceptable, for procedural fairness and transparency, the Contractor will be requested to make a presentation (at least in writing) on their offer to provide further detail.

•To award the bid to a company which does not necessarily have the lowest price.

TD 13.2 **OTHER NOTES AND CONDITIONS**

•Final points scored will be rounded off to the nearest 2 decimal places

•In the event of equal scores where functionality is part of the bid, the contractor with the highest functionality score will be successful. Where there are no functionality requirements, the offer with the highest B-BBEE score will be successful. If the scores are still equal, the drawing of lots will determine the outcome.

The bid may be cancelled if:

•circumstances change and there is no longer a requirement for this service;

•funds are no longer available or if there are insufficient funds available in the budget for the work;

•no acceptable bids are received;

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•all the bid offers received are higher than R50 million;

•there is a material irregularity in the tender process;

•false information was supplied by the bidder.

TD 13.3 **EXPENSES IN PREPARATION OF THE BID**

The Client will not be responsible for, nor pay any expenses for losses which the contractor may incur in preparation of this bid.

TD 13.4 **ATTENDANCE REGISTER**

The successful contractor will be required to keep an attendance register, which meets certain criteria, of all employees who work at the project and submit this information on a bi-weekly basis to the Client who, in return, will submit a report to the funder / donor.

TD 13.5 **SITE INSTRUCTION BOOK**

The successful contractor will be required to keep a site instruction book with numbered pages on site where all the events and instructions for the works are documented. This book must be completed in triplicate where one copy is given to the Contractor, one copy is given to the Client and the other stays in the book on site.

TD 13.6 **DETAILED COMPANY PROFILE**

Tenderers are to submit a detailed company profile including the core competencies of personnel and health and safety competency of the construction manager.

The copy of the document must be appended to **Annexure L.**

TD 14 **MARKET RELATED PRICING**

If the bidder, whose tender has been compliant, and that received the highest overall points, do not offer a market related price, the offer may be negotiated with that bidder to be market related.

Are you willing to negotiate your offer? YES / NO (delete which is not applicable)

If a market related price cannot be negotiated, the offer for negotiation will be extended to the second highest point scoring bidder, then the third highest scoring bidder, where after, failing to reach any agreement, the tender will be cancelled.

TD 15 **SUPPLY CHAIN PERFORMANCE MEASUREMENT**

In order for **Casidra** to measure its supply chain efficiency and effectiveness, please assist us by answering the following questions:

What was the source that made you became aware of this bid being available? (**Mark with X**)

Personal Email invite to bid:	
Via a friend or business partner:	
National Government E-Tender website:	
Local Newspapers:	
Casidra own website:	
CIDB website	

Other: Specify…….

- Was the time allowed to date of closure sufficient for you to compile an offer?

No – too short	Yes - Sufficient	No - Too long

SECTION 2: TENDER ANNEXURES

PAGE NO.

COMPULSORY DOCUMENTATION TO BE RETURNED WITH BID

ANNEXURE A

AUTHORITY TO SIGN DOCUMENTS

I/We*, the undersigned, am/are* duly authorised to sign the form of tender on behalf of .....
..... by virtue of the
Articles of Association/Resolution of the Board of Directors*, of which a certified copy is attached, or
.....

SIGNATURE : .....

(Name in Print) :..... .....

DATE : .....

WITNESSES:

1. .....

2. .....

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To be signed upon appointment of winning contractor to form the agreement between the parties			
Signature for **Casidra**		Signature for Contractor	

*** Delete whichever is inapplicable or complete as indicated if none is applicable.**

AND

DECLARATION BY THE COMPANY SUBMITTING THE BID:

I, _____

A. As the authorised representative of the company / CC / business hereby declare that, to the best of my knowledge the abovementioned information is true and correct and that I am duly authorized as a signatory of this tender. On behalf of my business, I accept the terms and conditions as set out in this document. I will supply documentary proof of any information supplied herein on request and to the satisfaction of **Casidra**.

B. If the Contractor does not have the knowledge and skills to exercise sufficient control in terms of the Occupational Health and Safety Act requirements, the Client will appoint an Occupational Health and Safety Officer on behalf and at the cost of the Contractor.
C. If at any stage the control measures are found to be inadequate, Clause 13.1 has been exercised and the Contractor are still in breach of contract, the Client will appoint an Occupational Health and Safety Officer on behalf and at the cost of the Contractor.
D. The contractor hereby confirms that he had sufficiently made provision for Occupational Health and Safety requirements in his bid.
E. The contractor hereby confirms that he has sufficient resources to carry out the work safely as required by the Occupational Health and Safety Act.
F. The contractor hereby confirms that he has the necessary personnel that is qualified and has suitable experience, competencies, skills and training to do the work safely and meet the requirements of the Occupational Health and Safety Act and regulations.
G. For Construction works – The contractor hereby confirms that all personnel have a medical certificate of fitness specific to construction and to operate construction vehicles and mobile plant.

_____ _____

Signature Date

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Signature for **Casidra**		Signature for Contractor	

ANNEXURE B

CERTIFICATE OF VISIT TO THE SITE BY THE CONTRACTOR

This is to certify that I, ...

Representative of .....(Contractor)

visited the site on .....

accompanied by ..... (Representative of the Employer's Agent).

Having previously studied the tender/contract documents, I thoroughly examined the site. I have made myself familiar with all local conditions likely to influence the work and the cost thereof.

I further **CERTIFY** that I am satisfied with the description of the work and the explanations given by the above-named Employer's Agent, or his representative, and that I perfectly understand the work to be done in the execution of this Contract.

CONTRACTOR
For office use only

This is to verify, by the Representative of the Employer's Agent, that the above contractor did attend the compulsory site meeting.

.....
EMPLOYER'S AGENT Name

.....
EMPLOYER'S AGENT Signature

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Signature for **Casidra**		Signature for Contractor	

ANNEXURE C

ALTERATIONS BY CONTRACTOR

If the contractor wishes to make any changes to any of the bid conditions, general conditions of contract, schedule of quantities, drawings, specifications, or if he wishes to qualify his bid in any way, he must clearly set out his proposals hereunder or alternatively state them in a covering letter attached to this bid and referred to hereunder. If he makes **ANY** changes and do not list them below, his bid will be disqualified.

If no changes or amendments are made, please indicate it by writing **NONE** in the space below and signed by the Contractor.

NB. Any changes made by the contractor outside the scope of works, may influence the functionality of the end product and may result in the bid being disqualified.

Item	Suggested Change

If more space is required, please add a separate page.

.....

SIGNED ON BEHALF OF CONTRACTOR DATE

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Signature for **Casidra**		Signature for Contractor	

ANNEXURE D

SCHEDULE OF PLANT TO BE EMPLOYED ON THIS CONTRACT

The Contractor's attention is directed to the several sections of the specification. The Contractor shall enumerate hereunder:

a) Which plant will be available immediately;

b) Which plant will be available from outstanding orders for plant and

c) Which additional plant will be acquired if the contract is awarded to the Contractor.

A. PLANT IMMEDIATELY AVAILABLE FOR WORKS:

....

....

....

....

B. PLANT ON ORDER, AVAILABLE FOR THE WORKS AFTER DELIVERY:
(Information of agreements and delivery dates must be provided)

....

....

....

C. PLANT TO BE ACQUIRED IF TENDER IS SUCCESSFUL:
(Information of delivery arrangements must be provided)

....

....

....

If more space is required, please add a separate page.

....
SIGNED ON BEHALF OF CONTRACTOR DATE

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Signature for **Casidra**		Signature for Contractor	

ANNEXURE E

SCHEDULE OF STAFF

The contractor must insert in the spaces below, details of staff he intends employing on the contract.

Specify the name, qualifications and experience of the Site Agent.

_____

_____

Specify the name, qualifications and experience of the Contracts Manager.

_____

_____

SIGNED ON BEHALF OF CONTRACTOR **DATE**

If more space is required, please add a separate page.

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Signature for **Casidra**		Signature for Contractor	

ANNEXURE F

SCHEDULE OF PROPOSED SUBCONTRACTORS

Contractors shall set out in the schedule hereunder the details of any subcontractors other than plant hire firms, they propose to use on the works.

NAME OF PROPOSED SUBCONTRACTOR	ADDRESS OF REGISTERED OFFICE	NATURE OF WORK TO BE UNDERTAKEN	APPROXIMATE VALUE OF WORK

If more space is required, please add a separate page.

....

SIGNED ON BEHALF OF CONTRACTOR DATE

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To be signed upon appointment of winning contractor to form the agreement between the parties			
Signature for **Casidra**		Signature for Contractor	

ANNEXURE G

PROOF OF CIDB REGISTRATION

The contractor must attach to this page proof of CIDB registration of **6 CE** or higher or proof of application for registration.

SIGNED ON BEHALF OF CONTRACTOR .....

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Signature for **Casidra**		Signature for Contractor	

ANNEXURE H

SCHEDULE: PROOF OF RELEVANT EXPERIENCE

The following is a summary of works that have been completed successfully by bidder. In order to be compliant for this bid, the following detail **MUST** be included:

- Supply at least three different references with contact numbers.
- The description of work must be relevant to the nature of this contract. For e.g., do not list fencing projects completed when the scope of works is groyne construction.
- Elaborate on project description. For e.g., do not state “Rehabilitation” – Be specific as to the works executed in the contract to support relevant experience.

Employer (include contact information)	Description	Value of Work	Completion date

PLEASE MAKE REFERENCE TO COMPLETED GABION & CONCRETE WORKS

If more space is required, please add a separate page.

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Signature for **Casidra**		Signature for Contractor	

ANNEXURE I

SCHEDULE: REFERENCES –

Provide a minimum of least three (3) different reference letters from three (3) different companies

If more space is required, please add a separate page.

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Signature for **Casidra**		Signature for Contractor	

ANNEXURE J

LETTER OF GOOD STANDING - COIDA

The contractor must attach to this page a copy of the current letter of good standing.

If more space is required, please add a separate page.

SIGNED ON BEHALF OF CONTRACTOR .....

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Signature for **Casidra**		Signature for Contractor	

ANNEXURE K

METHOD STATEMENT FOR THE CONSTRUCTION OF TEMPORARY WATER MANAGEMENT STRUCTURES & OVERALL METHOD STATEMENT FOR CONSTRUCTION & MANAGEMENT OF WORKS AS A WHOLE.

The contractor must attach to this page their method statement of how they are going to approach the diversion of the river when building structures, as well as the method statement of how they are going to manage this construction project, including how they will manage the various processes. This method statement must address project plan for the overall works and be site specific. The award of this tender will mean monitoring works to this method statement as being the approved method of construction for the project.

BIDDERS MUST HAVE ADRESSED ALL THE BELOW POINTS IN THEIR METHOD STATEMENT. FAILURE TO INCLUDE ALL ITEMS WILL DISQUALIFY TENDER.

PROJECT PLAN – METHOD OF PROPOSED CONSTRUCTION
WATER MANAGEMENT – DEALING WITH FLOODING AND WORKING IN LIVE WATERCOURSE
DETAILED PROJECT PROGRAM

If more space is required, please add a separate page.

SIGNED ON BEHALF OF CONTRACTOR .....

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Signature for **Casidra**		Signature for Contractor	

ANNEXURE L

DETAILED COMPANY PROFILE

The contractor must attach to this page a **DETAILED & COMPREHENSIVE** company profile including core competencies of personnel. The company profile must summarize information about your organisation.

In order for a company profile to be compliant for this bid, the following detail **MUST** be included in the company profile.

- Company core business activities – Describe your products and services and markets in which you operate
- Company background – State number of years in business, location, history of company, etc
- Company resources – Number of employees, core competencies of personnel, structure of company - organogram

If more space is required, please add a separate page.

SIGNED ON BEHALF OF CONTRACTOR .....

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Signature for **Casidra**		Signature for Contractor	

ANNEXURE M

EXPERIENCE / SPECIAL KNOWLEDGE OF WORKING IN LARGE-SCALE SUBMERGED CONDITIONS.

Please provide proof of your company's experience regarding working in submerged conditions. Examples and how to negotiate working in these conditions must be provided. As stated previously in the document a knowledge of working in flowing river conditions will be an advantage.

Photographic proof relevant to projects listed under experience will be advantageous.

If more space is required, please add a separate page.

SIGNED ON BEHALF OF CONTRACTOR .....

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To be signed upon appointment of winning contractor to form the agreement between the parties			
Signature for **Casidra**		Signature for Contractor	

ANNEXURE N

JOINT VENTURE AGREEMENT / CONTRACT.

If applicable please provide proof of signed JV contract and detailed agreement between parties.

If more space is required, please add a separate page.

SIGNED ON BEHALF OF CONTRACTOR .....

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Signature for **Casidra**		Signature for Contractor	

SECTION 3: CONTRACT DATA

PART 1: DATA PROVIDED BY THE EMPLOYER

GENERAL CONDITIONS OF CONTRACT

The General Conditions of Contract for Construction Works 3rd Edition (2015), published by the South African Institution of Civil Engineering (SAICE) shall apply to and form the General Conditions of Contract for this contract. Copies of these conditions of contract are obtainable from:

The South African Institution of Civil Engineering (SAICE)
Private Bag X200
Halfway House 1685
Tel: (011) 805 5947
Fax: (011) 805 5971
E-mail: civilinfo@saice.org.za.

The General Conditions of Contract 2015 make several references to the Contract Specific Data, which together with these conditions collectively describe the risks, liabilities and obligations of the contracting parties and the procedures for the administration of the Contract. The Contract Specific Data shall have precedence in the interpretation of any ambiguity or inconsistency between it and the general conditions of contract.

The General Conditions of Contract shall be read in conjunction with the variations, amendments and additions set out in the Contract Specific Data that follows. Each item of Contract Specific Data is cross-referenced to the clause in the General Conditions of Contract to which it mainly applies.

CONTRACT SPECIFIC DATA

The following contract specific data are applicable to this Contract:

Clause 1.1.1.13

The defects liability period is **12 months.**

Clause 1.1.1.14

The time for achieving Practical Completion is **6 months**.

Clause 1.1.1.15:

The Employer is **CASIDRA SOC LIMITED**

Clause 1.1.1.16:

The **Employer's Agent**, referred to in the documents, is **CASIDRA SOC LIMITED.** Representation of the Employer's Agent will be in the form of a **Project Manager.**

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The person appointed by the Client to act as the Project Manager.

Clause 1.1.1.26:

The Pricing Strategy is a Re-measurement Contract.

Clause 1.1.1.28:

Replace with the following:

"**Scope of Work**" means the document(s) containing the Standard Specifications, the Project/Particular Specifications and the Drawings, that specifies and describes the Works, which are to be provided, and any other requirements and constraints relating to the manner in which the work is to be performed.

Add the following Clauses after Clause 1.1.1.34:

1.1.1.35 "**Drawings**" means all drawings, calculations and technical information forming part of the Tender Documents (other than information contained in the Specifications) and any modifications thereof or additions thereto from time to time approved in writing by the Employer's Agent or delivered to the Contractor by the Employer's Agent.

Clause 1.2.1.2:

The address of the Employer is: **22 Louws Avenue**

Southern Paarl

Western Cape

7646

The address of the Employer's Agent is: **22 Louws Avenue**

Southern Paarl

Western Cape

7646

Clause 3.2:

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Add the following after 3.2.4:

3.2.5 The Employer's Agent shall establish the basic reference pegs and benchmarks on the Site and give to the Contractor the particulars thereof in sufficient time to enable the Contractor to meet his approved program.

Clause 4.2:

Add the following after 4.2.2

4.2.3.1 After compliance by the Employer's Agent with the provisions of Clause 3.2.5, 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 and for the provision of all necessary instruments, appliances and labour in connection therewith.

4.2.3.2 If at any time during the progress of the Works, any error shall appear or arise in the position, levels dimensions or alignment of any part of the Works, the Contractor, on being required to do so by the Employer's Agent, shall at his own expense rectify such error to the satisfaction of the Employer's Agent, but if such error is based on incorrect data supplied in writing by the Employer's Agent or if there is any delay in providing the particulars required in terms of Sub-Clause 11.3.1, the Contractor shall, in respect of that delay and the Cost of such rectification, be entitled to make a claim in accordance with Clause 48.

"The Contractor shall carefully protect and preserve all benchmarks, sight-rails, pegs and other things used in setting out the Works. The checking of any setting-out or of any line or level by the Employer's Agent shall not relieve the Contractor of his responsibility for the correctness thereof."

Clause 4.3:

Add the following Clauses after Clause 4.3.2:

4.3.3 The Employer and the Contractor shall enter into an agreement to complete the work required for the construction of the works in terms of the provisions of Section 37(2) of the Occupational Health and Safety Act (No. 85 of 1993) and the Construction Regulations promulgated thereunder. A Health and Safety Agent has been appointed for this project. Contact details will be supplied to the Contractor. The contractor to make provision in his price for the management of all Health and Safety management of works. A health & safety specification and baseline risk assessment will be provided at the compulsory site meeting.

4.3.4 The works was subject to environmental authorization and a ROD from DEA&DP was issued as well as a Water User License agreement. An Environmental Control Officer has been appointed to supervise construction for compliance. Contact details will be supplied to the contractor. An environmental management plan will be issued at the compulsory site meeting.

4.3.5 All relevant Road Safety regulations apply as the transport of material will be on public roads. This requires *inter alia* red flag bearers at the intersections.

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Clause 5.3.1:

The Commencement Date will be the date that the site is handed over to the Contractor by the Employer's Agent/Client.

The Contractor will not be permitted to commence executing the Works before the Form of Guarantee and required insurances and other specified items have been submitted and approved. The documents required before commencement with Works execution are:

- Health and Safety Plan (Refer to Clause 4.3)
- Initial program (Refer to Clause 5.6)
- Insurances (Refer to Clause 8.6)

Clause 5.3.2:

The time to submit the documentation required before commencement with Works execution is **Fourteen (14)** days.

Clause 5.4:

Add the following clause after Clause 5.4.3:

5.4.4 The Contractor shall bear all costs and charges for special and temporary rights of way required by him in connection with access to the Site. The Contractor shall also provide at his own cost any additional facilities outside the Site required by him for the purposes of the Works.

Clause 5.5.1:

The Works shall be completed within **(6) Months** (and agreed to by the Employer), inclusive of special non-working days and inclusive of the period referred to in Clause 5.3.2.

Clause 5.6.1:

The Contractor shall deliver his programme of work within **(14)** days from the Commencement Date.

Clause 5.8.1:

The non-working days are **(Sundays)**

The special non-working days are:

(1) All gazetted public holidays falling outside the year end break and
(2) The year end break for the Civil Employer's Agenting construction sector commencing in December 2021 and ending in January 2022 as gazetted.

Clause 5.12.2.2:

No extension of time will be granted in respect of any delays attributed to normal climatic conditions. Normal Climatic Conditions shall be deemed to include normal rainfall and associated wet conditions and materials, strong winds and extremes of temperature.

Floods are to be expected working under these conditions. Abnormal flooding of the river could lead to extension of time; however, it must be declared a flood by the local municipality.

Clause 5.12.3:

If an extension of time is granted, the contractor shall be paid such additional time related General items.

Clause 5.12.4:

If feasible, the Employer's Agent may request the contractor to accelerate the rate of progress to achieve practical completion without extension of time and determine the cost for payment of such acceleration in accordance with clause 6.4.

Clause 5.13.1:

The penalty for failing to complete the Works is **R3000.00** per calendar day.

Clause 5.14.4:

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

"However, a Certificate of Completion will not be issued before the Contractor hands over a consolidated Health and Safety file that shall include all the specified information, as well as all "As Built" information as required by the Employer's Agent."

Clause 5.14.5:

Delete the contents of Clause 5.14.5.1 from this Contract and replace with the following:

Not used.

Clause 5.16.3:

The contractor's liability period for latent defects after the issuing of the Final Approved Certificate shall be for a period of one **(1)** year.

Clause 6.2:

No Guarantee is required by the Employer.

Clause 6.5.1.2.3:

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The percentage allowances to cover the relevant charges is **10 (ten)%**.

Clause 6.7.1:

Replace the contents of sub-clause 6.7.1 with the following:

"The quantities in the Bill of Quantities are nominal quantities which are included solely for the purpose of Tender evaluation. These quantities are not guaranteed, nor have they any other significance in terms of the Contract other than a means of assessing the Tender.

Only the actual quantities of work which are executed by the Contractor in fulfilment of his obligations under the Contract will be measured or approved by the Employer's Agent for payment purposes.

An alteration of the quantities included in the Bill of quantities shall not affect the validity of the Contract. The tendered rates and prices shall remain valid and applicable irrespective of any differences between the quantities in the Bill of Quantities and the quantities finally certified for payment."

Clause 6.8.2:

Add the following to Clause 6.8.2:

The Contract Price shall **not** be subject to any contract price adjustment and the rates and prices tendered in the bill of quantities shall be final and binding throughout the period of the Contract.

Clause 6.10.1:

Add the following to Clause 6.10.1.1:

PAYMENT OF ROCKFILL

Tenderers to note that payment of rockfill items will only be paid upon signed-off completed groyne baskets. If the baskets are not signed off, the payment for rockfill will under material on site and payment will only be for 80% of invoice value, to accommodate for wastage factor on rockfill.

It is important to take into account that imported rockfill will only be permitted once the Employer's Agent is satisfied all reasonable measures have been taken to first source rock from site.

Note that the delivered rockfill must also conform to specification before payment is authorised.

Clause 6.10.1:

Add the following to Clause 6.10.1.5:

The percentage advance on materials not yet built into the Permanent Works is **80 (eighty%)** based on certified invoices provided and subject to proof of insurance for said materials and adequate security for paid material.

Tenderer to note that material on site will only be paid equivalent to the maximum amount of insurance cover held by the contractor.

Clause 6.10.2:

Replace the second sentence (commencing "The valuation of such materials …….") with the following:

"The valuation of such materials shall be based on the purchase price and delivery cost reflected by the relevant invoices or receipts, exclusive of Value Added Tax and discounts to the Contractor and inclusive of any other duties payable on such material. (Value Added Tax will be added only to the net amount certified by the Employer's Agent as payable to the Contractor in respect of each Payment Certificate, as provided for in sub-clause 49.1;"

Add the following:

"Payment to the Contractor for any materials on site shall only be authorised after proof of ownership by the Contractor has been lodged with the Employer's Agent in the form of receipted invoices or other acceptable documents."

Clause 6.10.3:

The percentage retention on the amounts due to the Contractor is **10 (ten %)** with no upper limit.

Clause 7.2.1:

Add the following to this sub-clause:

"The onus rests with the Contractor to produce work which conforms in quality and accuracy of detail to all the requirements of the specifications and drawings, and the Contractor shall, at his own expense, institute a quality-control system and provide experienced personnel, together with all transport, instruments and equipment, to ensure adequate supervision and positive control of the works at all times."

Clause 8.4.1.1:

Delete and replace with the following:

"hereby indemnifies the Employer, the Employer's Agent and all consultants against any liability in respect of damage to or physical loss of the property of any person, including any employee of the Contractor, or injury to or death of any person, including any employee of the Contractor and"

Clause 8.6.1.1.2:

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The value of the materials supplied by the Employer to be included in the insurance sum is to be equal to the maximum amount intended to claimed under MOS for any single claim.

Clause 8.6.1.1.3:

The amount to cover professional fees for repairing damage and loss to be included in the insurance sum is R0.00 -Nil.

Clause 8.6.1.3:

The limit of indemnity for liability insurance is **R5 000 000.00** for any single claim – the number of claims to be unlimited during the construction and defects liability periods.

Clause 8.6.1.5:

Additional insurances:

a) Insurance of Construction Plant and Equipment (including tools, offices and other temporary structures and contents) and other things (except those intended for incorporation into the Works) brought onto the site for a sum sufficient to provide for their replacement.

(b) Insurance in terms of the provisions of the Compensation for Occupational Injuries and Diseases Act No. 130 of 1993.

(c) Motor Vehicle Liability Insurance comprising (as a minimum) "Balance of Third Party" Risks including Passenger Liability Indemnity.

(d) Where the contract involves manufacturing and/or fabrication of the works or part thereof at premises other than the Site, the Contractor shall satisfy the Employer that all materials and equipment for incorporation in the works are adequately insured during manufacture and/or fabrication. In the event of the Employer having an insurable interest in such works during manufacture or fabrication then such interest shall be noted by endorsement to the Contractor's Policies of Insurance.

Clause 8.6.6:

The contractor shall within **(14) fourteen** days from the Commencement Date (Appointment date) produce to the Employer's Agent the relevant policy or policies of insurance.

Clause 9.2.1:

Add the following Clauses after Clause 9.2.1.8:

9.2.1.3.9 The Contractor fails to provide the required Guarantee and insurances within the prescribed time.

9.2.1.3.10 The Contractor committed a corrupt or fraudulent act during the execution of the contract.

Clause 10.1:

Add the following after 10.1.5.2:

10.1.6:

"Early warning – A Party shall notify the other as soon as he is aware of any circumstance which may delay or disrupt the Works, or which may give rise to a claim for additional payment. The Contractor shall take all reasonable steps to minimize these effects.

The Contractor's entitlement to extension of the Time for Completion or additional payment shall be limited to the time and payment which would have been due if he had given prompt notice and had taken all reasonable steps."

Clause 10.4.1:

ADD the following to Clause 10.4.1:

10.4.1.1 If the dispute is not capable of being settled amicably between the parties, such dispute shall be elevated to Casidra Senior Management/ Executive or their duly authorised representatives for mediation purposes, within 7 days of such a dispute having arisen.

10.4.1.2 Should the dispute, despite referral for mediation as above, remain unresolved for a period of 30 (thirty) days after being so referred, the parties may, by mutual consent, follow an arbitration procedure as agreed between them, without detracting from either party's right to institute action or motion proceedings in the Magistrate Court or other court of competent jurisdiction in respect of any dispute that may arise out of this agreement.

Clause 10.7.1:

Dispute resolution shall be by arbitration.

ADDITIONAL CONDITIONS OF CONTRACT

The additional Conditions of Contract are:

Clause 11: Contractor to provide everything necessary

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The Contractor is to provide all labour, material, workmanship, machinery, and everything which is or may be necessary in and for the execution and entire completion of the Contract in accordance with the Conditions of Contract, Drawings and Scope of Work.

Clause 12: Details to be confidential

The Contractor shall treat the details of the Works comprised in this Contract as private and confidential (save in so far as may be necessary for the purposes hereof) and shall not publish or disclose the same or any particulars thereof in any trade or technical paper elsewhere without the prior written consent of the Employer's Agent.

Clause 13: Exclusions

Environmental legislation:
The works was subject to environmental authorization and a ROD from DEA&DP was issued. An Environmental Control Officer has been appointed by the Employer to supervise construction for compliance. Contact details will be supplied to the contractor.

Occupational Health and Safety Act:
A Health and Safety representative has been appointed for this project. Contact details will be supplied to the contractor.

Clause 14: Assignment, cession and delegation

Neither of the Parties may transfer any rights, obligations, share or interest acquired in terms of this Agreement, in whole or in part, to any other party or person without the prior written consent of the other, which consent must not be unreasonably withheld or delayed.

Clause 15: Relaxation

No indulgence, leniency or extension of a right, which either of the Parties may have in terms of this Agreement, and which either party ("grantor") may grant or show to the other party, will in any way prejudice the grantor, or preclude the grantor from exercising any of the rights that it has derived from this Agreement, or be construed as a waiver by the grantor of that right.

Clause 16: Waiver

No waiver on the part of either party to this Agreement of any rights arising from a breach of any provision of this Agreement will constitute a waiver of rights in respect of any subsequent breach of the same or any other provision.

Clause 17: Severability

In the event that any of the terms of this Agreement are found to be invalid, unlawful or unenforceable, those terms will be severable from the remaining terms, which will continue to be valid and enforceable.

Clause 18: Nature of the relationship

18.1 This Agreement does not create an employment relationship, partnership, joint venture or

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Signature for **Casidra**		Signature for Contractor	

agency between the parties and neither party shall be liable for the debts of the other party, howsoever occurred.

18.2 The employees of the Contractor will at no time be considered to be employees of the Client and nor will the Client be jointly and severally liable in the event of any contraventions by the Contractor or any of its obligations towards its employees.

18.3 The Contractor will inform all the employees appointed to fulfil the terms if this Agreement that the Client is not liable to them for any obligations in terms of any contract of employment with the Contractor, in terms of the *Labour Relations Act, 1997* (Act No. 66 of 1995) or the *Basic Conditions of Employment Act, 1997* (Act No. 75 of 1997).

PART 2: DATA PROVIDED BY THE CONTRACTOR

Clause 1.1.1.9:

The name of the Contractor is ……

Clause 1.2.1.2:

The address of the Contractor is

Physical Address : ..…….. Postal Address : ……

…… ..……..

…… ……

…… ……

…… ……

Telephone : …… Fax: ……...

E-mail : ……..…

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SECTION 4: CONTRACT FORMS

In accordance with the requirements of the conditions of contract the enclosed forms shall be used as and when necessary. The following forms are enclosed:

(i) Form of Offer and Acceptance

(ii) Deed of Suretyship

(iii) Supplier Registration Form

(iv) Bank Entity Form

Form of Offer and Acceptance

(Agreement)

Offer

The Employer, identified in the Acceptance signature block, has solicited offers to enter into a contract in respect of the following works:

.....

The Contractor, identified in the Offer signature block below, has examined the documents listed in the Tender Data and addenda thereto as listed in the Tender Schedules, and by submitting this Offer has accepted the Conditions of Tender.

By the representative of the Contractor, deemed to be duly authorised, signing this part of this Form of Offer and Acceptance, the Contractor offers to perform all of the obligations and liabilities of the Contractor under the Contract including compliance with all its terms and conditions according to their true intent and meaning for an amount to be determined in accordance with the Conditions of Contract identified in the Contract Data.

Undertaking by the company submitting the bid:

I, ...

as the authorised representative of the company / CC / business hereby declare that, to the best of my knowledge the furnished information is true and correct and that I am duly authorized as a signatory of this tender. On behalf of my business, I accept the terms and conditions as set out in this document. I will supply documentary proof of any information supplied herein on request and to the satisfaction of the Employer.

.....
.....
Signature .....Date

THE OFFERED TOTAL OF THE PRICES INCLUSIVE OF VALUE ADDED TAX IS

.....

.....Rand (in words); R..... (in figures),

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This Offer may be accepted by the Employer by signing the Acceptance part of this Form of Offer and Acceptance and returning one copy of this document to the Contractor before the end of the period of validity stated in the Tender Data, whereupon the Contractor becomes the party named as the Contractor in the Conditions of Contract identified in the Contract Data.

For the contractor: .....
Signature

.....
Name

.....
Capacity

Name and address of organisation: .....

.....

.....

.....

Signature and name of witness:

.....
Signature

.....
Name

Date .....

Acceptance

By signing this part of this Form of Offer and Acceptance, the Employer identified below accepts the Contractor's Offer. In consideration thereof, the Employer shall pay the Contractor the amount due in accordance with the Conditions of Contract identified in the Contract Data. Acceptance of the Contractor's Offer shall form an agreement between the Employer and the Contractor upon the terms and conditions contained in this Agreement and in the Contract that is the subject of this Agreement.

The terms of the contract are contained in

Part 1 Agreements and Contract Data, (which includes this agreement)

Part 2 Pricing Data

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Part 3 Scope of Works

Part 4 Site Information

and drawings and documents or parts thereof, which may be incorporated by reference into the above

Deviations from and amendments to the documents listed in the Tender Data and any addenda thereto listed in the Tender Schedules as well as any changes to the terms of the Offer agreed by the Contractor and the Employer during this process of offer and acceptance, are contained in the Schedule of Deviations attached to and forming part of this Agreement. No amendments to or deviations from said documents are valid unless contained in this Schedule, which must be duly signed by the authorised representative(s) of both parties.

The Contractor shall within **two** weeks after receiving a completed copy of this Agreement, including the Schedule of Deviations (if any), contact the Employer's agent (whose details are given in the Contract Data) to arrange the delivery of any bonds, guarantees, proof of insurance and any other documentation to be provided in terms of the Conditions of Contract identified in the Contract Data at, or just after, the date this Agreement comes into effect. Failure to fulfil any of these obligations in accordance with those terms shall constitute a repudiation of this Agreement.

Notwithstanding anything contained herein, this Agreement comes into effect on the date when the Contractor receives one fully completed original copy of this document, including the Schedule of Deviations (if any). Unless the Contractor (now Contractor) within five days of the date of such receipt notifies the Employer in writing of any reason why he cannot accept the contents of this Agreement, this Agreement shall constitute a binding contract between the parties,

For the Employer: .....
Signature

.....
Name

.....
Capacity

Name and address of organisation:

.....

.....

.....

.....

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Signature and name of witness:

.....
Signature

.....
Name

Date .....

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Signature for **Casidra**		Signature for Contractor	

Schedule of Deviations

Notes:

1. The extent of deviations from the tender documents issued by the Employer prior to the tender closing date is limited to those permitted in terms of the Conditions of Tender,

2. A Contractor's covering letter shall not be included in the final contract document. Should any matter in such, letter, which constitutes a deviation as aforesaid become the subject of agreements reached during the process of, offer and acceptance, the outcome of such agreement shall be recorded here,

3. Any other matter arising from the process of offer and acceptance either as a confirmation, clarification or change to the tender documents and which it is agreed by the Parties becomes an obligation of the contract shall also be recorded here,

4. Any change or addition to the tender documents arising from the above agreements and recorded here, shall also be incorporated into the final draft of the Contract,

1 Subject: _____

Details: _____

_____

_____

2 Subject _____

Details: _____

_____

_____

_____

_____

_____

By the duly authorised representatives signing this Schedule of Deviations, the Employer and the Contractor agree to and accept the foregoing Schedule of Deviations as the only deviations from and amendments to the documents listed in the Tender Data and addenda thereto as listed in the Tender Schedules as well as any confirmation, clarification or change to the terms of the offer agree by the Contractor and the Employer during this process of offer and acceptance.

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It is expressly agreed that no other matter whether in writing, oral communication or implied during the period between the issue of the tender documents and the receipt by the Contractor of a completed signed copy of this Agreement shall have any meaning or effect in the contract between the parties arising from this Agreement.

For the Contractor:

Signature(s) _____ _____

Name(s) _____ _____

Capacity _____ _____

_____

(Name and address of organisation)

Name & signature of witness _____ **Date** _____

For the Employer

Signature(s) _____ _____

Name(s) _____ _____

Capacity _____ _____

_____

(Name and address of organisation)

Name & signature of witness _____ **Date** _____

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DEED OF SURETYSHIP

(NOT APPLICABLE)

CONTRACT NO: 127/2013

WHEREAS, ……..

(hereinafter referred to as "the Employer") entered into on the ..... day of ....., a contract with (hereinafter called "the Contractor") for the ……

at .....

AND WHEREAS it is provided by such contract that the Contractor shall provide the Employer with security by way of suretyship for the due and faithful fulfilment of such contract by the Contractor;

AND WHEREAS ..... has/have at the request of the Contractor, agreed to give such security;

NOW THEREFORE WE, ... do hereby guarantee and bind ourselves jointly and severally as sureties and co-principal debtors to the Employer under renunciation of the benefits of division and excursion for the due and faithful performance by the Contractor of all the terms and conditions of the said contract, subject to the following conditions:

1. The Employer shall, without reference and/or notice to us, have complete liberty of action to act in any manner authorised and/or contemplated by the terms of the said contract, and/or to agree to any modifications, variations, alterations, directions or extensions of the due completion date of the works under the said contract, and that its rights under this guarantee shall in no way be prejudiced nor our liability hereunder be affected by reason of any steps which the Employer may take under such contract, or of any modification, variation, alterations of the due completion date which the Employer may make, give, concede or agree to under the said contract.

2. The Employer shall be entitled, without reference to us, to release any securities held by it, and to give time to or compound or make any other arrangement with the Contractor

3. This guarantee shall remain in full force and effect until the issue of the certificate of completion in terms of the contract, unless we are advised in writing by the Employer before the issue of the said certificate of his intention to institute claims, and the particulars thereof, in which event this guarantee shall remain in full force and effect until all such claims have been paid or liquidated.

4. Our total liability hereunder shall not exceed the sum of .....

   ..... (R .....)

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Signature for **Casidra**		Signature for Contractor	

5. We hereby choose domicilium citandi et executandi for all purposes arising hereof at .....

IN WITNESS WHEREOF this guarantee has been executed by us at .....
on this ..... day of .....20……

AS WITNESSES:

NOT APPLICABLE

1. ..... **Signature** : .....

(Name in Print) : .....

2. ..... **Duly authorised to sign on behalf of** : .....

(Name in Print) : .....

Address : .....

Casidra

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Casidra, as a Schedule 3D development and implementation agent for the Western Cape Provincial Government underwrites, and complies with the Provincial and National developmental initiatives and administers funds on behalf of donors. Within this context, and because of the specific requirements of the donors for the application of the funds, the awarding of tenders / quotations is dependent on the special evaluation criteria as set out in the policies of **Casidra**. The evaluation criteria of this Preferential Procurement Policy is based on the "**Preferential Procurement Policy Framework (Act 5 of 2000)**" and related Regulations (updated for Notice No. R502 of 8 June 2011).

Awarding of the bid is dependent on a preferential points system, and every presentation is measured against the specific evaluation criteria as shown. **The completion and signature of the document is thus a pre-requisite to qualify as a service provider.**

GENERAL DETAILS: *(Please print clearly)*	
Registered Company Name	
Trading Name / Individual Full Name	
Company Reg Number / ID Number	
VAT Number	
CSD Supplier Number *	
CSD Unique Registration Ref Number *	
Postal Address	
Postal Code	
Physical Address	
Postal Code	
CONTACT DETAILS	
Representative Name	
Telephone Number	

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Cell Phone Number			
Fax Number			
Email Address			
Website Address			
OTHER DETAILS -			
Main Business Type *(Please tick)*		Consultants & Professionals	
Tools & Equipment (Hardware)		Clothing & Textiles	
Office Supplies & Furniture		Accommodation & Transport	
Training & Mentorship		Printing & Advertising	
Event Services (Catering, Venue Hire)		Irrigation & Water Services	
Earthmoving & Heavy Machinery		Other Production Inputs	
Seed, Fertilizer, Chemicals		Livestock & Animal Production	
Construction Services		Repairs & Maintenance	
Vehicles & Implements		Municipal & Bulk Services	
Other (Please Specify)			
** Note that you HAVE to register on the Central Supplier Database (CSD) (www.csd.gov.za) before we can use you as a service provider.*			

CBD 7

BANK ENTITY FORM

1. DETAILS OF COMPANY / INDIVIDUAL: *(Please print clearly)*	
Full Name	
ID Number	
Company Reg Number	
VAT Number	
Postal Address	
Postal Code	
Physical Address	
Postal Code	
2. BANKING DETAILS	
Name of Bank	
Name of Branch	
Branch Code	
Account Number	
Type of Account	
3. CONFIRMATION BY BANK	
We hereby confirm that the bank details under paragraph 2 of this form belongs to the individual / company under paragraph 1.	
Date Stamp of Bank	**BANK OFFICIAL**
	Print Name:
	Signature:

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Signature for **Casidra**		Signature for Contractor	

SECTION 5: SCHEDULE OF QUANTITIES

PREAMBLE TO THE SCHEDULE OF QUANTITIES

1. The general conditions of contract, the special conditions of contract (if any), the specifications (including the project specification) and the drawings are to be read in conjunction with the schedule of quantities.

2. a) The schedule comprises items covering the Contractor's profit and costs of general liabilities and of the construction of temporary and permanent works.

   b) The Contractor is at liberty to insert a rate of his own choosing for each item in the schedule and his attention is drawn to the fact that the Contractor has the right, under various circumstances, to payment for additional works carried out and that the Employer's Agent is obliged to base his assessment of the rates to be paid for such additional work on the rates inserted in the schedule by die Contractor.

   c) Clause 6.1.1 of each standardised specification and the measurement and payment clause of each particular specification, read together with the relevant clauses of the project specification, set out what ancillary or associated activities are included in the rates for the operations specified.

3. Descriptions in the schedule of quantities are abbreviated and the schedule has been drawn up generally in accordance with the latest issue of CIVIL ENGINEERING QUANTITIES(1). Should any requirement of the measurement and payment clause of the applicable standardised specification(2), or the project specification(2), or the particular specification(s) (2) conflict with the terms of the schedule or, when relevant, CIVIL ENGINEERING QUANTITIES(1), the requirement of the standardised, project or particular specification, as applicable, shall prevail.

4. Unless otherwise stated, items are measured net in accordance with the drawings, and no allowance has been made for waste.

5. The prices and rates to be inserted in the schedule of quantities are to be the full inclusive prices to the Employer for the work described under the several items, **value added tax excluded**. Such prices shall cover all costs and expenses that may be required in and for the construction of the work described, and shall cover the cost of all general risks, liabilities and obligations set forth or implied in the documents on which the tender is based.

6. A price or rate is to be entered against each item in the schedule of quantities, whether the quantities are stated or not. An item against which no price is entered will be considered to be covered by the other prices or rates in the schedule.

7. The Contractor must price each item in the schedule of quantities in **BLACK INK.**

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8. **All prices and rates shall exclude value added tax (VAT).** The Contractor shall calculate value added tax and enter it at the end of the summary of the schedule of quantities.

9. The standard system of measurement of Civil Employer's Agenting Quantities of South Africa and South West Africa, published by the South African Institution of Civil Employer's Agents.

10. See definition in subclause 2.1 of Part 1 of SABS 0120: Format and Contents.

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DAYWORK LIST

1.0 GENERAL

Contractors must complete this list which shall be used for the assessment of value of the work which the Employer's Agent instructed in writing that must be done on a day work bases, all in agreement with clause 6.5.1.1 of the General Conditions of Contract 2010 2nd Edition and coupled Special Contract Specifications. All the rates are fixed and shall be binding till and with the issuing of the final certificate, except for statutory increases that will be announced from time to time.

2.0 LABOUR COSTS

Rates for labour as listed below shall include all the allowances as specified in the General Conditions of Contract 2010 2nd Edition and Special Contract Specifications. The extra allowance applicable on labour costs listed below, is as given in the tender appendix and must not be taken into account in this list.

Overtime costs attached to this contract shall be paid in the same relation as what the employees really are paid.

DESCRIPTION	UNIT	RATE
Unskilled labour	Hour	
Semi skilled labour	Hour	
Pipe layer	Hour	
Ganger	Hour	
Foreman/Section leader	Hour	
Brick layer	Hour	
Plumber	Hour	

3.0 EQUIPMENT COSTS

Full comprehensive hourly rates, which also include the cost of the operators, must be listed below. Rates must also include all the costs of consumable items, maintenance, depreciation, tools and all other coincidences that shall be necessary to operate the equipment for the purpose it is designed for. The rates must also include all the overhead costs, profits, site supervision, insurance, holidays with payment, travelling costs (or travelling allowances) and residence allowances of operators and any other allowances that is applicable. No further percentage allowances shall be applicable on equipment. The Contractor must list under each heading the fabrication and specification of the equipment available.

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DESCRIPTION	UNIT	RATE
1. **Excavators** _____ 22t:_____ 27t:_____ 32t:_____	 Hour Hour Hour	
2. **Graders** _____ _____ _____	 Hour Hour Hour	
3. **Front-end loaders** 55 kW: _____ 140 kW: _____ 500 kW_____ Other:_____	 Hour Hour Hour Hour	
4. **Rollers** 2t:_____ 12t:_____ 19t:_____ Other:_____	 Hour Hour Hour Hour	
5. **Compressor** _____ _____ _____ _____	 Hour Hour Hour Hour	
6. **Concrete mixer (litres specified)** _____ _____ _____ _____	 Hour Hour Hour Hour	
7. **Bull dozers** D6 _____ _____ D8 _____ _____	 Hour Hour Hour Hour	

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8. **Dumper trucks** _____ _____ _____ _____	Hour Hour Hour Hour	
9. **TLB** _____ _____ _____ _____	Hour Hour Hour Hour	
10. **LDV** _____ _____ _____ _____	Hour Hour Hour Hour	
11. **Other (specify)** _____ _____ _____ _____	Hour Hour Hour Hour	

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Signature for **Casidra**		Signature for Contractor	

UPPER KEURBOOMS – CONSTRUCTION OF EROSION PROTECTION STRUCTURES
SCHEDULE OF QUANTITIES

SECTION A:	PRELIMINARY AND GENERAL	R
SECTION B:	EARTHWORKS	R
SECTION C:	CONCRETE	R
SECTION D:	GABIONS AND PITCHING	R
SECTION E:	LANDSCAPING AND REHABILITATION	R
	TOTAL OF PRICED ITEMS	**R**

SUB TOTAL OF TENDER **R** _____

Allow 10% contingencies to be expended as directed by the Engineer and to be deducted In whole or in part if not required	R
NET TOTAL OF TENDER	R
Add 15% for VAT	R
GROSS TOTAL OF TENDER	R

Date: Signed on behalf of Tenderer

UPPER KEURBOOMS – CONSTRUCTION OF EROSION PROTECTION STRUCTURES
SCHEDULE OF QUANTITIES

Item	Payment schedule	Description	Unit	Quantity	Rate	Amount
	SANS 1200 A	**SECTION A: PRELIMINARIES**				
A1	8.3.1	**Fixed charge items**				
A1.1	8.3.2	Contractual requirements	Sum	1		
		Facilities for contractor				
A.1.2		Offices and storage sheds	Sum	1		
A.1.3		Ablutions & latrine facilities	Sum	1		
A.1.4		Tools & equipment	Sum	1		
A.1.5		Medical assessment of employees	Sum	1		
		Other time-related obligations (specify)	Sum	1		
A.1.7		Remove tools & equipment from site	Sum	1		
A.2		**Time related items**				
A.2.1	8.4.1	Contractual requirements (including insurances)	Month	11		
	8.4.2.2	Facilities for contractor				
A.2.2		Ablution and latrine facilities	Month	11		
A.2.3		Tools and equipment	Month	11		
A.2.4		Plant	Month	11		
A.2.5		Health & Safety requirements	Month	11		
A.2.6		Supervision	Month	11		
A.2.7		Company and head office overhead costs	Month	11		
A.2.8		Designated Environmental Officer	Month	11		
A2.9		Environmental aspects & impacts	Month	11		
A.2.10		Provision of environmental emergency measures		Provisional		
A.2.11		Contractors markup to allow for handling costs and profit in respect of item A.2.11	%	10%		
A.2.12		Other time-related obligations (specify)	Month	11		
		……				
		……				
A.10	PS A 8.4.6	Standing time cost				
A2.10.1		Plant	Sum			
A2.10.2		Labour	Sum			

UPPER KEURBOOMS – CONSTRUCTION OF EROSION PROTECTION STRUCTURES
SCHEDULE OF QUANTITIES

Item	Payment schedule	Description	Unit	Quantity	Rate	Amount
	SANS 1200D & DA	**SECTION B: EARTH WORKS**				
B1		**Site clearance**				
		Cut and down remove alien biomass completely from site from areas where shown on plan				
B1.1		Light infestation (less than 50%)	Hectares	3		
B1.2		Heavy infestation	Hectares	6		
B1.3		Clear and strip site for groynes of all vegetation and unsuitable material to spoil/ stockpile directly behind groyne structure				
B1.2.1		**Site Clearing:** Clearing and grubbing for removal of rank, vegetation, shrubs, trees, bushes, stumps, weeds, grass including roots, debris, unusable materials, removal of 150mm thick top soil using manual or mechanical method and disposal of the same by burning or any other means including dumping to approved areas within the project site.	m^2	15000		
B1.2.2		**Site Clearing:** Removal of 150mm thick top soil using manual or mechanical method and store for reuse behind groyne	m^3	2500		
B1.3.1		Cordoning off of excavation area in farmers land with orange barrier fencing	metres	800		
B2		**Excavations**				
		Excavation in all materials to correct dimensions and depths and stacking the excavated earth & disposable materialwhere ever indicated in site, excluding back filling but including filling depressions and loose pockets wherever necessary including watering, consolidating etc., complete. Rate to include disposing of excess earth within the site and spreading in layers to required levels, shoring, bailing out water, etc. complete.				
		Excavations for depth:				
B2.1		- 0,0 m to 2,0 m	m3	2000		
B2.2		- Greater than 2,0 m	m3	800		
		Excavation in clay soil				

		Excavation in all materials to correct dimensions and depths and stockpile to 6 stockpile arrears situated 500 metres apart for:				
		Groyne for depth: Clay soil				
B2.3		- 0,0 m to 2,0 m	m3	30		
B2.4		- Greater than 2,0 m	m3	30		
		Excavation in soft rock				
		Excavation in all materials to correct dimensions and depths and stockpile to 6 stockpile arrears situated 500 metres apart for:				
		Groyne for depth: soft rock				
B2.5		- 0,0 m to 2,0 m	m3	30		
B2.6		- Greater than 2,0 m	m3	30		
B3		**Surface preparations for bedding of gabions**				
B3.1	1200DK	Cavities filled with approved excavated material or rock	m2	1000		
B4		**Fill Materials**				
		Back filling from stockpiles in plinths, for backfill behind concrete to top of concrete or else where as directed including breaking clods, watering and consolidating in 150mm thick layers, compacting each layer with vibratory compactor and at inaccessible places with wooden/steel rammers to achieve 90 to 95% MOD ASHTO density at optimum moisture content, all leads and lifts, bailing/ pumping out water to keep site dry while backfilling cost shall include conveyance of all materials, labour, ,hire and fuel charges for tools and plants and other incidental charges etc.complete as per detailed specification.				
B4.1		With excavated earth available at site	m3	2800		
B4.2		With approved earth brought from outside.	m3	30		
B4.3		**Foundation preparation** Compacted granular fill in geotextile envelopes (0,5mm to 15mm – permeable but compactable)	m3	300		
B5		**Rockfill**				
		Rockfill for matresses and gabions off site:				
		Material from commercial or other sources distant from site:				

B5.1		Excavation in borrow areas, select/screen, load, haul and stockpile, for:	m3	2750		
		Material sourced on site & stockpiled:				
B5.2		Excavation in borrow areas, select/screen, load, haul and stockpile, for:	m3	2750		
B7		**Setting out of works**				
B7.1		Allow for setting out of all construc tion works per Groyne structure	Each	21		
B8		**Over – Excavated/surplus material**				
		Hauling & placing over excavated/surplus material to areas as directed on site				
B8.1		Hauling & placing over excavated material to areas on site for shaping as directed by engineer from the selected stockpile areas	m3	2000		

UPPER KEURBOOMS – CONSTRUCTION OF EROSION PROTECTION STRUCTURES
SCHEDULE OF QUANTITIES

Item	Payment schedule	Description	Unit	Quantity		
	SANS1200GA	SECTION C: CONCRETE				
C1		GROYNES: Concrete mix 30/13 mPa for:				
C1.1		Slabs on completed groyne (including preparation of surface to receive concrete, formwork and wood-floated surface)	m^3	266		
C4		Concrete test cubes				
		Allow for the testing of concrete with an accredited laboratory. Allow for 3 no. of 150 x 150mm test cubes per test.				
C4.1		Allow for 3 sets of testing per cast as per R.E. instructions	no	180		

UPPER KEURBOOMS – CONSTRUCTION OF EROSION PROTECTION STRUCTURES
SCHEDULE OF QUANTITIES

Item	Payment schedule	Description	Unit	Quantity	Rate	Amount
	SANS1200DK	SECTION D: GABIONS AND PITCHING				
D1		Gabions and Mattresses:				
		Supply, assemble and fill cages as per specification, for:				
		(4 x 1 x 1 cages)				
D1.1		Gabion cages with Galfan mesh	m3	50		
D1.2		Gabion cages – PVC Galfan mesh	m3	1800		
		(3 x 1 x 1 cages)				
D1.3		Gabion cages with Galfan mesh	m3	50		
D1.4		Gabion cages – PVC Galfan mesh	m3	300		
		(2 x 1 x 1 cages)				
D1.5		Gabion cages with Galfan mesh	m3	50		
D1.6		Gabion cages – PVC Galfan mesh	m3	328		
		(Matresses)				
D1.7		PVC Galvan by 300mm thick	m3	3108		
D2		Geotextiles:				
		Supply and install Grade A4 geotextiles, for:				
D2.1		Below foundation, mattresses and on sides of groyne	m2	4968		
D3		Access and Drainage				
D3.1		Allow for temporary channels, drainage system and berms for diverting river flow allowing for groyne construction to take place.	each	21		

UPPER KEURBOOMS – CONSTRUCTION OF EROSION PROTECTION STRUCTURES
SCHEDULE OF QUANTITIES

Item	Payment schedule	Description	Unit	Quantity	Rate	Amount
		SECTION E: LANDSCAPING AND REHABILITATION				
E1		**Shaping**				
		Trim soil slopes				
E1.1		Shaping sides of banks to horizontal 4:1 Slope or as indicated by R.E on site	m2	5000		
		Shaping of river bed channel and adjacent wetland				
E1.1.1		Dumper truck	hours	240		
E1.1.3		Excavator	hours	240		
E1.1.4		Digger Loader	hours	240		
E1.2		Protection of Groyne structures				
E1.2.1		Planting of 3000mm 120 to 140mm CCA gumpoles clearly painted on top with 300mm to indicate groyne positions	each	21		
E2		**Topsoil**				
E2.1		Spreading of topsoil: From stockpile areas of top soil, contractor to spread 50mm thick over sloped area.	m2	2500		
E2.2		Spreading of topsoil: From commercial sources: Stockpile areas of top soil, contractor to spread 50mm thick over sloped area.	m2	500		
E3		**Repariworks on access road**				
E3.1		Supply, spread in 100 mm thick later and lightly compact, G5 gravel to repair access road, as specified by engineer.		2500		
E3.2		Supply and install Rr Farm Gate Heavy 3000 x 1200 x 42 x 2 mm		6		

TENDER 11/2026

CONSTRUCTION OF EROSION PROTECTION STRUCTURES IN UPPER KEURBOOMS RIVER

SECTION 6: PROJECT SPECIFICATIONS

SCOPE

This project specification is set out in two portions. Portion 1 covers a general description of the project, the facilities available and the requirements to be met. Portion 2 covers variations and additions to standardised or particular specifications that are applicable to the contract.

The numbering method in portion 2 of this project specification deviates as follows from the method suggested in the Code of Practice SABS 0120.

Each clause with the prefix PS shall refer to the congruent clause in the appropriate section of the standardised or particular specification. Such clause shall either substitute, or supplement, or amend the clause with the same number. Where there is no such congruent clause in the standardised or particular specification, the PS clause shall be a new clause in the project specification. Any clause that is referred to in the standardised specification will also include the appropriate project specification.

STATUS

Should any requirement or provision of the Project Specification, conflict with any requirement of the standard of any standard specification or any drawing, the requirements of the variations and additions to the Standardised and non-standardised Specifications of the Project Specification shall prevail.

PORTION 1: THE WORKS

PS 1 GENERAL DESCRIPTION OF CONTRACT

The scope of works entails **the construction of 21 (twenty one) gabion structures (groynes)** in the Keurbooms River over an approximate **distance of 1260 metres**.

The description of the project contained in the scope of work is merely an outline of the contract works and shall not limit the work to be carried out by the contractor under this contract.

The extent of the works is indicated on the design drawings and some of the major items are amplified in this section. Approximate detailed quantities for each type of work to be carried out are included in the bill of quantities. However, if during the course of construction conditions are found to differ from those anticipated, the engineer reserves the right to modify the scope of the work to suit the prevailing conditions and circumstances.

Variations introduced in this manner will be measured and paid for at the rates tendered for the appropriate items listed in the bill of quantities or in the absence of such rates, as extra work.

The quoted amount will be a measured bid and must include material, labour and machinery.

PS 2 DESCRIPTION OF THE SITE AND ACCESS

The site is located in Swellendam and in the Upper Keurbooms on both sides. The site to be occupied will be clearly pointed out to the contractor at the site handover. The contractor will not be allowed to extend the operations beyond the boundaries of the site.

PS 3 NATURE OF GROUND AND SUBSOIL CONDITIONS ON SITE

The construction of groynes and weirs in an environmentally sensitive riparian zone is specialized work that requires competent human resources that are adequately skilled in working with heavy and dangerous machinery/materials in aquatic and undulating conditions. The safety of all staff is of paramount importance in the implementation of this project.

This project entails working within the Upper Keurbooms channel and it is envisaged that the riverbed consists of deep gravelly layers containing sand and silt with cobbles and boulders, interspersed with occasional layers of peat.

Excavations are required for the project with the potential of water ingress due to the permeability of the founding material and existence of a high water table. The side walls of the excavations are likely to slump and collapse due to the unstable nature of the saturated founding material.

It is envisaged that dewatering of the excavations will be required while constructing the lower layers of the gabion structures.

PS 4 DETAILS OF THE CONTRACT

PS 4.1 MAIN CONTRACT

Work included in this contract involves the following:

- Construction of a temporary channel and berm to temporarily accommodate river flows and protect the construction site.
- Clearing of the river banks of alien vegetation.
- Excavations for construction of gabion riverbank protection structures (i.e., groynes, weir).
- Construction of gabion riverbank protection structures using selected stone fill from the riverbed, including continued dewatering of excavations.
- Backfilling and compaction of excavations.
- Excavation and shaping to rehabilitate the river channel.
- Construction of the terraces between groynes using material excavated from the river channel.
- Construction of the berms between groynes using excess material excavated from the river channel.
- Construction of reinforced concrete weir and diversion works
- Excavation and shaping to rehabilitate the river channel
- Trimming and finishing off river channel and fill slopes.

PS 4.2 OTHER CONTRACTORS

N/A

PS 4.3 EMPLOYMENT OF LOCAL LABOUR

It is the intention that the local community be involved in this project and that **75%** of the unskilled labour used must come from the **(Swellendam)** area and all workers on contract must be SA Citizens.

PS 5 CONSTRUCTION PROGRAM AND METHODS

After obtaining the requirements of the Employer, a completion period is to be proposed at tender stage, for approval by the Employer. A construction programme is then to be drawn up after site handover for approval by the Employer's Agent.

Construction methods must be such a nature that no property or life is endangered. The Employer accepts no responsibility for work that is done outside the site boundaries without the Employer's Agent's approval. The Contractor himself is responsible for liaison and arrangements with the Local Authority in connection with the finalisation and approval of the construction program.

The contractor is to ensure that all staff (sub-contractors included) working on the groynes have completed a gabion installation training course presented by an independent third party, approved by the Employer's Agent. Every time a new packing team is introduced, a training course is compulsory.

The Contractor himself is responsible for liaison with the Community in respect of programming of construction through the existing settlement. No additional payment will be made in this regard and it shall deem to be covered by the relevant items.

Sufficient photos of existing structures, homes, walls and areas that have to be crossed must be taken by the Contractor and handed over to the Employer's Agent before such operations commence. No payment will be made in this regard and it shall deem to be covered in the preliminary and general items.

There are areas where groynes are very close to existing structures. A dilapidation survey will have to be done of all the structures that are potentially to be interfered by the construction works. This will be done by the Resident Engineer.

The compilation of the construction program and any amendments thereto during the course of construction shall be at the cost of the Contractor and shall not be measured elsewhere in this contract.

PS 5.1 EXISTING SERVICES

If the contractor encounters any existing services such as cables, pipes or sewers during the execution of the works, he must immediately notify the Employer's Agent, halting all work in the vicinity thereof, until instructions to proceed have been given by the Employer's Agent.

Electric wires, telephone wires, pipes, etc. will not be interfered with during the course of the contract but if it should be necessary to disconnect or cut any such wires or pipes, the Employer's Agent will be advised thereof and his instruction awaited.

PS 6 SITE FACILITIES AVAILABLE

PS 6.1 SOURCES OF WATER SUPPLY AND POWER SUPPLY

The Contractor may use water free of charge from the existing supply if available. **He will obtain permission from the local authorities / community representatives before any connection to or extension of the existing supply is made, which will be executed, removed and made good on completion of the works at the Contractor's own expense.**

The Contractor may use the existing power at an agreed rate, if available. **He will obtain permission from the local authorities / community representatives before any connection to or extension of the existing supply is made, which shall be executed, removed and made good on completion of the works at the Contractor's own expense.**

PS 6.2 LOCATION OF CAMP AND DEPOT

The Contractor will be shown the site for his camp and depot at handover.

PS 6.3 HOUSING FOR CONTRACTOR'S EMPLOYEES

No housing is available for the Contractor's employees, and the Contractor shall make his own arrangements for housing his employees or transporting them to and from the site. The Contractor is in all respects responsible for the housing and transporting of his employees, and for the arrangement thereof, and no extension of time due to any delays resulting from this, will be granted.

PS 7 SITE FACILITIES REQUIRED

Other facilities such as an office, telephone, name board, survey equipment, etc. required for the Employer's Agent, are described under the relevant sections.

PS 8 FEATURES REQUIRING SPECIAL ATTENTION

PS 8.1 SAFETY REGULATIONS

Both the "Factories, Machinery and Building Work Act (Act 22 of 1941) and the "Machinery and Occupational Safety Act (Act 6 of 1983)" must, wherever they appear in the SABS 1200 standardised specifications, be substituted by the "Occupational Health and Safety Act (Act 85 of 1993)". The Contractor should please note that the new Construction Regulations 2014 are applicable on this contract.

PS 8.2 **SURVEY BEACONS**

Survey pegs will be indicated to the Contractor. The Contractor shall be solely responsible for the protection of survey pegs. The Contractor's attention is specifically drawn to the requirements of SABS specification 1200 A: General, clause 5.1 survey, in this respect.

PS 8.3 **"AS BUILT" DRAWINGS**

As the work progresses, the Contractor shall keep full records of all amendments to and deviations from the drawings as issued to the Contractor at the start of the contract. The Contractor with his payment certificate, to the Employer's Agent, must submit this information monthly. The true positions, invert levels and ground levels of all services shall be indicated on the drawings, for which purpose the Contractor shall receive a separate complete set of drawings from the Employer's Agent, at no cost.

The completion certificate shall only be issued after the Employer's Agent has received a properly completed set of "**as-built**" drawings from the Contractor. No separate payment shall be made for this service, as all costs related thereto shall be deemed to be included in the related items.

PS 8.4 **FINISHING AND TIDYING**

Progressive and systematic finishing and tidying will form an essential part of this contract. Under no circumstances shall spoil, rubble, materials, equipment or unfinished operations be allowed to accumulate unnecessarily and in the event of this occurring the Employer's Agent shall have the right to withhold payment for as long as necessary in respect of the relevant works in the area(s) concerned.

PS 8.5 **SECURITY**

Tenderers are to be aware that this is a high risk area regarding theft and an allowance will have to be made by the contractor for security personnel regarding plant & site camp.

PS 9 **ENVIRONMENTAL REQUIREMENTS**

The contractor shall take particular note of the environmental requirements contained in the project specifications. Should the contractor fail to comply in all respects the engineer will have the authority to stop the works until he is satisfied that measures have been taken to comply with the environmental requirements.

Personnel and plant shall not enter property beyond the boundaries of the site irrespective of whether or not the boundary is fenced.

The employer will appoint an environmental consultant appointed to conduct regular audits and to report on his findings at the monthly site meeting.

PS 10 EXTENSION OF TIME RESULTING FROM ABNORMAL CLIMATIC CONDITIONS

The Contractor shall make allowance for the average rainfall and windy conditions that may exist during the contract period. All necessary steps shall be taken to proceed with the works despite inclement weather. The Contractor shall however record all rainy and windy periods which adversely affect the contract extension of time in terms of clause 5.12.2.2 of the general conditions of contract 2015 3rd Edition, arising from abnormal climatic conditions, shall be applied as follows:

Delays on working days only (based on a six-day working week) will be taken into account for the extension of time, but the Contractor shall make provision in his programme of work for an expected delay of "n" working days caused by normal inclement weather, for which he will not receive any extension of time. The value of "n" for this contract shall be based on the loss of **(37)** working days per annum due to inclement weather.

Extension of time during working days will be granted to the degree to which actual delays, as defined above, exceed the number of "n" working days as mentioned above.

When considering extension of time for abnormal climatic conditions, the effect of the loss of **(37)** working days per annum due to normal inclement weather shall be taken cumulatively over the whole contract period.

For portions of less than one year the appropriate number of days of normal inclement weather will be determined on a pro rata basis based on the following table:

MONTH	NUMBER OF NORMAL INCLEMENT WEATHER DAYS EXPECTED
January	**2**
February	**2**
March	**3**
April	**3**
May	**3**
June	**5**
July	**4**
August	**4**
September	**3**
October	**3**
November	**3**
December	**2**
Total	**37**

Should the Contractor wish to submit a claim for extension of time for the completion of the works due to the works being delayed by reason of exceptionally inclement weather he shall do so in writing and with the following details:

1. The times work was stopped and recommenced.
2. A motivation for the reasons construction could not continue, with reference to the agreed construction programme activities.
3. A report on active resources on site at the time of the disruption, which shall be certified by the Employer's Agent's site representative or Clerk-of-Works.
4. The circumstances surrounding any instruction by a third party to stop work due to inclement weather (i.e. Industrial Council/Safety Officer, etc.).

The Contractor shall submit to the Employer's Agent claims for all time lost due to inclement weather within 1 working day of the claim day, duly certified by the Employer's Agent's representative or Clerk-of-Works, as the case may be. A record of inclement weather will be kept and recorded at site meetings on a regular basis. Only when all parts of the contract have been handed over will claims, if any, be considered for exceptionally inclement weather. The onus is on the Contractor to prove these claims.

The delays granted, in terms of this clause, shall not automatically result in an overall extension of time being granted for completion of the works unless the effect is clearly applicable to the critical path of the agreed construction programme.

PS 11 GABION & MATRESS SPECIFICATIONS

Tenderers to note the following:

- All mattress sizes are 3m x 1m x 0,3m
- The gabions & mattress are heavy duty – 2,7mm thick with 80 x 100mm openings
- Binding wire is 2,2mm thick Galvan and for PVC mattresses & gabions 2,2mm thick with 0,5mm covering both sides, therefore 3,2mm thick.
- All mattresses must be PVC coated.
- Gabion must be made out of one sheet of steel.

PS 12 GABION & MATRESS SPECIFICATIONS

A sample must be built and approved during the site establishment phase and before any groyne construction can start. The sample must consist of two 4x1x1 PVC coated Galfan gabions joined together & with two 3x1x0.3 PVC coated Galfan mattress tied to it. Both the gabion and mattress must be filled with stone and the lids closed and will serve as a reference for construction on site.

Sample must also have concrete as per specification and to the approved concrete test design.

KEYCOAT SLURRY TO PROTECT EXPOSED GABION WIRES

Ingredients

- Tal Keycoat (or similar approved) - (NB definitely not “bonding liquid” which is a similar but much weaker product)
- Cement
- Clean sand (sieved river sand is acceptable)

Method

- Mix 1-part Keycoat, 1,5 parts cement and 2 parts sand (by volume)
- Apply to gabion wire with block brush
- Once dry apply second coat

Notes

- The mix should be slightly liquid
- No water may be added to the mix
- The coating should be 2-5 mm thick
- Mix small quantities so that it may be applied and tools cleaned within 20 minutes of mixing.
- It is not necessary to coat the gabion stones, although this may occur in spots.

SOURCE OF STONE GABION PACKING

SAMPLE GROYNE

Example of Groyne to be constructed prior to construction for approval of appointed Professional Engineer. Only after approval of example Groyne by Professional Engineer may the construction proceed of Groyne on the Keurbooms.

PS 13 APPLICABLE STANDARDISED SPECIFICATIONS

Although not bound in nor issued with this document, the following standardised specifications shall form part of the contract and, notwithstanding the provisions of sub clause 2.2 of SABS 1200 A, the editions specified below shall apply:

- SABS 1200 A - .....1986 GENERAL
- SABS 1200 AB - ..... 1986 ENGINEER'S OFFICE
- SABS 1200 C - .....1980 SITE CLEARANCE (as amended 1982)
- SABS 1200 D - .....1988 EARTHWORKS (as amended 1990)
- SABS 1200 DA - ..... 1988 EARTHWORKS (Small works)
- SABS 1200 DK - ..... 1996 GABIONS AND PITCHING
- SABS 1200 GA - .....1982 CONCRETE (Small works)
- SANS 5861 Concrete tests
- WCDOA gabion spec ver. 5 June 2018
- WCDOA concrete abrasion coating for gabions spec ver. 1 June 2018
- General specification for river rehabilitation works Rev. 1 April 2016

PORTION 2: VARIATIONS AND ADDITIONS

Departures from and/or additions to specifications listed in portion 1 are set out on the following pages in accordance with the numbering system of the standardized or particular specification.

PORTION 2: VARIATION AND ADDITIONS TO THE STANDARD SPECIFICATIONS LISTED IN PORTION 1

SABS 1200 A: GENERAL

A 3 **MATERIALS**

PS A 3.1 **QUALITY**

Substitute the second sentence of the first paragraph of A 3.1 with the following:

Materials shall bear the official mark of the appropriate standard.

Substitute the second paragraph with the following:

The Contractor is responsible for the cost of all testing to ascertain that the materials do comply with the specified minimum requirements of the relative materials and no additional payment will be made for such testing.

The Contractor shall inform the Employer's Agent of any control testing to be done at least 48 hours before such tests are required and must allow in his program for the time necessary for the tests and the processing of the results thereof.

A 5 **CONSTRUCTION**

A 5.1 **SURVEY**

PS A 5.1.1 **Setting Out Of the Works**

Substitute the first sentence in A 5.1.1 with the following:

Setting out of the works is the sole responsibility of the Contractor and shall be done from bench marks as indicated on the drawings. The Contractor shall, within two (2) weeks after the site has been handed over to him, ascertain himself of the correctness of all pegs and bench marks. Any discrepancy shall immediately be reported in writing to the Employer's Agent. Any costs or subsequent costs arising from discrepancies which had not been reported to the Engineer within the aforementioned period, shall be the sole responsibility of the Contractor.

A 8 **MEASUREMENT AND PAYMENT**

PS A 8.4.6 **Standing Time Costs**

a) plant ..... Unit : Sum per working day

b) labour ..... Unit : Sum per working day

c) other resources (to be specified by Contractor) ..... Unit : Sum per working day

The tendered sum for each item shall include full compensation for all standing time costs of the specified resource of whatever nature and approved by the Employer's Agent, which are not recoverable by way of the provision made in PS A 8.2.5 for the adjusted payment of time-related items.

For the purposes of calculating the total standing time cost, a working week shall be held to consist of five working days and a working day of 9 hours.

Payment for the partial standing of any of the scheduled resources for a day or part thereof, or the standing of a complete resource for a part day, will be made pro rata in proportion to an appropriate factor assessed by the Employer's Agent.

The amount by which the standing time costs is adjusted shall be subject to the contract price adjustment formula as defined in the conditions of contract.

The Contractor shall take note that this payment item shall only apply to delays, which **in the opinion of the Employer's Agent**, are incurred as a result of riot, commotion, politically motivated sabotage and acts of terrorism or disorder outside the Contractor's control. This item shall also apply to standing time incurred as a result of labour boycotts, except that only sub-items (a) and (c), as applicable, will be paid where the Contractor did not pay his labour for the time boycotted. Costs for delays incurred for all other circumstances shall be treated as provided for in the conditions of contract.

The provision of this clause shall in no way prejudice the right of either the Employer or the Contractor to determine the contract in terms of the provisions of clause 10.2 of the general conditions of contract.

The Contractor shall take note that no payment will be considered for additional cost or time lost for any daily removal of plant and equipment from the site, any additional costs incurred in protecting his plant and site establishment, or loss incurred in respect of damage to construction plant, equipment and materials supplied and the works.

In the event that GCC 46(1) becomes applicable, the time on which such penalties are calculated shall be reduced by the total standing time approved by the Employer's Agent.

PS A 8.8.5 **DAYWORKS**

Dayworks will be paid according to the percentage allowance method. For calculating the total remuneration the general conditions of contract for the construction of civil

engineering work, sixth edition (1990) shall apply, with the amendments as in the appropriate special conditions of contract which is bound into this document. A Dayworks schedule will be provided for filling in the necessary information.

A 8.8 **TEMPORARY WORKS**

PS A 8.7 **Cost of Survey in Terms of The Land Survey Act**

The sum shall cover the cost of all labour, plant and material required for the searching and compilation of a list, all in accordance with the requirements as set out in clause A 5.1.1

SABS 1200 AB: ENGINEER'S OFFICE

AB 5 **CONSTRUCTION**

PS AB 5.6 **SURVEY EQUIPMENT**

The Contractor shall provide the following tested and approved survey equipment on site for the duration of the contract and for the use of the Employer's Agent whenever needed:

a) One tachometer capable of reading to minimum 20 seconds and maximum 6 seconds of arc, plus tripod;
b) One automatic level plus tripod;
c) Two tachometer staffs and one level staff, all graduated metrically; and
d) One 5m and one 100m tape measure.

The above-mentioned equipment may by arrangement be shared between the Contractor and the Employer's Agent's representative.

The Contractor shall keep the equipment continuously insured against any loss, damage or breakage, and he shall indemnify the Employer's Agent and the Employer against any claims in this regard.

The Contractor shall maintain the equipment in good working order and keep it clean throughout the contract period.

AB 8 **MEASUREMENT AND PAYMENT**

AB 8.2 **PAYMENT**

PS AB 8.2.2 **Telephone, Survey Assistants and Survey Equipment**

No payment shall be made for the telephone, survey assistants or survey equipment and all costs shall be deemed to be covered by the rates tendered for the Contractor's facilities

D 4 **PLANT**

PS D 5.1.4.1 **Dust nuisance**

Add the following to D 5.1.4.1:

The Contractor is responsible for dust control and is liable for all claims that may result from dust nuisance on all parts of the site and at all times from the date of handing over of the site to the completion date of the contract. No payment regarding the above-mentioned will be made and all costs shall be deemed to be covered by the tendered rates.

Should straw stabilisation be required, the Contractor shall programme his activities such that straw stabilisation is done immediately after the earthworks have been completed.

SABS 1200 DA: EARTHWORKS (SMALL WORKS)

PS DA 5.2.6.1**FREEHAUL**

The free haul area is to be 5 km x 5 km

SABS 1200 GA: CONCRETE (SMALL WORKS)

PS GA 2.3 **SPECIFICATIONS**

The successful bidder will have to submit a concrete mix design for this project through an accredited concrete laboratory. Costs are for the bidders account.

Payment for concrete will only be made after receiving 7 day test results back which achieves the minimum 7 day strength for concrete. Compressive strength of concrete at 7 days should be in the range of 70% of its characteristic compressive strength. Compressive strength of concrete at 28 days should not be less than 100% of its characteristic compressive strength

Concrete cubes are to be made and tested in accordance with SANS 5861

Test cubes

The following forms part of the specification regarding test cubes:-

- Payment for concrete will only be made after receiving 7 day test results back which achieves the minimum 7 day strength for concrete.
- **7 days tests will be taken & 28 day tests.** 14 day test results are not necessary.
- The contractor to provide a detailed drawing indicating where the tests were taken and positions of pour in relation to the tests to be numbered. This must be provided

and updated upon submission of test results. Failure to do so will result in non-payment.

- Tests are to be done by an accredited lab, different to the lab/plant supplying ready mix concrete.

SABS 1200 DK: GABIONS

PAYMENT

PS DK 8.2.1 The rate shall cover the cost of the supply of stones, binders and connectors, and the cost of loading, transporting, offloading, assembly and filling of the cages, and completion of the construction of the gabions.

Tenderers to note that the binding wire supplied by the gabion cage manufacturers is insufficient in quantity for the specification called. They do not allow stitching wire for multiple layers and for the sealing of the overlaps on the geo-textile envelopes. Refer to the specification.

No additional costs due to binding wire shortages will be entertained.

Tenderers to note that payment will only be made for completed and closed gabion baskets. No payment shall be made for open gabions.

PS DK 8.2.4 The area measured will be that of the gabion face scheduled or ordered to be backed with geotextile (or geomembrane).

The rate shall cover the cost of cutting, waste, placing, joining, overlapping and fastening the geotextile (or geomembrane) in position.

ADDITIONAL PROJECT SPECIFICATIONS

SABS CEMENT SPECIFICATIONS

All cement used during construction shall comply with SABS EN 197-1 for common cements and SABS EN 413-1 for masonry cement. Any reference to SABS 471 in the standard specifications shall be replaced with the new specification SABS EN 197-1: Cement compositions, specifications and conformity criteria: Part 1: Common cements.

Where the old SABS 471 product nomenclature has been used in the standard specifications, the contractor shall supply and use the relevant new product, in compliance with SABS EN 197-1.

MATERIALS

The contractor, when using materials that are required to comply with any standard specification, shall, if so ordered, furnish the engineer with certificates showing that the materials do so comply.

Where so specified, materials shall bear the official mark of the appropriate authority. Samples ordered or specified shall be delivered to the engineer's office on the site free of charge. Where proprietary products have been specified, similar products may be used subject to the prior written approval of the engineer.

Unless otherwise specified, all proprietary materials shall be used and placed in strict accordance with the relevant manufacturer's current published instructions. Unless anything to the contrary is specified, all manufactured articles or materials supplied by the contractor for the permanent works shall be unused.

Earth, stone, gravel, sand, and all other materials excavated or present on the site or in borrow areas provided by the employer shall not become the property of the contractor, but will be at his disposal only in so far as they are approved for use on the contract. Existing structures on the site shall remain the property of the employer and except as and to the extent required elsewhere in the contract, shall not be interfered with by the contractor in any way.

Existing structures on the site shall remain the property of the employer and except as and to the extent required elsewhere in the contract, shall not be interfered with by the contractor in any way.

No materials to be included in the works shall be damaged in any way and, should they be damaged on delivery or by the contractor during handling, transportation, storage, installation or testing they shall be replaced by the contractor at his own expense.

All places where materials are being manufactured or obtained for use in the works, and all the processes in their entirety connected therewith shall be open to inspection by the engineer (or other persons authorised by the engineer) at all reasonable times, and the engineer shall be at liberty to suspend any portion of work which is not being executed in conformity with these specifications.

The contractor shall satisfy himself that any quarry selected for use provides the necessary mined material in accordance with the specification.

(a) Ordering of materials

Immediately upon his bid being accepted, the contractor shall order materials which are in short supply or for which the delivery period may be long.

The quantities set out in the bill of quantities have been determined from calculations based on data available at the time and should therefore be considered to be only approximate quantities. The contractor shall therefore, before ordering materials of any kind, check with the engineer the quantities required. No liability or responsibility whatsoever shall attach to the employer for materials ordered by the contractor except if they have been ordered in accordance with written confirmation issued by the engineer.

CLEARING AND REMOVING ALIEN VEGETATION

The unit of measurement for clearing and removing alien vegetation is the hectare. The quantity shall be taken as the area in hectares (to the nearest 0.01 ha) designated by the engineer and cleared of alien vegetation.

The tendered rate shall include full compensation for all labour, plant, materials, equipment and incidentals required to remove alien vegetation and disposal thereof at a landfill licenced in terms of the applicable legislation. Material obtained from clearing and grubbing shall be disposed of at a landfill licensed in terms of the applicable legislation

The rate shall also provide for the cost related to treating the remaining stumps with an approved herbicide (including supply of herbicide).

All cutting and re-cutting of stumps and trees to be cut maximum 50mm above natural ground level land/or water line. All existing trees and shrubs as well as cut trees/branches/etc. with a diameter of below 50mm must be cleared and removed from site.

All biomass alien brush with a diameter of less than 50mm must be cut down to ankle height with the correct application of herbicide supplied by contractor such as (Hatchet/Seismic).

All material must be removed from riparian zone out of flood line and stacked into heaps by hand for disposal hereafter by the contractor.

When cutting reeds, the following operation process must be followed:-

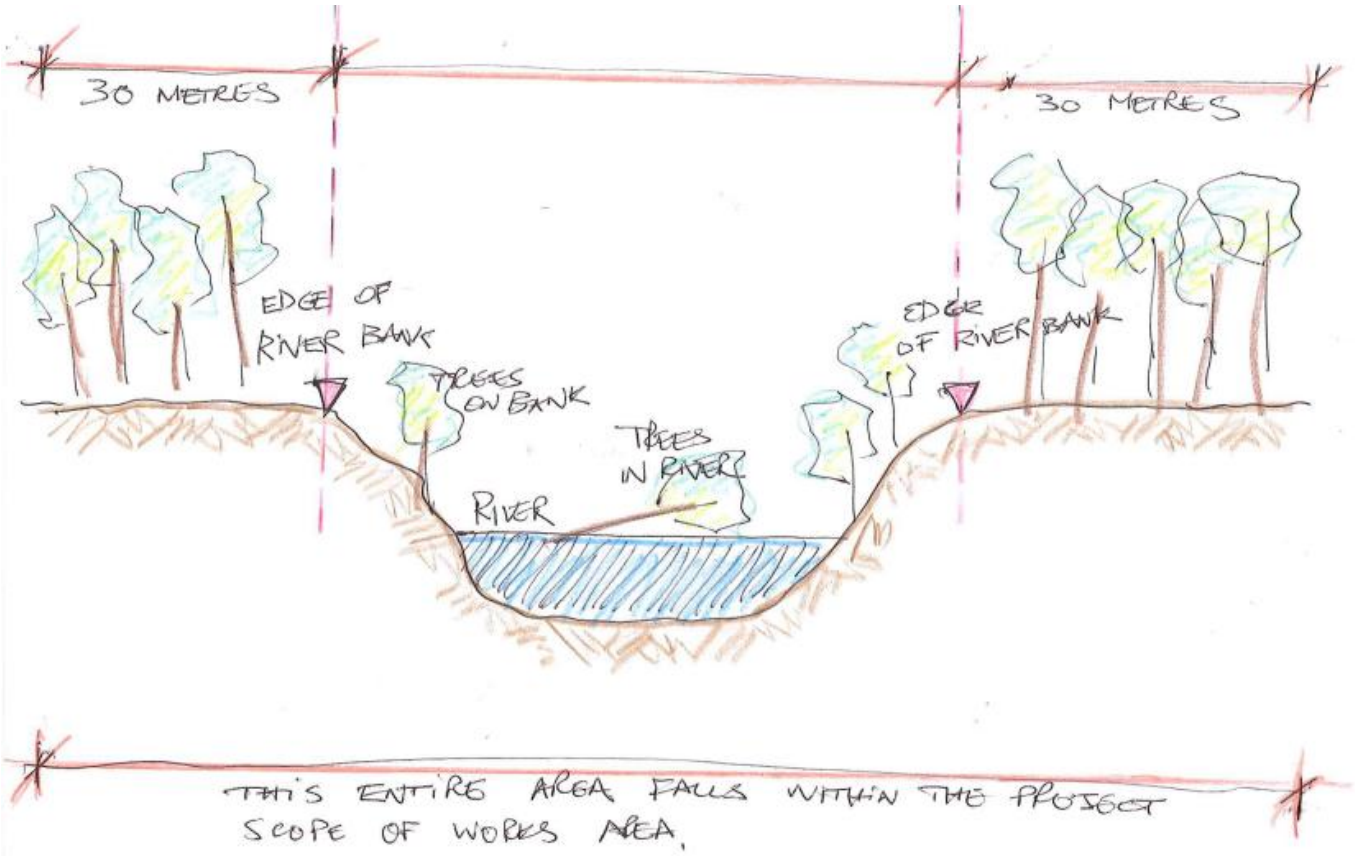
- Initial first cut and leave the reeds for 3 weeks.
- Thereafter spray the reeds with a “wetter/benatter” and then apply correct herbicide.
- Recut reeds hereafter 3 weeks later.
- Respray for second time as specified above.
- Recut thereafter 3 weeks later & apply final “wetter” & herbicide

Follow up alien clearing will be held to the same specifications above.

Demarcation of riparian 30 metre zone

The extent of the riparian zone is demarcated on the attached Alien Clearing map:

Due to previous discrepancies on past contracts and the drought conditions faced, the demarcation of the 30 metre “red zone” will be defined as below and will be used as the standard unit of measure for the hectares to be cleaned.



Contractor to cut trees on both sides of river.

GEOTEXTILE FABRIC – BIDIM A4

Geotextile Fabric is to be Bidim A4 (or similar approved by the Employer's Agent)

The Contractor shall, at least 45 days before the installation of the geotextile, submit to the Employer's Agent samples of the geotextile(s) he proposes to use so that the Employer's Agent may test the geotextile and confirm the use thereof if he is satisfied that it meets the specified requirements.

No extra payment shall be made for providing the samples for testing.

Please see data sheet below.

Casidra

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ENGINEERED FABRICS

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TECHNICAL DATA SHEET
WITH NEW SANS STANDARDS

Product Name: **bidim**

Reference No: DS FLTR 0587-08/2014

Description: "A" Range Nonwoven, Needle punched, Continuous Filament, Polyester Geotextile Manufactured in RSA in accordance to ISO 9001:2008, Registration No: LS1176

			A1	A2	A3	A4	A5	A6	A7	A8	A10	
Mechanical Properties												
Thickness under 2 kPa	Thickness	mm	1.2	1.4	1.6	1.8	2.6	3.1	4.4	5.2	6.4	SANS 9863-1:13 / ISO 9863-1:05
Tensile Strength (200mm wide strip)	Weaker Direction	Typical kN/m	7.8	9.0	11.5	14.0	19.5	26.0	40.0	50.0	56.0	*SANS 1525:13 / ISO 10319:08
		MARV kN/m	7.0	8.1	10.3	12.6	17.2	22.2	35.0	46.0	50.0	
	Elongation	%	50 – 70									
Static Puncture Strength	CBR	Typical kN	1.5	1.9	2.2	2.7	3.6	4.8	7.1	9.5	11.7	*SANS 12236:13 / ISO 12236:06
		MARV kN	1.3	1.7	2.0	2.5	3.4	4.3	6.5	9.0	11.0	
Puncture Resistance	Diameter of hole (max)	mm	30	27	25	19	16	13	8	6	3	SANS 13433:13 / ISO 13433:06
Trapezoidal Tear Strength	Weaker Direction	Typical N	240	320	375	440	600	800	1200	1600	2100	ASTM D4533
		MARV N	205	245	330	375	500	650	1050	1330	1950	
Grab Strength	Weaker Direction	Typical N	500	600	730	900	1250	1550	2500	3260	4700	ASTM D4632
		MARV N	450	525	700	850	1100	1410	2100	2815	3700	
	Elongation	%	50 - 80									
UV Stability	70% strength retained after 1000 hours											ASTM D4355
Hydraulic Properties												
Normal Throughflow	@ 50mm head	ℓ/s/m²	200	150	125	100	80	70	45	30	20	SANS 11058:13 / ISO 11058:10
In-plane Throughflow	Flow Rate (per m width)	ℓ/hr	20	30	35	40	50	55	75	120	130	ISO 12958:10
Permeability	@ 50mm head	m/s x10⁻³	4.8	4.2	4.0	3.6	4.2	4.3	4.0	3.1	2.6	SANS 11058:13 / ISO 11058:10
Pore Size	$O_{90\,w}$	µm	200	170	155	138	132	130	114	< 75	< 75	SANS 12956:13 / ISO 12956:10
Roll Dimensions												
Width	Standard	m	1.32, 1.76, 2.65, 3.53 & 5.3					2.65 & 5.3				
Length	Standard	m	150	150	150	150	150	75	75	50	50	

The above values include both Typical and Minimum Average Roll Values (MARV) and are deduced through the specified test methods by an accredited laboratory.

*** Ten specimens per test according to SANS 9862:13 / ISO 9862:05 "Sampling and Preparation of Specimens"**

Kaytech reserves the right to make technical modifications to its products.

The information given in Kaytech's documentation is to the best of our knowledge true and correct. However, new research results and practical experience can make revisions necessary. No guarantee or liability can be drawn from the information mentioned herein. Furthermore, it is not Kaytech's intention to violate patents or licenses.

Issued: 18 August 2014

TENDER 11/2026

CONSTRUCTION OF EROSION PROTECTION STRUCTURES IN UPPER KEURBOOMS RIVER

BASELINE RISK ASSESSMENT REPORT

A baseline risk assessment focuses on the identification of risk that applies to the whole project. The purpose of conducting a baseline risk assessment is to establish a risk profile.

This is an initial risk assessment that focuses on a broad overview in order to determine the risk profile to be used in subsequent risk assessments. It is performed to obtain a benchmark of the types and size of potential hazards, which could have a significant impact on the whole project and all stakeholders.

The stakeholders need to identify the major and significant risks, then prioritise these risks and evaluate the effectiveness of current systems for risk control.

The risks for the above project which have been identified have been highlighted under the following categories:

1. **Scope of work (what is being built?)**

   This project consists of the following elements:

   The scope of works entails the construction of 10 (ten) gabion structures (groynes) and 1 (one) weir in the Upper Keurbooms over an approximate distance of 300 metres.

2. **Location of site and elements specific to the location (municipal by-laws, weather factors, geographical factors)**

   Location

   The site is situated 1 Kilometre West of Swellendam, Western Cape along the Upper Keurbooms.

Weather

Weather always poses a risk to any construction project. Therefore, the below information is important to manage this risk item accordingly.

The area normally receives about 24.66mm of rain per year, with most rainfall occurring mainly during winter. It receives the lowest rainfall (24.66mm) in December and the highest (47.56mm) in October. The monthly distribution of average daily maximum temperatures shows that the average midday temperatures for Swellendam range from 5.12°C in July to 27.8°C in February. The region is the coldest during July when the mercury drops to 6.4°C on average during the night.

There is the possibility of the river flooding if weather conditions are abnormal and large amounts of rain is present and/or dams releasing large quantities of water into the river.

3. Geo- technical risks (conditions of the soil, raise any concerns that may hinder the project progress)

The selected site is situated on one side of the river in aquatic and undulating conditions, as well as working in an active running riverbed. The density and growth of alien biomass varies from dense to sparse, from large to small.

Certain soil conditions could be waterlogged and muddy underfoot causing access to and on site impossible. The consent and approval of the local municipality and the community representatives will need to be obtained when creating access roads to the site.

Steep river banks will increase the risk of equipment and people falling in the river.

4. Environmental risks (This is the actual or potential threat of adverse effects on living organisms and environment by effluents, emissions, wastes, resource depletion, etc. involved in the construction phase)

The environmental risks associated with this site are as follows:

The nature of the construction work will take place directly in the riparian zone both sides of the Upper Keurbooms. Within this habitat there are indigenous plants/trees which have to be

protected, as well fauna which is present in this riparian zone. A high volume of bird life is present.

Due to the site being in an environmental area there is always the risk for soil, groundwater and surface water pollution and contamination when using mechanical plant, fuel and pesticides. It will not be allowed to dispose of any kind of waste by burying it on site.

Biomass not removed also poses a major threat, as this material just ends up in the river again and further exacerbate the current problem.

Movement of vehicles on farm access roads creates dust which in turn sits on farmers crops affecting their quality of produce.

Disturbance of ground and biomass increases the possibility of personell being attacked by snakes and bees.

5. Risk assessments based on scope of work (Is this a high-rise building in a built-up area? Is it working in a flood plain and/or river with eroded soil conditions?)

Groynes will be built into the sides of embankments right alongside river banks. Erosion, excavation slippage, floods, rain, loose & muddy conditions underfoot all pose risks while undertaking construction work.

Cutting logs at rivers edge also is evident and this restricted access poses risk to both the method of felling of tree and resources used in this operation.

Access to construction activities invariably means making access through landowner's farms through windbreaks, orchards, etc. This has to be managed so as to cause the least damage to infrastructure. Access to sites will mean using farmer's roads on their land. This will need to be coordinated as to where the impact is minimal on both farming operations and infrastructure.

Also, all the farms/resorts are working farms/resorts, so farm /resort workers and implementation is at risk regarding both transport and biomass removal.

6. Equipment Risks.

The equipment risks associated with this project is as follows:

This will be a mechanised job with large numbers of mechanised earth moving equipment in close proximity to people, infrastructure, and surrounding environment. This earth moving equipment has to gain access in limited space areas with treacherous ground conditions being stable and at times unstable.

7. Material Risks.

The following could pose risks associated with the project:

- Flammable materials such as diesel/petrol in a highly flammable environment
- Hazardous substances such as pesticides and herbicides will have to be used
- Cement potency for concrete works.

8. Ergonomic Risks (Ergonomic hazards refer to workplace conditions that pose the risk of injury to the musculoskeletal system of the worker).

The ergonomic risks associated with the above project are as follows:-

•Severe injury/death from falling trees
•Severe injury/death from mechanical plant
•Asphyxiation due to smoke inhalation if burning of biomass is done.
•Drowning due to falling in river.
•Humidity could be high working under canopy with high heat expected.
•Heat stroke due to high temperatures and extended periods of direct sunlight exposure.

9. Controls specific to client requirements (two-day induction, pink overalls, entrance to existing premises, etc.).

The list of client requirements applicable to this project is: -

- Working hours is 07h30 to 17h00 on weekdays and 07h30 to 15h00 on Saturdays

RISK OVERVIEW CHART FOR PROJECT:

LOCATION	High temperatures	Heat exhaustion of personnel	5

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	Rain	Worsen conditions underfoot & raise river level	2
GEOGRAPHICAL	Soil conditions aquatic and undulating	Difficult conditions to operate heavy machinery in to remove biomass.	4
ENVIRONMENTAL	Dust pollution	Dust will affect neighboring farmers crops	3
	Indigenous plants	Risk of damaging indigenous vegetation	2
	Soil contamination	Risk of pollution to ground & river by contaminants	4
	Snakes	Risk of being bitten by snakes	5
	Bees	Risk of being stung by bees	5
SCOPE OF WORK	Access to site	Access routes through various farm owners and access to riparian zone also difficult	3
	Water over & in water	Dangerous working in flowing river for personnel & equipment	4
EQUIPMENT	Mechanized earthmoving equipment	Working in difficult terrain and in close proximity to personnel	5
MATERIAL	Flammable material and pesticides	Dangerous to work with and to store	3

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ERGONOMIC	Falling trees	Injury or even loss of life can occur if safety measures are not in place during felling operations	5
	Drowning	Injury or even loss of life can occur if safety measures are not in place while working near or in river.	5
	Asphyxiation	Injury or even loss of life can occur when unplanned fires are started. Damage to infrastructure is a high probability	4
CLIENT REQUIREMENTS	Working hours	Only certain times when construction activity can take place	2

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Please find below risk assessment template which can be used by the contractor to manage the above identified risks.

Risk assessment							
Title:							
Company name:				Date assessment was carried out:			
Assessment carried out by:				Date of next review:			
Risk assessment Activity or area	**What are the hazards?**	**Who might be harmed and how?**	**What are you already doing?**	**What further action do you need to take?**	**Who needs to carry out the action?**	**When is the action needed by?**	**Done**

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TENDER 11/2026

CONSTRUCTION OF EROSION PROTECTION STRUCTURES IN UPPER KEURBOOMS RIVER

In terms of the Construction Regulations 2014 Regulation 5, a baseline risk assessment for the intended works is required to be done by the Client for each specific construction site.

This risk assessment will inform the site-specific Occupational Health and Safety specifications that must be supplied to the designer, who will supply any design specifications to be added and then supplied to the prospective Contractor (Bidder) as part of the tender documents. This specification must be translated into actions and preventative risk management measures by the Contractor that will form part the Occupational Health and Safety Plan of the Contractor.

This specification forms an integral part of the contract, and the Contractor is required to use it at pre-tender phase to make sufficient provision for related costs for risk management and after award of tender for the purpose of drawing up its project-specific construction phase health and safety plan.

It is the responsibility of the Contractor in the bidding process to:

- ensure that he include adequate provision for the cost for health and safety measures in his bid and
- Provide proof and include in his cost the necessary competencies and resources to perform the work safely.

The risks for the above project which have been identified, evaluated and resulted in the following specifications that are highlighted under the following categories:

This specification does not replace the requirement of the Contractor to comply with all relevant legislation and the regulations of the Occupational Health and Safety Act,

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but just highlight the specific identified and relevant risk factors that need special mention and attention by the Contractor in his bid.

1. **General administrative requirements**

DESIGNATION	NAME	CONTACT NO's	ADDRESS	RESPONSIBLE PERSON
Project Client				
Department of Labour				
Municipality				
Project Funder				

2. **Scope of work (what is being built?)**

   The scope of works entails **the construction of 21 (twenty one) gabion structures (groynes)** in the Keurbooms River over an approximate **distance of 1260 metres**

3. **Location of site and elements specific to the location (municipal by-laws, weather factors, geographical factors)**

What is the risk?	Heat and rain
Hazard Identification?	High temperatures together with high humidity.
Who will be injured & mechanism of injury?	All personnel working on site. Possible injury will vary from heat exhaustion and or broken ankles from muddy soil.

Preventative action recommended	
Description	**Category: Reduction/transfer/ control/avoidance**
• Monitor weather for worsening soil conditions on daily basis. When conditions underfoot do not assist with mechanical and/or personnel, call site off until conditions improve • Ensure for shade and sufficient water onsite for high temperatures. • Ensure temperature is monitored and call site off with WGT of 40 and higher	Risk reduction/ control

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What is the risk?	Cold and rain
Hazard Identification?	Low temperatures together with high wind factor.
Who will be injured & mechanism of injury?	All personnel working on site. Possible injury will vary from pneumonia and or broken ankles from muddy soil.

Preventative action recommended	
Description	**Category: Reduction/transfer/ control/avoidance**
• Monitor weather for worsening soil conditions on daily basis. When conditions underfoot do not assist with mechanical and/or personnel, call site off until conditions improve • Ensure for enclosures and shelters onsite for lower temperatures. • Ensure temperature is monitored and call site off with WGT of 40 and higher	Risk reduction/ control

4. Geo- technical risks (conditions of the soil, raise any concerns that may hinder the project progress)

What is the risk?	Soil conditions
Hazard Identification?	Difficult terrain
Who will be injured & mechanism of injury?	Infrastructure damage, damage to earthmoving equipment and personnel injury will vary from dislocation, broken bones to death

Preventative action recommended	
Description	**Category: Reduction/transfer/ control/avoidance**
This is specialized work that requires competent human resources that are adequately skilled in working with heavy and dangerous machinery in aquatic and undulating conditions. Guidelines and practical advice to all work operations to ensure effective and Proper management of high-risk areas must be in place. The contractor is hereby directed to the Casidra website to gain access to Working for Water Health & Safety Plan. This must be implemented as part of the contractors	Risk control

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Health & Safety plan. The document name is: • WfW Health & Safety Doc on website www.casidra.co.za	

5. Environmental risks (This is the actual or potential threat of adverse effects on living organisms and environment by effluents, emissions, wastes, resource depletion, etc involved in the construction phase)

What is the risk?	Dust pollution
Hazard Identification?	Dust affects neighbour's crops
Who will be injured & mechanism of injury?	Farmers infrastructures resources and both farm workers and personnel working on farm and site
Preventative action recommended	
Description	**Category: Reduction/transfer/ control/avoidance**
The Contractor is to take appropriate measures to minimise the generation of dust as a result of construction works, to the satisfaction of the Project Manager. A water truck must be on standby at all times to assist with this operation. Daily liaison must be done with the landowner to discuss vehicle movements in relation to dust pollution on crops.	Risk reduction

What is the risk?	Indigenous plants
Hazard Identification?	Risk of damage to environment
Who will be injured & mechanism of injury?	Plants trees, shrubs can be damaged and destroyed by mechanical equipment
Preventative action recommended	
Description	**Category: Reduction/transfer/ control/avoidance**
Due to the sensitive biodiversity within the riparian zone of the Berg River, the use of any equipment which has the potential to cause extensive damage to the river banks and indigenous flora may not be used. No firewood or plant material to be collected from natural veld.	Risk avoidance

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What is the risk?	Soil contamination
Hazard Identification?	Risk of pollution to ground and river by its contaminants
Who will be injured & mechanism of injury?	Environment and this invariably falls over to communities, which then in affect the members of the public

Preventative action recommended	
Description	**Category: Reduction/transfer/ control/avoidance**
Maintenance and service areas should be demarcated during site establishment and all maintenance and service activities contained so as to avoid any contamination of soil and / or water. All vehicles, equipment, fuel and petroleum services and tanks should be maintained in a good condition that prevents leakage and possible contamination of soil or water supplies. Refueling areas should be bunded and lined to prevent spilled fuels and oils from contaminating the ground or water. It is suggested that as a minimum, sandbags should be placed surrounding the bulk fuel supply tank. The floor of the area is to be lined with plastic and a layer of sand of approximately 50mm is placed on top of the plastic. Automatic shut-off nozzles are recommended on all dispensing units. The park and service area should be treated with a suitable hydrocarbon absorption or remediation product. Absorbent spill mop-up products should to be on hand. All servicing should be done with a drip tray present to prevent accidental spillage of oils and fuels. A suitable leak proof container for the storage of oiled equipment (filters, drip tray contents and oil changes, etc.) should be established. All spills to be immediately contained, reported to the Project Manager, and dealt with.	Risk control/ reduction

What is the risk?	Snakes
Hazard Identification?	Being bitten by snakes
Who will be injured & mechanism of injury?	Personnel working on site

Preventative action recommended	
Description	**Category: Reduction/transfer/ control/avoidance**
As the work entails working in dense brush and biomass areas, the risk of disturbing a snake is very high. Make sure that all personnel are made aware of the increased risk of the presence of snakes. Wear proper protective clothing to protect against snake bites. An increased awareness and alertness is the best protection, the snake will not be looking	Risk reduction/control/ avoidance

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for you, so watch for it. If a snake is seen or reported on site, note the area of the snake and work in this area stops until the hazard is removed. DO NOT approach, attack or otherwise provoke the snake as 95% of those bitten have done this. REMEMBER - IF PROVOKED IT WILL STRIKE. If bitten, the following procedures should apply: 1. Immediately apply a broad firm bandage around the limb and on the bitten area. It should be as tight as one would bind a sprained ankle. As much of the limb should be bandaged as possible. Bind from below upwards. Crepe bandages are ideal, but any flexible material can be used, e.g. tear up clothing or old towels into strips. Panty hose is satisfactory. 2. Keep the limb and the victim as still as possible. Splint the limb. 3. Bring transport to the victim if possible. 4. Leave the bandage and splint on until medical care is reached. Don't cut or excise the bitten area. Don't apply an arterial tourniquet. Don't wash the bitten area. The snake involved may be identified by the detection of venom on the skin.	

What is the risk?	Bees
Hazard Identification?	Being stung by bees
Who will be injured & mechanism of injury?	Personnel working on site

Preventative action recommended	
Description	**Category: Reduction/transfer/ control/avoidance**
Upon finding a bee hive/nest, do not try to get rid of the nest or hive yourself. Each type of insect or situation will likely need different removal methods. It is best to call pest control professionals for this service. Upon being stung, most people experience local effects like pain, swelling, itching, and redness around the sting site. In rare cases, a **severe allergic reaction** can occur. This situation is serious and can cause "**anaphylaxis**" or anaphylactic shock. Symptoms of anaphylaxis can appear immediately (within	Risk avoidance/control/reduction/transfer

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minutes) or up to 30 minutes later. Symptoms to watch for include:

- hives, itching and swelling in areas other than the sting site,
- swollen eyes and eyelids,
- wheezing,
- tightness in the chest and difficulty breathing,
- hoarse voice or swelling of the tongue,
- dizziness or sharp drop in blood pressure,
- shock,
- Unconsciousness or cardiac arrest.

Although most deaths result from severe allergic reactions, some are caused by direct toxicity of the insect venom. Of those who die from a severe allergic reaction to a sting, half die within 30 minutes, and three-quarters within 45 minutes. If you see any signs of reaction, or even if you are not sure, call or have a co-worker call the emergency medical services right away. Also, get medical help if the sting is near the eyes, nose or throat. People who have been stung multiple times (such as when fleeing from a swarm or nest) can sometimes suffer serious health effects. While rare, death may occur.

Employers should be notified if a worker, especially one who works outdoors, has allergies to insect stings. Co-workers should be trained in emergency first aid, be aware of the signs of a severe reaction, and know how to use the bee sting kit (self-injectable epinephrine). Always carry a cellular phone in case you need emergency medical help.

The best way to prevent stings is to avoid the insects. Leave the area, if possible. If there is a travelling swarm, they will likely leave within a few days.

Note that insect repellent ("bug spray") does not affect these stinging insects. Avoidance and awareness are the keys to not being stung.

Before working at a site:

- Take a look around. Check to see if there are any visible signs of activity or a hive or nest. If you see a number of insects flying around, check to see if they are entering and exiting from the same hole or place. If so, it is likely a nest or a source of food.
- Wear long sleeve shirts, and long pants. If you cannot avoid working near bees or wasps, wear a bee-keepers style hat with netting to cover your head, neck and shoulders. Tape your pant legs to

your boots/socks, and your sleeves to your gloves. You may also wish to wear an extra layer of clothing since wasp stings are long enough to reach through one layer of clothing.

- Power tools such as lawnmowers, weed eaters and chainsaws will aggravate the insects. When using these tools, be aware that the tools may provoke the insects or in some cases, cause the insects to swarm.

If you find you are working near stinging insects, here are some tips.

- Most bees and wasps will not sting unless they are startled or attacked. Do not swat at them or make fast movements. The best option is to let the insects fly away on their own. If you must, walk away slowly, or gently "blow" them away. The only exception is if you have disturbed a nest and hear "wild" buzzing. Protect your face with your hands and run from the area immediately.
- Wear light coloured clothes such as khakis, beige, or blue. Avoid brightly coloured, patterned, or black clothing.
- Tie back long hair to avoid bees or wasps from getting entangled in your hair.
- Be careful when shaking out clothing or towels as the insects could be inside the folds.
- If you find a bee or wasp in your car, take a thick cloth and cover the insect before it gets frightened. Carefully, let the insect back outside through an open window.

DO NOT

- Do not wear perfumes, colognes, scented soaps, or powders as they contain fragrances that are attractive.
- Do not go barefoot or wear sandals, especially in areas where there is clover or other flowering plants that attract bees.

6. Risk assessments based on scope of work (Is this a high rise building in a built up area? Is it working in a flood plain and/or river with eroded soil conditions?)

What is the risk?	Water
Hazard Identification?	Dangerous medium to work both in/on with mechanized equipment & personnel
Who will be injured & mechanism of injury?	Damage to equipment and personnel injury will vary from dislocation, drowning, broken bones to death

Preventative action recommended	
Description	**Category: Reduction/transfer/ control/avoidance**
As with all work activities, working over, on, or near water needs to be carried out in a safe and healthy manner adopting appropriate control measures to minimize risks and mitigate the effects of any incident. General controls that may need to be adopted when work is carried out over, on, or near water include provision of appropriate platforms and gangways; safety nets and safety harnesses; illumination; first aid equipment; personal protective equipment and clothing, including personal buoyancy equipment; suitable means of access to and egress from the location; and suitable rescue equipment and procedures. No river work should be carried out by someone working alone. Inspections from the bank may be permitted, but lone working procedures should apply with a short call-in period to the monitoring base. A frequent check that a good telephone signal is available should be made, and the monitoring base should be informed of the location (including which bank) and the direction of travel of any lone worker. A buoyancy aid should be worn. In determining the risk at each site, it is important to: • Assess how quickly water levels can rise; • Prepare an evacuation procedure that will ensure that all personnel – if not equipment – are out of the river before conditions become hazardous.	Risk reduction/control

What is the risk?	Access to Biomass
Hazard Identification?	Environmental impacts
Who will be injured & mechanism of injury?	Infrastructure

Preventative action recommended	
Description	**Category: Reduction/transfer/ control/avoidance**
Site access should be monitored and controlled and all access routes should be clearly demarcated in order to minimise environmental impacts. A constant regard must be taken to safety and dangerous areas and should be adequately cordoned off to prevent accidental injury	Risk avoidance

What is the risk?	Access to site / movement
Hazard Identification?	A construction is a dangerous environment regarding vehicles, materials and constant flow of traffic/material and personnel
Who will be injured & mechanism of injury?	Public will be injured and/or killed

Preventative action recommended	
Description	**Category: Reduction/transfer/control/avoidance**
Construction work should be fenced off and suitably signed. This will protect people from site dangers and the site from vandalism and theft. Site access should be monitored and controlled and all access routes should be clearly demarcated. A constant regard must be taken to safety and dangerous areas and should be adequately cordoned off to prevent accidental injury. Temporary fencing/hoarding with appropriate warning signs must be in place. Make sure there is a system to ensure necessary precautions are kept in place during working hours and that night-time and weekend protection is put in place as required before the site closes	Risk control

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What is the risk?	Structural stability
Hazard Identification?	Unstable working platforms could cause risk of collapse on trenches. Risk of excavations collapsing and burying or injuring people working in them; material falling from the sides into any excavation; and people or plant falling into excavations
Who will be injured & mechanism of injury?	Risk that people be killed or seriously injured by collapses and falling materials while working in excavations

Preventative action recommended	
Description	**Category: Reduction/transfer/control/avoidance**
<u>COLLAPSE OF EXCAVATIONS</u> **Temporary support** – Before digging any trench pit, tunnel, or other excavations, decide what temporary support will be required and plan the precautions to be taken. Make sure the equipment and precautions needed (trench sheets, props, baulks etc) are available on site **before** work starts. **Battering the excavation sides** – Battering the excavation sides to a safe angle of repose may also make the excavation safer. In granular soils, the angle of slope should be less than the natural angle of repose of the material being excavated. In wet ground a considerably flatter slope will be required **<u>FALLING OR DISLODGING MATERIAL</u>** **Loose materials** – may fall from spoil heaps into the excavation. Edge protection should include toeboards or other means, such as projecting trench sheets or box sides to protect against falling materials. Head protection should be worn. **Undermining other structures** – Check that excavations do not undermine scaffold footings, buried services or the foundations of nearby buildings or walls. Decide if extra support for the structure is needed before you start. Surveys of the foundations and the advice of a structural engineer may be required. **Effect of plant and vehicles** – Do not park plant and vehicles close to the sides of excavations. The extra loadings can make the sides of excavations more likely to collapse. **<u>FALLING INTO EXCAVATIONS</u>** **Prevent people from falling** – Edges of excavations	Risk reduction/avoidance

should be protected with substantial barriers where people are liable to fall into them. To achieve this, use: • Guard rails and toe boards inserted into the ground immediately next to the supported excavation side; or • fabricated guard rail assemblies that connect to the sides of the trench box • the support system itself, eg using trench box extensions or trench sheets longer than the trench depth. **INSPECTION** A competent person who fully understands the dangers and necessary precautions should inspect the excavation at the start of each shift. Excavations should also be inspected after any event that may have affected their strength or stability, or after a fall of rock or earth. A record of the inspections will be required and any faults that are found should be corrected immediately.	

7. Equipment Risks

What is the risk?	Mechanized earthmoving equipment
Hazard Identification?	Collision of mechanized plant in difficult overgrown terrain & environmental damage
Who will be injured & mechanism of injury?	Infrastructure damage, damage to earthmoving equipment and personnel injury will vary from dislocation, broken bones to death

Preventative action recommended	
Description	**Category: Reduction/transfer/ control/avoidance**
This is specialized work that requires competent human resources that are adequately skilled in working with heavy and dangerous machinery in aquatic and undulating conditions.	Risk Control

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Guidelines and practical advice to all work operations to ensure effective and proper management of working with mechanical plant must be in place. Toolbox talks MUST make all personnel aware of the dangers. Equipment must be checked for proper working controls such as reverse warning sirens, etc. The contractor is hereby directed to the Casidra website to gain access to Working for Water Health & Safety Plan. This must be implemented as part of the contractors Health & Safety plan. The document name is:- • WfW Health & Safety Doc on website www.casidra.co.za	

8. Material Risks

What is the risk?	Herbicide material
Hazard Identification?	Working with toxic/hazardous material
Who will be injured & mechanism of injury?	Personnel working with herbicide and surrounding eco environment
Preventative action recommended	
Description	**Category: Reduction/transfer/ control/avoidance**
Personal injury, spillage, wastage and defective equipment can cause serious damage if not managed properly. Guidelines and practical advice to work operations to ensure effective and proper management of herbicide must be in place. The contractor is hereby directed to the Casidra website to gain access to Working for Water Health & Safety Plan. This must be implemented as part of the contractors Health & Safety plan. The document name is:- • WfW Health & Safety Doc on website www.casidra.co.za	Risk control

What is the risk?	Flammable material
Hazard Identification?	Dangerous to work with and store for prevention of fires
Who will be injured &	Infrastructure damage and injury or death to all persons

mechanism of injury?	
Preventative action recommended	
Description	**Category: Reduction/transfer/ control/avoidance**
Fuels and flammable materials should be stored in suitably equipped storage areas demarcated within the Contractor's camp. These areas must comply with general fire safety requirements. No fuel may be stored within drainage lines or areas. Impervious lining materials should be used in these storage areas to prevent contamination of the ground in the event of spillages or leaks, and automatic shut-off nozzles should be used on all dispensing units. Quantities of fuels and flammable/hazardous materials stored on site should be appropriate to the requirement for these substances on site. Fuels and oils should be safely located out of harm's way from the elements. No fuel / oil containers may be left unattended within drainage areas. All open containers containing used oil, etc., should be kept under roof or have adequate water tight lids. All spills to be immediately contained, reported to the Project Manager and dealt with. Adequate fire fighting equipment should be available on site, in good working order, and according to the fire hazard present during construction activities of at least one type ABC all-purpose 12.5kg extinguisher and a water cart with a minimum capacity of 1000 litres for the duration of the contract. Any welding, gas cutting or cutting of metal should only be permitted inside the demarcated working areas for this purpose and these areas should be approved by the Project Manager.	Risk control

9. Ergonomic Risks (Ergonomic hazards refer to workplace conditions that pose the risk of injury to the musculoskeletal system of the worker).

What is the risk?	Drowning, Asphyxiation & felling
Hazard Identification?	On-site injuries due to physical alien biomass clearing taking place
Who will be injured & mechanism of injury?	Personnel injury will vary from dislocation, broken bones to death
Preventative action recommended	
Description	**Category: Reduction/transfer/**

	control/avoidance
Guidelines and practical advice to all work operations to ensure effective and proper management of high risk areas must be in place. The contractor is hereby directed to the Casidra website to gain access to Working for Water Health & Safety Plan. This must be implemented as part of the contractors Health & Safety plan. The document name is:- • WfW Health & Safety Doc on website www.casidra.co.zsa	Risk reduction/transfer/ control/avoidance

10. Controls specific to client requirements (two day induction, pink overalls, entrance to existing premises, etc.)

What is the risk?	Data Collection
Hazard Identification?	Inaccurate or incomplete data
Who will be injured & mechanism of injury?	Project will suffer as information is needed for budgeting for future projects and reporting against job creation
Preventative action recommended	
Description	**Category: Reduction/transfer/ control/avoidance**
Ensure that all data records are kept on site in a file, and that information is distributed on a weekly basis so as to ensure that the capturing is done and that on-site activities are measured.	Risk control

11. Personal Protective Equipment (PPE) and Clothing

The principal contractor and other contractors shall ensure that all workers are issued with protective clothing free of charge and make use of the equipment and protection provided such as to wear hard hats, protective footwear, overalls, etc. The Principal Contractor and all Contractors shall make provision and keep adequate quantities of SABS approved PPE on site at all times. The Principal Contractor shall clearly outline procedures to follow when PPE or Clothing is:

- Lost or stolen;

- Worn out or damaged

The above procedure applies to Contractors and their Sub-contractors, as they are all employers in their own right, as per section 37 (2) of the Act.

(The general PPE requirements are attached under Annexure A to this document as well as an additional list of PPE for biomass removal is also attached as Addendum B to this specification).

12. Occupational Health and Safety signage

The Contractor shall provide and maintain adequate on-site OHS signage. Including but not limited to: 'no unauthorised entry', 'report to site office', 'beware of overhead work', 'hard hats, overalls, safety boots, respirators, etc.'. Signage shall be posted up at all entrances to site as well as on site in strategic locations e.g. access routes, stairways, entrances to structures and buildings, scaffolding, and other potential risk areas/operations

13. Fences and access

Construction sites in built-up areas or adjacent to public roads must be suitable and sufficiently fenced off and provided with controlled access points to prevent the entry of unauthorised persons.

14. Admittance to site

A notice must be posted up at every entrance to a building site prohibiting the entry of unauthorised persons to such workplace and no person shall enter such a site without the permission of the employer or user as the case may be. In no circumstances may the wording "Enter at Own Risk" be used

15. Speed Restrictions, construction vehicles and Protection

The Principal Contractor shall ensure that all persons in its employment, all Contractors, and all those that are visiting the site are aware and comply with the site speed restriction(s) and route identification for construction vehicles only. Separate vehicle and pedestrian access routes shall be provided, maintained, controlled, and enforced.

16. Hazardous Chemical Substances (HCS)

The Principal Contractor and other relevant Contractors shall provide the necessary training and information regarding the use, transport, and storage of HCS. The Principal Contractor

shall ensure that the use, transport, and storage of HCS is carried out as prescribed by the HCS Regulations. The Contractor shall ensure that all hazardous chemicals on site have a Material Safety Data Sheet (MSDS) on site and the users are made aware of the hazards and precautions that need to be taken when using the chemicals. The First Aiders must be made aware of the MSDS and how to treat HCS incidents appropriately.

The below acts are relevant regarding the transporting, storage and application of these agricultural chemicals:

- Fertilizers, farm feeds, agricultural remedies and stock remedies act, 1947 (Act no. 36 of 1947)
- Hazardous Substances Amendment Act, No. 53 of 1992
- The South African National Pesticide registration authority registrar: Act no. 36 of 1947

17. Public and Site Visitor Health and Safety

The Principal Contractor shall ensure that every person working on or visiting the site, as well as the public in general, shall be made aware of the dangers likely to arise from site activities, including the precautions to be taken to avoid or minimise those dangers. Appropriate health and safety notices and signs shall be posted up, but shall not be the only measure taken.

The Principal Contractor has a duty in terms of the OHS Act 85/1993 to do all that is reasonably practicable to prevent members of the public and site visitors from being affected by the construction activities.

Site visitors must be briefed on the hazards and risks they may be exposed to and what measures are in place or should be taken to control these hazards and risks. A record of these 'inductions' must be kept on site in accordance with the Construction Regulations.

18. Occupational Hygiene

Exposure of workers to occupational health hazards and risks is very common in any work environment, especially in construction. Occupational exposure is a major problem and all contractors must ensure that proper health and hygiene measures are put in place to prevent exposure to these hazards. Prevent inhalation, ingestion, absorption, and noise induction.

Contractor must identify site-specific health risks for construction. e.g., cement dust, wet cement, wood-dust, noise, etc.

19. Welfare Facilities

The Principal Contractor must supply the following clean, hygienic and maintained facilities:

- Shower facilities, after consultation with employees or employee representative (1 shower for every 15 persons).
- Sufficient toilets (1 toilet per 30 workers) and hand washing facilities. Separate toilets needed for both males and females. Toilet paper must be provided.
- Changing facilities for each sex
- Sheltered eating areas
- Waste bins must be strategically placed and emptied regularly.

Workers who are far removed from their homes, reasonable and suitable living accommodation for the workers must be provided and adequate transportation between sites and homes where suitable living accommodation is not available.

20. Alcohol and other Drugs

No alcohol and other drugs will be allowed on site. No person may be under the influence of alcohol or any other drugs while on the construction site. Any person on prescription drugs must inform his/her superior, who shall in turn report this to the Principal Contractor forthwith.
Any person suffering from any illness/condition that may have a negative effect on his/her safety performance must report this to his/her superior, who shall in turn report this to the Principal Contractor forthwith. Any person suspected of being under the influence of alcohol
or other drugs must be sent home immediately, to report back the next day for a preliminary inquiry. A full disciplinary procedure must be followed by the Contractor concerned and a copy of the disciplinary action must be forwarded to the Principal Contractor for his records.

21. Other compliance requirements

Notwithstanding the Occupational Health & Safety Act, the contractor must also confirm to the following acts:

- Basic conditions of employment act 75 of 1997
- National Road Traffic Act 93 of 1996
- National Environmental Management: Biodiversity Act, no 10 of 2004
- National Veld and Forest Fire Act, no 101 of 1998.
- Fertilizers, Farm Feeds, Agricultural Remedies and Stock Remedies Amendment act

22. Management control measures and review

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Risk assessment of the site must be reviewed at least every 30 days. Based on the effectiveness of the existing measures, the safety plan must be adjusted to meet the new or existing identified deficiencies.

23. Electrical Safety

All persons who carry out or arrange for work of any description for **Casidra** in connection with electrical apparatus shall make themselves acquainted with the Occupational Health and Safety Act (Act 85 1993) with particular reference to the Electrical Machinery Regulations, Regulations 1 to 23 inclusive.

The works performed under this contract shall comply in every respect with the latest relevant rules and regulations including following:

- Occupational Safety and Health Act (OSH Act)
- The South African Bureau of Standards Code of Practice SANS 10142
- Normal requirements laid down by Eskom.
- The latest requirements of the IEC and the British Standard Institute, where no SANS codes of practice exist.
- All rules and regulations issued by local and other authorities having jurisdiction over the contract.

NOTE:
The Electrical Installation Regulations clause 6 (2) require electrical contractors to register annually.

"(2) Any person who does electrical installation work as an electrical contractor shall register annually in the form of Annexure 3 with the chief inspector or a person appointed by the chief inspector "

In terms of the OHS Act Electrical Installation Regulations, a Certificate of Compliance (CoC) must be issued by a registered person, defined as "a person registered as an electrical tester for single phase, an installation electrician, or a master installation electrician". Registered persons may be the owners or employees of electrical contractors. They must be currently registered with the Department of Labour (DoL), and registrations must be renewed annually, bi-annually or every three years depending on the application. No company may do electrical contracting work unless they have a permanently employed registered person as part of the company.

Department of Labour stating the certification as either 'single phase tester", "installation electrician" or "master installation electrician" with a unique licence number

Safety equipment
The following equipment required for working on electrical installations and distribution systems, must be maintained in good order and repair and must be made available:

Safety belt, overalls, hard hat, safety shoes or boots, rubber gloves, "Men Working" notice boards, locks for locking off switches, buss bar shutters in truck-type switchgear, isolators or earthing links, rubber sheet and length of rope with short circuiting earthing-chains, earthing sticks and testing/phasing sticks rated for the voltage of the equipment to be tested.

Under no circumstances shall work be carried out on electrical apparatus unless the proper safety equipment is used

With regard to overhead linesmen, no work shall be carried out unless use is made of a non-metallic ladder and the appropriate safety belt, rubber gloves, overalls, hardhat and safety shoes or boots are worn. The buddy system must also be implemented.

Earthing
Always safety test before applying earths

Risk assessment of the site must be reviewed at least every 30 days. Based on the effectiveness of the existing measures, the safety plan must be adjusted to meet the new or existing.

At completion of the electrical installation work in the tender, a test as required must be performed to ensure safe operation of the equipment and a signed original CoC be supplied to the client.

24. Asbestos

Under no circumstances shall any work of any nature whatsoever on any **ASBESTOS** material be undertaken unless the work is entrusted and mandated to a "**REGISTERED ASBESTOS CONTRACTOR**" in terms of the Asbestos Regulations

ADDENDUM A – GENERAL MINIMUM PPE REQUIREMENTS

Subject	Requirement
*PPE needs analysis	Need for PPE identified and prescribed in writing. PPE remain property of Employer, not to be removed from premises GSR 2(4)
*Head Protection	All persons on site wearing Safety Helmets including Sub-contractors and Visitors (where prescribed)
*Foot Protection	All employees on site wearing Safety Footwear including Gumboots for concrete / wet work and non-slip shoes for roof work. Visitors to wear same upon request or where prescribed
*Eye and Face Protection	Eye and Face (also Hand and Body) Protection (Goggles, Face Shields, Welding Helmets etc.) used when operating the following: * Jack/ Kango Hammers * Angle / Bench Grinders * Electric Drills (Overhead work into concrete / cement / bricks * Explosive Powered tools * Concrete Vibrators / Pokers * Hammers & Chisels * Cutting / Welding Torches * Cutting Tools and Equipment * Guillotines and Benders * Shears * Sanders and Sanding Machines * CO2 and Arc Welding Equipment * Skill / Bench Saws * Spray Painting Equipment etc.
*Hearing Protection	Hearing Protectors (Muffs, plugs etc.) used when operating the following: * Jack / Kango Hammers * Explosive Powered Tools * Wood/Aluminium Working Machines e.g., saws, planers, routers
*Hand Protection	Protective Gloves worn by employees handling / using: * Cement / Bricks / Steel / Chemicals * Welding Equipment * Hammers & Chisels * Jack / Kango Hammers etc.
*Respiratory Protection	Suitable/efficient prescribed Respirators worn correctly by employees handling / using: * Dry cement * Dusty areas * Hazardous chemicals

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	* Angle Grinders * Spray Painting etc.
*Fall Prevention Equipment	Suitable Safety Belts / Fall Arrest Equipment correctly used by persons working on / in unguarded, elevated positions e.g.: * Scaffolding * Riggers * Lift shafts * Edge work * Ring beam edges etc. Other methods of fall prevention applied e.g., catch nets
*Protective Clothing	All jobs requiring protective clothing (Overalls, Rain Wear, Welding Aprons etc.) Identified and clothing worn.
*PPE Issue & Control	Identified Equipment issued free of charge. All PPE maintained in good condition. (Regular checks). Workers instructed in the proper use & maintenance of PPE. Commitment obtained from wearer accepting conditions and to wear the PPE. Record of PPE issued kept on H&S File. PPE remain property of Employer, not to be removed from premises GSR 2(4)

UDC 624(083.75)
ICS 93;01.120

SABS 1200 DK:1996
First revision

SOUTH AFRICAN BUREAU OF STANDARDS

STANDARDIZED SPECIFICATION

for

CIVIL ENGINEERING CONSTRUCTION

DK : GABIONS AND PITCHING

Approved by the

President of the
South African
Bureau of Standards
on 24 June 1996

Obtainable from the

South African
Bureau of Standards
Private Bag X191
Pretoria
Republic of South Africa
0001

Telegrams : Comparator, Pretoria
Telex : 321308SA
Fax : (012)344-1568

Published and printed in the Republic of South Africa by the
South African Bureau of Standards

ISBN 0-626-10826-8

Gr 7

Contents

First revision 24 June 1996
This specification supersedes
SABS 1200 DK:1984

Civil Engineering Construction - DK: Gabions and pitching

1 Scope

This specification covers the construction of gabions and stone pitching for the protection of earthworks against erosion. It covers gabion walls and aprons used as retaining walls, channel linings, and the like and it covers light to heavy pitching, with and without mortar.

NOTE — The standards referred to in the specification are listed in appendix A.

2 Interpretations

2.1 Supporting specifications

2.1.1 Where this specification is required for a project, the following specifications shall, *inter alia*, form part of the contract document (NOTE — Items (b) and (c) below may or need not be bound in the document):

a) Project specification;

b) SABS 1200 A or SABS 1200 AA or SABS 1200 AD, as applicable; and

c) SABS 1200 D or SABS 1200 DA, as applicable.

2.1.2 In addition to the specifications referred to in 2.1.1, one or more of the following specifications might be required for the project:

a) SABS 1200 C;

b) SABS 1200 DE;

c) SABS 1200 DM;

d) SABS 1200 DN; and

e) SABS 1200 G or SABS 1200 GA, as applicable.

2.2 Application

This specification contains clauses that are generally applicable to the construction of gabions and pitching. Interpretations and variations of the specification are set out in portion 2 of the project specification (see 2.1).

2.3 Definitions

For the purposes of this specification the definitions and abbreviations given in the applicable of the specifications listed in 2.1 and the following definitions shall apply:

2.3.1 **Box**: A gabion generally of depth 0,3 m to 1,0 m, of width 1,0 m, and of length 2 m to 4 m.

2.3.2 **Diaphragm**: An internal division of a gabion cage that is attached to the bottom, the sides, and, after the gabion cage is packed with stones, the lid of the cage.

2.3.3 **Gabion**: A cage of galvanized steel wire mesh (with or without PVC coating) that is packed with stones and is used in material retaining structures and in various situations to counter erosion. (A gabion can be in the form of a box or a mattress, depending on its dimensions.)

2.3.4 **Gabion cage**: An unfilled gabion.

2.3.5 **Geomembrane**: A sheet material that is highly impermeable to water and typically has an hydraulic conductivity of 1×10^{-14} m/s to 1×10^{-13} m/s.

2.3.6 **Geotextile**: A material in the form of a sheet, a blanket or a net that is permeable to water and typically has an hydraulic conductivity of 1×10^{-5} m/s to 1 m/s.

2.3.7 **Mattress**: A gabion generally of depth up to 0,5 m, of width 1,0 m or 2,0 m, and of length up to 6,0 m.

2.3.8 **Pitching**: Large stones placed systematically on a trimmed earth surface, to counter erosion.

2.3.9 **Selvedge/selvage**: A boundary or edge for the panels of a gabion cage that is intended to strengthen and facilitate connections between panels.

3 Materials

3.1 Gabions

3.1.1 Stone

3.1.1.1 Quality

Stone shall be clean, hard, unweathered, and free from fissures and flaking. It shall have a relative density of at least 2,65, and

a) when the stone is subjected to the weathering test given in 7.3, the loss of mass shall not exceed 5 %, and,

b) in the case of dolerites, when the stone is subjected to the durability test given in 7.4, the number of stones broken near their middle shall not exceed 5 %.

3.1.1.2 Size

No stone shall be of such a size that it will pass through a ring of diameter 10 % greater than the cross-dimension of the mesh being used for the gabion (dimension *b* in table 1).

No stone shall be of a size exceeding the maximum size given in column 5 of table 1, and at least 85 % of the stones shall be of a size equal to or exceeding the minimum size given in column 4, appropriate (in each case) to the nominal depth of the gabion and, when relevant, to the nominal mesh size.

Table 1 - Size of stones for gabions

1	2	3	4	5
Nominal depth of gabion cage m		**Nominal size of mesh (nominal cross-dimension *b* - as in SABS 1580)** mm	**Stone size (largest dimension)** mm	
Over	**Up to and including**		**Min.**	**Max.**
0,15	0,17	50	60	100
0,17	0,23	80	100	120
0,23	0,3	80	100	150
0,3	0,5	80	100	200
0,5	1,0	80	100	250

3.1.2 Gabion cages

Gabion boxes and mattresses shall comply the requirements of SABS 1580. They shall be to the dimensions shown on the drawings, specified in the project specification, or scheduled. The wire shall be polyvinyl-chloride (PVC) coated if so specified in the project specification or scheduled.

3.1.3 Geotextile

A geotextile blanket shall be made of fibres consisting of at least 85 % (by mass) of polypropylene, polyethylene, a polyester, a polyamide, or a co-polymer of vinyl chloride and vinylidene-chloride, or any combination of these polymers, and the polymer(s) shall contain such additives as are necessary to render the filaments resistant to the effects of ultraviolet radiation and heat.

The amount of water absorbed by a geotextile after it has been soaked in water at 20 °C for 24 h shall be less than 1 % (by mass) and its equivalent open size (EOS), strength and other properties shall be as specified in the project specification.

The Engineer's approval of the make and grade of the geotextile shall be obtained by the Contractor before the Contractor orders or uses any geotextile in the Works.

3.1.4 Geomembrane (impermeable membrane)

A geomembrane shall be either

a) an orange waterproof sheet of polyethelene that, except that the nominal thickness shall be at least 1 000 µm, complies with the relevant requirements of SABS 952 for type C sheet and bears the SABS certification mark; or

b) a material made from a woven or non-woven fabric that has been heat bonded or impregnated with bitumen or with a plastics material. The Engineer's approval of the make and grade of the geomembrane shall be obtained by the Contractor before the Contractor orders or uses any geomembrane in the Works.

3.1.5 Concrete

Where required in terms of 5.2.1, concrete shall comply with the relevant requirements of SABS 1200 G or SABS 1200 GA, as applicable.

3.2 Pitching

3.2.1 Stone

Stone for pitching shall comply with the requirements given in 3.1.1.1.

The dimensions and mass of any individual stone for pitching shall conform to the values given in columns 3 and 4 of table 2, appropriate to the type of pitching scheduled.

Table 2 - Size and mass of individual stones for pitching

1	2	3	4
Size/mass of pitching	**Thickness of pitching** mm, min.	**Least dimension** mm, min.	**Mass** kg, min.
Extra heavy	300	300	180
Heavy	400	190	50
Medium	300	150	27
Light	200	110	11

3.2.2 Grout

The cement used for grout shall comply with the relevant requirements of SABS ENV 197 and the fine aggregate shall comply with the relevant requirements for sand for concrete given in SABS 1083. The grout shall consist of a mortar comprising one part portland cement and four parts fine aggregate (by volume) mixed with enough water to give a consistency that will allow it, when assisted by spading or rodding, to flow under gravity into the voids. Where the pitching has a relatively high percentage of large voids, a portion of the fine aggregate may be replaced with a graded coarse aggregate that complies with the requirements of SABS 1083 for stone for concrete, except that the maximum size shall be 19 mm.

3.2.3 Wire netting

Wire netting shall be in the form of a 150 mm square mesh and shall be manufactured from plain, class A zinc-coated, mild steel wire that complies with the relevant requirements of SABS 675 and is of nominal diameter 4 mm.

4 Plant

Except for the production of the rock and stone and the fabrication of wire mesh and wire netting, gabion and pitching operations are predominantly labour-based. The Contractor shall provide such vehicles, cranes and pumps as are necessary to prepare foundations and to place materials in the manner specified.

5 Construction

5.1 Gabion cages

5.1.1 Binding and connecting wire

Sufficient lacing (binding) and connecting wire shall be supplied with the gabion cages to complete all the wiring operations that are necessary for the construction of all gabion walls and aprons as specified in 5.2.

5.1.2 Lacing of cages

Using adequate quantities of connecting and lacing (binding) wire, the Contractor shall complete the wiring in accordance with the manufacturer's instructions. The lacing together of the edges of adjoining boxes/mattresses and of diaphragms to side panels, and the lacing of lids shall be so carried out that, when the laced attachments are tested in accordance with 7.5, the force required to separate the edges, the diaphragms and the lids is at least 1,5 kN/m.

5.2 Gabion walls and aprons

5.2.1 Preparation of the foundation and surface for bedding

The bed on which gabion cages are to be laid before they are filled with rock shall be so levelled as to present an even surface at the depth shown on the drawings or as directed. If necessary, cavities between rock protrusions shall be filled with suitably sized material of a type similar to that specified in 3.1.1 and well compacted or, if so scheduled and ordered, such cavities shall be filled with well-punned grade 15 concrete. A foundation trench that runs along the toe of a revetment and in which gabions are to be laid, shall be excavated to the dimensions shown on the drawings or as directed.

5.2.2 Geotextile or geomembrane

Where and as scheduled, geotextile or geomembrane that complies with 3.1.3 or 3.1.4, as applicable, shall be placed in the positions shown on the drawings, on the top of the prepared bottom or on the sides, or on both, of each excavation before the gabion cages are placed. A geotextile shall be placed either

a) with an overlap of at least 300 mm that is securely fastened to prevent any movement or slipping during the placing of gabion cages and rock fill, or

b) provided that it is sewn or bonded in an approved manner, with an overlap of at least 75 mm. A geomembrane shall be joined by means of a welding process or an adhesive that has been approved and is used in accordance with the manufacturer's instructions.

5.2.3 Assembly

During erection and before the start of rock placing, each gabion cage shall be stretched, aligned, and wired to the adjacent cage. Wire braces in sufficient number to prevent the deformation of a cage as it is being filled with rock shall be connected between the vertical sides of each of the outer cells of each gabion cage. The lower braces shall be tensioned when the gabion cage is not more than one-third full and the upper braces when it is not more than two-thirds full. Where gabions of depth 0,5 m or more are to be used immediately downstream of weirs or where water could fall direct onto the gabions or where a neat upper face is required, similar vertical braces shall be used at spacings ordered by the Engineer.

The corners of adjacent gabion cages shall be securely wired together to provide a uniform surface. Where practicable, consecutive courses of gabion cages shall be staggered to avoid the coincidence of vertical joints.

Subject to prior approval, certain cages may be filled with rock before they are placed in situations of difficult access, such as under water.

5.2.4 Rockfilling

5.2.4.1 Gabion boxes in retaining walls

Particular care shall be exercised in filling against the faces of gabion boxes that will be exposed to view in the finished structure. Selected rock particles of adequate size shall be so packed as to obtain a fair-faced finish. Successive gabion boxes shall be filled in stages, to prevent deformation and bulging. They shall be filled to just below the level of the wire braces (see 5.2.3) and the braces shall then be twisted, windlass-style, to provide tension, after which the filling shall be completed, the boxes being slightly overfilled to provide for settlement. Care shall be taken to ensure that the lids of each course of gabion boxes are closed and laced before the next successive course of gabion boxes is placed, and that each box is filled evenly to a level surface ready to receive the next course of boxes.

5.2.4.2 Mattresses used in revetments and aprons

Gabion mattresses used to form aprons and revetments shall be filled by spreading random rock particles in at least two layers and, where so required in terms of the project specification, by so using selected rock particles for the top layer as to present the appearance of a dry stone pitched surface.

5.2.5 Final wiring

The closing and wiring-down of lids shall proceed as soon as is practicable after the filling operations. Lids shall be stretched tightly over the filling and wired down securely through each mesh along all edges, ends and diaphragms. The ends of all tying and bracing wires shall be turned into the gabion box or mattress on completion of the lacing operations.

5.2.6 Cutting and folding mesh

Only where shown on the drawings or where directed for the purpose of forming mitre joints, angles, curves or slopes that are not possible to obtain in structures with standard rectangular gabions, shall a gabion mesh be cut, folded and wired together. Such mesh shall be neatly cut, and the surplus mesh shall be completely removed, or folded back, or folded and tightly wired to an adjacent gabion face. The cut edges of the mesh shall be securely laced together with binding wire in the manner specified in 5.1.2. The assembly, filling and final wiring of re-shaped gabions shall otherwise be carried out as specified in 5.2.3 to 5.2.5.

5.2.7 Special finish

Where a special finish is ordered and scheduled, the outer face of the gabions shall be carefully packed by hand with selected stone of size 100 mm to 250 mm or as ordered.

5.3 Pitching

5.3.1 General

Pitching of the type scheduled shall be constructed on surfaces as and where shown on the drawings or as directed. No pitching shall be placed on any fill or surface that has not been trimmed, prepared, and compacted to at least 90 % of modified AASHTO maximum density. Where shown on the drawings or directed, backing of suitably sized free-draining stony material shall first be laid on the surface to be pitched, to the thickness specified.

Except where other forms of toe protection are shown on the drawings, a footing trench shall be excavated along each toe, and along all other edges of the area to be pitched, including edges that lie in stream beds, to enable the pitching to be extended for its own protection. Each trench shall be excavated to firm material but the vertical depth shall not exceed 1 m below ground, unless otherwise ordered.

The material excavated from the footing trench shall be subsequently backfilled against the toe pitching and compacted to at least 90 % of modified AASHTO maximum density, and the remainder shall be spread neatly.

5.3.2 Plain pitching

Starting at the toe, pitching shall be placed by firmly embedding each stone into the underlying material and against adjoining stones. Each stone shall be placed with the largest dimension at right angles to the slope and with its surfaces in close contact with stones previously placed.

Each stone shall be so placed that it breaks joint. Spaces between the larger stones shall be filled with spalls securely rammed into place in such a way that the larger stones do not bear on the spalls. The finished pitching shall present an even, tight surface.

Stones shall be placed individually. Dumping will not be permitted.

To minimize the effect of any differential settlement, the pitching shall be laid in horizontal lengths that are as long as is practicable. Vertical jointing in the direction of a slope shall be avoided.

5.3.3 Grouted pitching

Grouted pitching shall be laid as specified in 5.3.2. The surfaces of the stones to be grouted shall be cleaned of adhering dirt and soil and moistened with water before grout is applied.

Grout that has been mixed more than half an hour before the time of application shall not be used, and the manner of delivery of grout shall be subject to approval. Voids shall be filled by the grout's being laid over the pitching and being worked into the voids by spading, rodding and trowelling or other approved means.

The minimum depth of penetration of the grout below the top of the pitching surface shall be 150 mm, 190 mm, 230 mm and 300 mm for light, medium, heavy and extra heavy pitching, respectively (see table 4). No workman or any other load shall be allowed on the grouted surface within the period of 48 h after the grout has been placed in the voids.

The grouted surface shall be cured for at least 4 d by the use of an approved curing compound or other approved means.

5.3.4 Wired pitching

Wired pitching shall be completely enclosed in wire netting, and shall be constructed in the shape of rectangular blocks as shown on the drawings or as directed. The lower net shall have approved wire ties fastened at 0,6 m centres and it shall be of such a size that when the pitching is laid on it, there is sufficient netting at the sides and ends to fold up for about half the depth of the pitching.

The pitching shall be laid on the lower net as specified in 5.3.2. After the pitching has been laid, an upper net similar to the lower net but without ties shall be drawn tightly over the pitching and so fastened to the ties of the lower net that the edges of the upper and lower nets are in contact with each other and no stone is able to fall out of the netting. Where a footing trench is provided in terms of 5.3.1, both upper and lower nets shall extend to the full depth of the footing trench.

5.3.5 Grouted wired pitching

Except that the grout shall cover the upper wire net, grouted wired pitching shall be constructed as specified in 5.3.3 and 5.3.4.

6 Tolerances

The materials and the finish of the work shall be to Degree of Accuracy II and the permissible deviations (PD) (see clause 6 of SABS 1200 A, SABS 1200 AA or SABS 1200 AD, as applicable) shall be within the limits given below for Degree of Accuracy II:

1	2	3	4
Item	**Permissible deviation**		
	Degree of accuracy		
	III	**II**	**I**
	mm	mm	mm
a) **Gabion walls and revetments**			
1) **Position of top edge of terrace**[1] PD from designated position of any point, measured from nearest grid line	±450	±300	±150
2) **Alignment of top edge of terrace**[1] PD from a line joining any two points 30 m apart on top exposed edge of each course of gabion boxes or mattresses	±200	±100	± 50
3) **Finished levels** PD from designated levels	±150	± 50	± 50
4) **Slopes to top surfaces** PD from direction of slope	nil	nil	nil
	%	%	%
PD from rate of fall:			
1 in 100 to 1 in 300	20	20	5
1 in 400 and flatter	10	5	2
	mm	mm	mm
b) **Surface of pitching** Local irregularities in the surface of pitching from designated lines			
1) Light pitching	*2)	75	*2)
2) Medium pitching	*2)	100	*2)
3) Heavy pitching	*2)	125	*2)
4) Extra heavy pitching	*2)	150	*2)

1) Subject to the breakline between intersecting slopes being acceptably straight or curved, as applicable.
2) As stated in the project specification, if required.

7 Tests

7.1 Taking and testing of samples

The Contractor shall carry out sufficient tests to satisfy himself as to the consistency of materials used for and placed in gabion cages and used for pitching.

7.2 Material or standard of finish not to specification

The Engineer may carry out such check tests as he deems necessary, at any depth or on any layer, and the results of such tests will be made available to the Contractor. Where the Engineer's tests reveal that the material used does not comply with the applicable requirements of the specification, or that the specified standard of finish has not been attained, the Contractor shall so rectify the work that the material complies with the said requirements and the specified standard of finish is attained.

7.3 Weathering test

A crushed sample taken from the stone to be used shall be tested as follows:

a) At least 500 g of stone passing through a square mesh sieve of nominal aperture size 19 mm and retained on a square mesh sieve of nominal aperture size 13,2 mm shall be dried to constant mass *(M1)* in an oven that is maintained at 105 $\pm$ 2 °C.

b) The dried stone shall be immersed in a saturated Glauber salt solution in a porcelain dish for 8 h, after which it shall be carefully separated from the solution by decantation and placed in the oven (see (a) above) for 14 h.

c) The stone shall then be allowed to cool at room temperature for 2 h.

d) The procedure given in (b) and (c) above shall be repeated for a total of 10 cycles, after which the stone shall be thoroughly washed with hot water, dried to constant mass as in (a) above, screened on a square mesh sieve of nominal aperture size 1,70 mm, and the material retained on this sieve shall be weighed *(M2)*.

The percentage weathering loss calculated from the formula $(100(M1 - M2))/M1$ shall not exceed 5 %.

7.4 Durability test

In addition to being tested in accordance with 7.3, stones from doleritic source material shall be subjected to a durability test as follows:

a) From a crushed sample taken from the stones to be used, 100 stones passing through a sieve of nominal aperture size 53,0 mm and retained on a sieve of nominal aperture size 26,5 mm shall be taken at random.

b) The stones shall be washed to remove all adhering material.

c) The stones shall then be dried for 4 h in a well-ventilated oven maintained at 105 °C $\pm$ 5 °C and, after they have cooled to room temperature, they shall be weighed.

d) The procedure given in (c) above shall be repeated until the decrease in mass after each of two successive drying periods of 4 h does not exceed 0,1 % of the total mass.

e) The 100 dried stones shall then be placed in a suitable container and covered with ethylene glycol maintained at a temperature of 18 °C to 25 °C, for 20 d.

The number of stones that have broken near the middle shall be determined and this number shall not exceed 5.

7.5 Gabion cages after installation, filling and lacing

The lacing of the edges of adjoining cages, of diaphragms to side panels, and of lids (after filling) shall be tested by the application, in an approved manner, of a tensile force in the relevant plane and the force required to separate the edges, the diaphragms and the lids shall, in each case, be at least 1,5 kN/m.

8 Measurement and payment

8.1 Principles

The principles and computation of quantities set out in 8.1 and 8.2 of SABS 1200 D or SABS 1200 DA, as relevant, shall apply to excavations.

8.2 Scheduled items

8.2.1 Surface preparation for bedding of gabions

a) Cavities filled with approved excavated material or rock ..... Unit: m^2

b) Cavities filled with grade 15 concrete (provisional) ..... Unit: m^2

The area measured for payment will be calculated from the neat dimensions shown on the drawings of wall foundations, revetments or aprons, as applicable.

The rates for (a) and (b) above shall cover the cost of material, plant and labour for levelling, filling of cavities, if any, with rock or concrete, as applicable (see 5.2.1), and compacting the founding surface ready to receive gabion cages for retaining walls, aprons and revetments.

8.2.2 Gabions ..... Unit: m^3

Separate items will be scheduled for gabions of galvanized wire and for gabions of PVC-coated galvanized wire and for each size of box or mattress, each mesh size, and each diaphragm spacing.

The volume will be calculated from the dimensions of the gabions as shown on the drawings or as ordered, irrespective of any deformation or bulging of gabions as constructed.

The rate shall cover the cost of the supply of stones, wire mesh cages, binders and connectors, and the cost of loading, transporting, offloading, assembly and filling of the cages, and completion of the construction of the gabions.

8.2.3 Extra-over 8.2.2 for packing selected stone for exposed face

(Degree of accuracy on finished faces and edges stated) ..... *Unit: m^2*

Where packing selected stone for an exposed face is scheduled or ordered, the area measured will be that specified as having the special appearance.

The rate shall cover the additional cost of selecting and placing selected stone in the manner specified in the project specification.

8.2.4 Geotextile (or geomembrane) ..... Unit: m^2

The area measured will be that of the gabion face scheduled or ordered to be backed with geotextile (or geomembrane).

The rate shall cover the cost of supplying geotextile (or geomembrane), cutting, waste, placing, joining, overlapping and fastening the geotextile (or geomembrane) in position.

8.2.5 Pitching ..... Unit: m^2

Separate items will be scheduled for each type of pitching and slope. The area measured will be that of the finished surface.

The rate shall cover the cost of trimming and preparing slopes and excavated surfaces, excavating footing trenches to a vertical depth not exceeding 1 m and backfilling and compacting, supplying, hauling and placing all stone, grout and wire netting, and the complete construction of the pitching as specified in 5.3.1 to 5.3.5, as applicable.

NOTES

1 Where the footing trench is ordered to be excavated to a depth exceeding 1 m vertically below natural ground, the extra excavation over that required for a 1 m vertical depth will be measured for payment in terms of 8.3.3 of SABS 1200 D or 8.3.2 of SABS 1200 DA, as applicable, which payment shall also cover the cost of excavating, backfilling and compacting the extra depth. In such a case, the extra pitching will be measured for payment in terms of 8.2.5 above.

2 Where the form of protection for pitching toes or edges is other than a footing trench, payment will be made separately at suitable schedule rates or at an agreed price or as daywork, as approved.

8.2.6 Backing for pitching (see 5.3.1) (provisional) ..... Unit: m^2

The area measured will be that ordered to be backed.

The unit rate shall cover the cost of supply, handling and placing of the backing.

8.2.7 Weepholes ..... Unit: No.

The rate shall cover the cost of supplying materials and constructing weepholes to specified details.

Appendix A
Applicable standards

Reference is made to the applicable issues (see 2.2 of SABS 1200 A, SABS 1200 AA, or SABS 1200 AD, as applicable) of the following standards:

SABS 952	*Polyethylene sheet.*
SABS 1083	*Aggregates from natural sources.*
SABS 1580	*Steel wire gabion cages.*
SABS 1200 A	*Civil engineering construction : General.*
SABS 1200 AA	*Civil engineering construction : General (small works).*
SABS 1200 AD	*Civil engineering construction : General (dams).*
SABS 1200 C	*Civil engineering construction : Site clearance.*
SABS 1200 D	*Civil engineering construction : Earthworks.*
SABS 1200 DA	*Civil engineering construction : Earthworks (small works).*
SABS 1200 DE	*Civil engineering construction : Small earth dams.*
SABS 1200 DM	*Civil engineering construction : Earthworks (roads, subgrade).*
SABS 1200 DN	*Civil engineering construction : Earthworks (railway sidings).*
SABS 1200 G	*Civil engineering construction : Concrete (structural).*
SABS 1200 GA	*Civil engineering construction : Concrete (small works).*
SABS ENV 197	*Cement - composition, specifications and conformity criteria.*

ISBN 0-626-10826-8

WESTERN CAPE DEPARTMENT OF AGRICULTURE
SPECIFICATION FOR CONCRETE ABRASION RESISTANCE COATING FOR ROCK FILLED WIRE BASKETS

Rev 1 June 2018

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Contents

i. Acknowledgements

Errol Jenkinson is acknowledged for his invaluable comments as he has many years of experience with gabion construction.

The Western Cape Department of Agriculture LandCare section (especially Hannes Muller and Christie Lourens) are acknowledged for their dedication to river rehabilitation projects and input to this specification.

ii. Terminology

Gabion:	A wire basket that gets filled with rock with the purpose of forming a wall or a part of a structure.
Reno mattress:	A relatively flat wire basket that gets filled with rock with the purpose of forming a surface erosion protection layer.
Basket:	A general term referring to both gabions and Reno Mattresses.
Lacing wire / binding wire:	Wire provided by the basket manufacturer for closing baskets, and joining them together. This wire may have a plain heavy Galfan coating or a Galfan coating covered with pvc, depending on the protection specified for the baskets.
Diaphragm:	A piece of gabion mesh fitted vertically inside a basket that holds the top and bottom face of the basket together at a specified distance, and limits to movement of the rocks filling the basket when the unit is submerged under fast flowing water.
Engineer:	The person appointed to represent the Department of Agriculture's technical interests in the project (ie not the Engineer in terms of the GCC)
Contractor:	The person who has tendered for and been appointed to carry out the construction on behalf of the Department of Agriculture

iii. Background

This specification has been compiled to facilitate the execution of river rehabilitation projects funded by National Disaster Relief funding as well as other Provincial sources. Shortcomings in the SANS specification has necessitated the production of a specification to clarify misunderstandings on site.

1. Reference to other specifications

The following are also specifications for rock filled wire basket work. Information has been drawn from them, but where there is conflict, for work done for the Western Cape Department of Agriculture this specification takes precedence over all other specifications.

1.1. Western Cape Department of Agriculture

Specification for River Erosion Stabilization Works Rev 1 April 2016 or as updated.
Specification for Rock Filled Wire Baskets For Constructing Hydraulic Structures Rev 3 June 2016 or as updated.

1.2. SANS

SABS 1200DK 1996 Gabion construction
SABS 1580 Gabion material

1.3. Maccaferri

Maccaferri Assembly Manual: Gabion Structures: ZAF/Gabion/Assembly: Eng - Rev 04, Aug 2012
(NB do not use the Maccaferri Assembly Manual Rev 03, 2007)
Maccaferri Product installation guide: Gabions : ZAF/IS/GAB: Eng - Rev 06, Nov 2010
Maccaferri Product installation guide: Reno Mattresses : ZAF/IS/RM: Eng - Rev 06, Nov 2010

2. Abrasion and other protective coatings

2.1. All gabion baskets and mattresses shall be Galfan coated, as well as some will have an additional PVC coating as specified on the construction drawings. The contractor shall take care not to damage these coatings during construction (especially when packing rocks into the baskets – should the Engineer be of the opinion that these coatings have been excessively damaged, the affected baskets shall be removed and replaced at the contactor's cost.

2.2. The coarse aggregate for concrete abrasion protection shall be a nominal 13 mm crushed stone.

2.3. Concrete for abrasion protection to gabion wires shall have a minimum 30 day strength of 30 MPa. It is the responsibility of the contractor to provide the Engineer with material samples, a design mix for those materials performed by an materials laboratory accredited for this purpose by the Engineer, and a specification for the adequate mixing, transporting, and placing of the concrete from the same materials laboratory so as to obtain an acceptable finish and the design strength.

2.4. Fresh concrete must be cured by covering it with a plastic sheet within 2 hours of casting. This sheet must remain in position for a minimum of seven days. The sheet must be large enough, and be secured into position, such that the fresh concrete does not get dried out by the sun or wind while covered with

plastic. The mixing of concrete on site may not begin if sufficient plastic is not on site to cover the cast concrete.

2.5. Should concrete not be mixed, transported, and placed according to the specification provided by the materials laboratory, or cured in terms of this specification, in the opinion of the Engineer, the Engineer shall issue an instruction for the immediate removal of the concrete in question from the structure at the Contractor's cost.

2.6. Concrete making materials must be stored in such a way that the desired concrete strength may be achieved. Pockets of cement must be stored dry and in such a way that they cannot absorb moisture from the ground, sand for making concrete must be kept covered by a waterproof membrane to control the moisture content.

2.7. Concrete must be cast within two hours of initial mixing. No re-mixing and use of surplus concrete from the previous day will be allowed.

2.8. The transporting of concrete in wheel barrows or other vehicles over concrete that is less than 2 weeks old is prohibited.

2.9. The mixing of concrete on top of the structure is prohibited.

2.10. The mixing of concrete by hand is prohibited, unless the prior approval of the Engineer is obtained (this will only be arranged for small quantities).

2.11. Where concrete pads are detailed to provide abrasion resistance to gabion wires, they will be in total 100 mm thick, with 40 mm below the gabion wire and 60 mm above the gabion wire. The contractor must take care when packing the gabion that the surface of the gabion is uniform for this purpose. Shutters for casting concrete pads must be cleaned after every use, and then treated with a suitable release agent so that the concrete does not get damaged when the shutter is removed.

2.12. Concrete pads must be cast in one action and without cold joints.

2.13. Should concrete pads be cast with insufficient thickness or depth below the gabion wires, the Engineer may direct the Contractor to remove the affected pads. If the wires of the baskets on which the defective pads were cast are damaged, the Engineer may direct that the basket be replaced as well.

2.14. Figure 1 shows a well-constructed abrasion resistance pad.

Figure 1 Well-constructed concrete abrasion resistance pad

2.15. Where a continuous concrete skin is detailed to provide abrasion resistance to gabion wires, 40 mm of the concrete thickness shall be below the gabion wire and the rest above. The contractor must take care when packing the gabion that the surface of the gabion is uniform for this purpose. Should additional steel reinforcing be detailed for the concrete, it the responsibility of the contractor to provide the Engineer with an acceptable method statement as to how the reinforcing will be fixed in the desired position and kept there while the concrete is being cast. If the construction drawings do not specify the position of construction joints, it is the responsibility of the contractor to provide the Engineer with an acceptable method statement as to where and how construction joints will be made. No other construction joints or cold joints will be acceptable.

3. Tolerances

3.1. The permissible deviation of the concrete layer dimensions and position is as follows:-

3.1.1. Localised thin spot in concrete layer (due to high rocks in basket below) up to 10 mm less than specified.

3.1.2. Straightness of an exposed edge (in the horizontal plane) of a layer of solid concrete (as found on weirs) – not more than 10 mm horizontal deviation over any 3m length as measured with a straight edge.

3.1.3. The deviation of the surface of a solid layer of concrete from the design level +- 5mm.

WESTERN CAPE DEPARTMENT OF AGRICULTURE
SPECIFICATION FOR ROCK FILLED WIRE BASKETS FOR CONSTRUCTING HYDRAULIC STRUCTURES

Rev 5 June 2018

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Contents

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Lacing wire / binding wire:	Wire provided by the basket manufacturer for closing baskets, and joining them together. This wire may have a plain heavy Galfan

	coating or a Galfan coating covered with pvc, depending on the protection specified for the baskets.
Diaphragm:	A piece of gabion mesh fitted vertically inside a basket that holds the top and bottom face of the basket together at a specified distance, and limits to movement of the rocks filling the basket when the unit is submerged under fast flowing water.
Engineer:	The person appointed to represent the Department of Agriculture's technical interests in the project (ie not the Engineer in terms of the GCC)
Contractor:	The person who has tendered for and been appointed to carry out the construction on behalf of the Department of Agriculture

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Specification for Concrete Abrasion Resistance Coating for Gabion Baskets Rev 0 June 2016 or as amended.

1.2. SANS

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SABS 1580 Gabion material

1.3. Maccaferri

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Maccaferri Product installation guide: Reno Mattresses : ZAF/IS/RM: Eng - Rev 06, Nov 2010

2. Foundation preparation

2.1. The foundation on which gabion baskets or Reno mattresses are to be placed shall be compacted, level and graded to elevations as shown on the project construction drawings and free of surface irregularities, loose material and vegetation in accordance with the project specifications.

2.2. Unnecessary disturbance of in-situ compacted soil under or beside a structure is to be avoided to limit the possibility of flow paths forming in the soil around the structure.

2.3. As far as possible, gabions and Reno mattresses are only to be constructed on undisturbed soil or properly compacted and suitable fill.

2.4. Where piping underneath a structure is a threat, the Engineer will direct that unsuitable foundation material is removed and replaced with suitable fill material, well compacted, and fully enclosed within a geotextile envelope.

2.5. The de-watering of the excavation around a structure being packed must be either by drainage ditches, or by means of pumps made for the purpose. The scooping of water out of the excavation with the bucket of an excavator disturbs the foundation of the structure and will not be permitted.

3. Materials

3.1. Stone

3.1.1. Rocks for filling gabions and Reno mattresses must be hard and preferably angular so that a denser pack may be achieved, but if none other is available round river stone may be used.

3.1.2. The rocks must be of such a quality that they shall not disintegrate on exposure to water or weathering during the expected life of the structure.

3.1.3. The nominal size of the stone must be such that it does not pass through the wire mesh of the basket irrespective of the stone's orientation. The minimum dimension of rocks would then be from 100 mm to 200mm.

3.2. Granular fill

3.2.1. Granular fill (for compacted fill in geotextile envelope) shall be a granular soil with particle size between 0,5 mm and 25 mm, free of organic material, unless prior approval for another material is obtained from the Engineer.

3.3. Gabion baskets

3.3.1. Gabion baskets must comply with SANS 1580 Gabion material for plain galvanised, as well as galvanised and pvc coated wire. Galfan (95% zinc and 5% aluminium) must be used in place of the plain zinc coating in SANS 1580.

3.4. Reno mattresses

3.4.1. Reno mattresses must comply with SANS 1580 Gabion material for plain galvanised, as well as galvanised and pvc coated wire. Galfan (95% zinc and 5% aluminium) must be used in place of the plain zinc coating in SANS 1580.

3.5. Gabion mesh

3.5.1. Gabion mesh (supplied in rolls) must comply with SANS 1580 Gabion material for plain galvanised, as well as galvanised and pvc coated wire. Galfan (95% zinc and 5% aluminium) must be used in place of the plain zinc coating in SANS 1580.

3.6. Diaphragms

3.6.1. Enough diaphragms shall be supplied such that the length of void to be filled with rock down the length of the basket is no more than 1 meter (with the exception of the 6x3 Reno mattress which has 2m long diaphragms at 1 meter spacing, but this basket is not normally recommended for high flow velocity applications).

3.6.2. The size and protective coating of the wire used to make the diaphragm mesh shall be the same as that of the basket for which it is intended.

3.6.3. The size of the diaphragm shall be such that it is the same as the nominal cross section of the basket for which it it provided (for instance 1m x 1m for a gabion basket of size 4x1x1).

3.6.4. The diaphragm will be supplied framed on all four sides with selvedge wire.

3.7. Lacing wire

3.7.1. Lacing wire is described in SANS 1580. It is softer than that of the basket wire. The protective coating of the lacing wire shall be the same standard as that of the gabion unit for which it is intended (or if it is connecting two gabion units, the higher standard of the two).

3.7.2. The lacing wire must be provided by the supplier of the gabion baskets, as lacing wire (unless approved by the Engineer for this purpose).

3.7.3. The lacing wire may not be of an inferior protective coating than the highest standard of the baskets being fastened (the use of lightly galvanised lacing wire obtainable at hardware stores is specifically prohibited).

3.7.4. It is the Contractor's responsibility to understand how much lacing wire is required to construct the work according to the Department of Agriculture's specification, and to provide for it in the tendered price. No claims for extra payment for shortfalls in lacing wire supplied by the gabion supplier, will be entertained by the Department unless it can be proven that a quantity of lacing wire above that already specified in this specification has been required by the Engineer.

3.8. Geotextile

3.8.1. Bidim A4 (or similar approved by the Engineer). It is important that a product that is similar has the same tensile strength (14kN/m) as well as permeability (100 l/s/m^2 @ 50 mm head).

3.9. Hyperliner

3.9.1. A hyperliner is specified on the drawings to create an impermeable cut-off to prevent water seeping past a weir should this be deemed necessary. In this case the hyperliner shall be a 375μm Hyperlastic Orange ex Gundle Plastics (or similar approved by the Engineer) bearing the SABS 952-1 2011 Type A mark.

4. Unpacking and preparing wire baskets for construction

4.1. Assembly of wire baskets

4.1.1. Gabions and Reno mattresses are manufactured with all components (except the diaphragm, and Reno mattress lids) mechanically connected in the factory. The folded units must be taken out of their bundles and unfolded in the site fabrication yard on a hard flat surface where the original shape must be restored. Care must be taken to completely remove the folds in the wires made

when the baskets are packed at the factory. Front, back and end panels must be lifted to a vertical position to form an open box.

4.1.2. Panels must be initially fastened together with the projecting heavy gauge selvedge wire, by firmly wrapping the selvedge wire around the selvedge wire of the intersecting panel or back panel. The joints between all the panels of the box (except the lid at this stage) must then be securely joined with lacing wire (as specified in section 0). The diaphragms (and where necessary end-panels) must be correctly positioned and likewise laced into position on the front, back and bottom face of the basket.

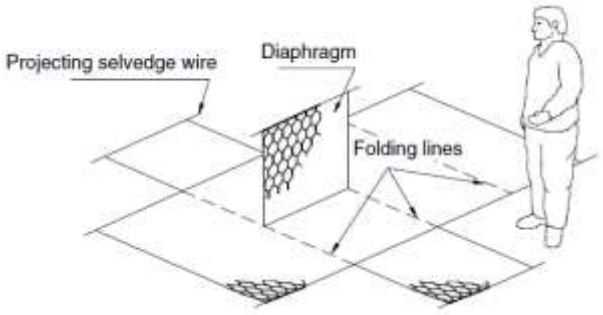

Figure 1 The unfolding of a shipped gabion basket (Maccaferri)

4.1.3. All baskets are to be unfolded and laced in the site fabrication yard prior to the basket being carried to its final position at the structure. The implication of this is that a lacing wire in addition to that mentioned in section 4.1.2 must be used to lace baskets together.

4.2. Control of the structure position

4.2.1. Weirs and groynes are linear structures, and apart from being in the planned position, it is important that the exposed edges of these structures are straight and level. To ensure this a length of wire must be stretched tight along the centreline of the structure prior to construction, to guide the placement of the empty baskets horizontally as well as vertically (if this technique is not used it is the responsibility of the contractor to provide the Engineer with an acceptable method statement detailing how the structure will be maintained in position and on level).

4.2.2. Tolerances for the positioning of the finalized structure are given in section 12 .

4.3. Fitting wire baskets to the structure

4.3.1. The pre-assembled wire baskets shall be placed into position empty, and laced (as specified in section 0) to adjacent units to form the structure.

4.3.2. The empty gabions that have been laced together must be stretched by fastening one end to the existing structure and pulling the other end with a Tirfor or similar suitable wire rope winch.

4.3.3. Figure 2 below shows how consecutive layers of gabions in a structure are joined then filled in lifts to limit the deformation of the diaphragms by the weight of the stone (refer to 8.5).

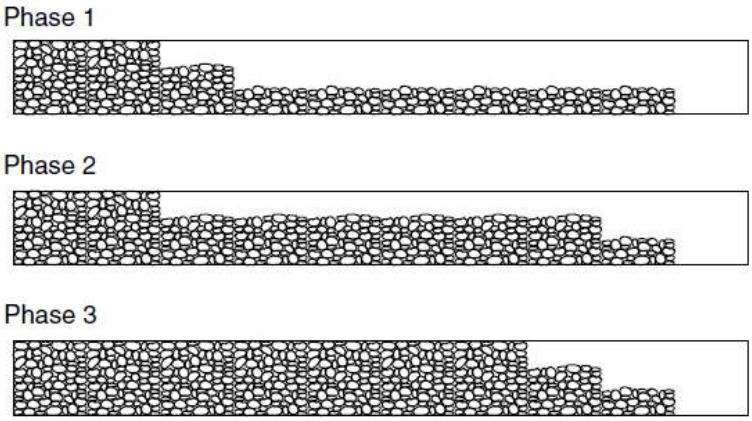

Figure 2 The filling sequence of gabions in lifts to limit diaphragm deformation (Maccaferri)

4.4. Placing Reno mattresses

4.4.1. When the 6x2 Reno mattresses are specified, they must be placed with the diaphragm perpendicular to the water flow direction (to limit the migration of the fill rocks during floods - when 3x1 Reno mattresses are specified the compartments created by the diaphragms are square and this is not a problem).

5. Lacing of wire baskets

5.1. Lacing wire to be used

5.1.1. The lacing wire to be used is described in section 3.7 .

5.2. Joints to be made

5.2.1. After being pre-assembled, gabions and/or Reno mattresses shall be placed in their proper location and securely attached to the adjacent ones, as well as those directly below. For structural integrity all adjoining empty units shall be connected by means of lacing wire along all edges of their contact surfaces, in order to form a continuously connected, monolithic structural unit (ie the top, bottom and both sides of the contact area get laced, for gabion baskets as well as mattresses). The joint between different layers of a structure must only be stitched on the outside (exposed) edge.

5.3. Spacing of lacing stitches

5.3.1. Lacing wires shall be secured around the selvedge wire or heavier edge wire, where present, by looping and twisting the lacing wire around itself. Proceed tying with alternating double and single loops (each spaced 100 mm apart). Figure 3 shows the required spacing for gabion lacing stitches.

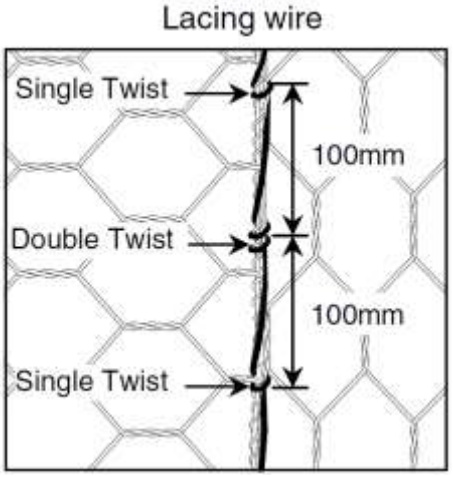

Figure 3 The required spacing of gabion lacing stitches (Maccaferri)

5.4. Special care

5.4.1. When lacing baskets, special care must be taken to not damage the protective coating on the lacing wire as well as that on the basket. Heavy gloves and rubber mallets can be used in place of pliers for all functions except the cutting of wire. Baskets with the coating excessively damaged as deemed by the Engineer will have to be unpacked and replaced at the Contractors cost (see also 8.14).

5.5. Diaphragms

5.5.1. Diaphragms shall be stitched tightly to the lid and the base of the gabion with stitches specified in 5.3.1.

5.5.2. Care must be taken when packing baskets that the diaphragm can be pulled tightly against the lid of the basket and fastened there with lacing wire.

5.6. Dividing of baskets on site

5.6.1. The dividing of baskets on site to produce smaller baskets will only be permitted if done with the prior knowledge of the Engineer so that the Engineer can have the opportunity to arrange to inspect the stitching of the closure of the cut basket.

6. Setting out the works

6.1. The Department of Agriculture shall supply at least 2 co-ordinated permanent beacons from which the works shall be set out.

6.2. The contractor shall take necessary steps to ensure the protection of the Department of Agriculture's permanent beacons from disturbance by construction equipment.

6.3. The contractor is responsible for the setting out of the works and ensuring that the structures are in the specified position and level.

6.4. The Contractor must inform the Engineer when the setting out of the works is complete so that the Engineer can check the setting out if deemed necessary.

7. Geotextile between wire baskets and the soil

7.1. All interfaces between the soil and gabions as well as Reno mattresses shall have a geotextile as specified on the project construction drawings, to prevent the migration of soil through the structure. Only on the instruction of the Engineer may this be omitted.

7.2. All joints between sheets of geotextile shall be constructed so that they do not leak soil particles.

7.2.1. In joints between geotextile sheets which are placed between a hydraulic structure and soil or soil backfill, a simple overlap of a minimum of 300 mm is adequate. Care must be taken when placing and compacting the fill material that the geotextile is not moved lessening the overlap.

7.2.2. Where pieces of geotextile are joined by overlapping, care must be taken to place the upstream sheet above the downstream sheet, so that the moving water does not flow into the joint and to between the geotextile and the soil.

7.2.3. Where a geotextile is used to enclose compacted fill in cells between gabion baskets, see Section 9.

8. Filling of wire baskets

8.1. Rock used for the filling of baskets must conform to section 3.1 .

8.2. To obtain a flat exterior vertical surface, gabions must be packed with the basket suspended in a vertical steel tube tensioning frame constructed for this purpose (see the Maccaferri manuals).

8.3. When a rock is placed in the basket, it must be rotated manually and placed such that the volume of voids between rocks in the basket is a minimum (alternatively the density of the packed structure must be a maximum), as well as reducing the risk of damaging the coating on the wire. The tipping of stone into the basket direct from earthmoving machines, or any other dropping of rocks into a basket will not be allowed.

8.4. Care shall be taken to not damage the pvc or other protective coating on the basket wires or lacing wire while placing the rocks (refer to 5.4.1 and 8.14) and during other processes such as the stockpiling of stones for packing, backfilling etc.

8.5. Rock must be placed in gabions in layer thicknesses appropriate to the position of the internal cross bracing. For gabion units, rock shall be placed in 330 mm lifts before the cross bracing is installed directly above the rock.

8.6. To limit the distortion of diaphragms and gabion end walls, the rock fill in one gabion cell shall never exceed more than 330 mm higher than that in the adjoining gabion cell (refer also to 4.3.3).

8.7. Stiffeners or internal cross bracing shall be installed in 1m high gabion units connecting the exposed vertical face and the face behind it to reduce the bulging of the face. Two stiffeners shall be provided at the vertical third points. Lacing wire appropriate for corrosion protection at the given level of the structure shall be used to form the bracing. Figure 4 shows the position of these stiffeners.

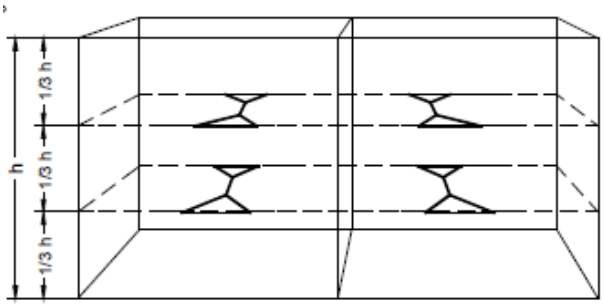

Figure 4 Horizontal cross bracing (or stiffeners) to limit the bulging of the exposed gabion face (Maccaferri)

8.8. Vertical stiffeners must be provided between Reno mattress bottom and top faces to limit the migration of stone in the basket during floods. Four evenly spaced tie wires are required per square meter (the wire must be the same wire supplied by the gabion manufacturer for closing the gabions).

8.9. Rock placed against exposed vertical faces shall be hand placed to create a uniform flat surface.

8.10. When more than 1 layer of gabion units are installed vertically, the units shall be overfilled by not more than 25 mm to allow for natural settlement.

8.11. The top surface of the packed rock shall be levelled smooth by selecting appropriately shaped rocks.

8.12. Care must be taken that the diaphragms must be easily accessible for connecting to the gabion lid. Where sections 8.6 and 8.10 have not been adhered to and a "spider web" of lacing wire is required to join the lid to the diaphragm, the gabion must be unpacked and repacked properly so that the lid may be fastened in accordance with section 5.5 .

8.13. To prevent the structure from sagging when some re-orientation of the fill rock takes place during floods, gabions and Reno mattresses have to be slightly over filled (refer to 8.10) so that the lid has to be stretched to make it close.

8.14. All gabion baskets and mattresses shall be Galfan coated, as well as some will have an additional PVC coating as specified on the construction drawings. The contractor shall take care not to damage these coatings during construction (especially when packing rocks into the baskets – should the Engineer be of the opinion that these coatings have been excessively damaged, the affected baskets shall be removed and replaced at the contactor's cost.

9. Compacted granular fill in geotextile envelope

9.1. The fill material is defined in section 3.2 .

9.2. Before a cellular fill may be constructed, the Contractor must prove the adequacy of the chosen compaction technique and equipment for the fill material, and the confined area where compaction is to take place, to the satisfaction of the Engineer.

9.3. A sheet of gabion mesh must securely link the gabion walls which form the pocket into which the compacted granular fill is placed, above and below the compacted granular fill. The mesh must be secured to the baskets in the manner set out in Section 5 of this specification. Where a capping layer of gabion baskets or mattress is specified over the top of the uppermost layer of compacted granular fill, this gabion mesh is not required. This gabion mesh shall be Galfan and PVC coated.

9.4. A Bidim A4 (or similar geotextile approved by the Engineer) shall be used to construct the envelope.

Figure 5 A stage in the construction of a compacted granular fill for a weir

9.5. Sheets of geotextile used to form the envelope shall be joined together in such a way that the granular fill will not be able to leak out of the envelope even when a mild deformation of the structure takes place (Figure 6 shows an example of the stitching required). To do this the following shall be adhered to:-

9.5.1. Geotextile sheets shall be joined by overlapping 150 mm from each sheet and rolling up the overlap.

9.5.2. The rolled overlap shall be stitched with loops of lacing wire the same used for connecting gabion baskets to the level of the joint, with the stitches enclosing the rolled overlap every 100 mm.

9.5.3. The ends of the geotextile envelope will be stitched closed as described in section 9.5.2 once the filling has been completed.

9.5.4. Care must be taken during construction not to damage the geotextile and cause perforations.

Figure 6 The joining of geotextile sheets by rolling and stitching with suitable wire

9.6. The geotextile wrapping the granular fill is not to be left in a position exposed to UV radiation. For groyne structures, the compartment formed for the granular fill by the lower gabion baskets is 1.8 meters wide. The capping layer above the topmost layer with granular fill is 2.0 meters wide, and must be placed centrally over the granular fill so that it is overlapped nominally 100 mm on each side, covering the geotextile. Should the geotextile fill wrapping still be visible from the outside of the structure, the Engineer may order that a concrete fillet be placed to cover the exposed geotextile.

10. Backfilling of structures

10.1. After the construction of the structures, the area excavated for the construction of the structures shall be backfilled in compacted layers to ensure the backfill is not more easily eroded by flowing water than the adjacent naturally compacted soil.

10.2. The backfilling of structures may only start once the Engineer has checked and approved the quality and quantity of the packed gabions.

10.3. The specification "Western Cape Department of Agriculture: Specification for River Erosion Stabilization Works" details the levels to which backfill must be taken in various circumstances.

11. Re-packing of wire baskets

11.1. Gabion baskets may only be re-used once they have been un-packed and inspected for damage to the protective coating on the wire by the Engineer. Should the Engineer be satisfied that damage to the wire is not substantial, the gabion basket may be re-used, otherwise it must be replaced with a new one (refer to 5.4.1).

12. Tolerances

12.1. The permissible deviation of the bottom surface of the lowest layer in a gabion in a structure is as follows:-

12.1.1. Foundation levels +-100mm

12.1.2. Horizontal alignment +- 50mm

12.2. The permissible deviation of the top surface of a gabion structure is as follows:-

12.2.1. Finished levels +-50mm

12.2.2. Horizontal alignment +- 50mm

Please note that for structures several layers of gabion baskets high, it may be necessary to under-fill the layer below the top layer to correct the progressive creep of levels caused by the overfilling of baskets below in order to get the lids to fit tightly. In this case the under-filled basket's surplus sides must be folded flat and so that the lid can be closed tightly.

12.3. The tolerance on the horizontal as well as vertical position of individual layers of gabions is not cumulative, but referenced to the level of the gabions as given on the construction drawings.

12.4. In addition to the requirements of 12.1 and 12.2, the exposed edges of completed gabion structures must not deviate by more than 40mm from a 3 meter long straight edge placed anywhere along the edge of the structure (measured to the edge of the gabion basket and not the rock fill). Note that the concrete capping to weirs has a much stricter tolerance (see "*Western Cape Department of Agriculture Specification For Concrete Abrasion Coating For Rock Filled Baskets*").

WESTERN CAPE DEPARTMENT OF AGRICULTURE
GENERAL SPECIFICATION FOR RIVER REHABILITATION WORKS

Rev 1 April 2016

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i. Acknowledgements

The Western Cape Department of Agriculture LandCare section (especially Hannes Muller and Christie Lourens) are acknowledged for their dedication to river rehabilitation projects and input to this specification.

ii. Terminology

Engineer:	The person appointed to represent the Department of Agriculture's technical interests in the project
Contractor:	The person who has tendered for and been appointed to carry out the construction on behalf of the Department of Agriculture
ECO:	The "Environmental Control Officer" appointed in terms of the NEMA regulations to oversee environmental issues on the site.

iii. Background

This specification has been compiled to facilitate the execution of river rehabilitation projects funded by National Disaster Relief funding as well as other Provincial sources. Shortcomings in the SANS specification has necessitated the production of a specification to clarify misunderstandings on site.

Contents

1. Reference to other specifications

The following are also specifications relating to rehabilitation work in rivers. Information has been drawn from them, but where there is conflict, for work done for the Western Cape Department of Agriculture this specification takes precedence over all other specifications.

1.1. Western Cape Department of Agriculture

Specification for rock filled wire baskets for constructing hydraulic structures.
Specification for concrete abrasion resistance coating for rock filled wire baskets.

1.2. SANS

SABS 1200DK 1996 Gabion construction
SABS 1580 Gabion material

1.3. Maccaferri

Maccaferri Assembly Manual: Gabion Structures: ZAF/Gabion/Assembly: Eng - Rev 04, Aug 2012
(NB do not use the Maccaferri Assembly Manual Rev 03, 2007)
Maccaferri Product installation guide: Gabions : ZAF/IS/GAB: Eng - Rev 06, Nov 2010
Maccaferri Product installation guide: Reno Mattresses : ZAF/IS/RM: Eng - Rev 06, Nov 2010

2. Planning of the sequence of the works

2.1. Before work may proceed the contractor must provide an acceptable method statement to the Engineer describing how the proposed work in the river will progress. This method statement must cover the following:-

2.1.1. How the site will be de-watered sufficiently to enable the work to be executed

2.1.2. The sequencing of the construction of structure(s) and of earthwork berm(s) and the time required for the construction of each item.

3. Site office, materials storage and concrete batching

3.1. Before site handover to the Contractor, the Contractor must agree to the location of the site office, materials storage area(s) and concrete batching area(s) with the Engineer, ECO and landowner.

4. Setting out of the works

4.1. The Department of Agriculture will provide at least 2 co-ordinated reference beacons from which the works are to be set out.

4.2. The setting out of the works and control of levels is the responsibility of the Contractor.

4.3. The Contractor must notify the Engineer once the works have been set out so that the Engineer can check the set out positions of pegs if he deems necessary.

5. Care of vegetation on the site

5.1. No disturbance of natural vegetation will be allowed unless the prior approval of the Engineer and ECO has been obtained.

5.2. Rescued natural vegetation must be stored in a manner and place agreed between the Contractor, Engineer and ECO.

5.3. The Special Provisions attached will specify which alien vegetation must be removed.

6. Making provision for managing the flow of water during construction

6.1. The Contractor is responsible for damage that occurs to the construction site and the works during floods.

6.2. The Contractor has a duty of care to minimise the risk of damage to the environment on the construction site should a flood occur.

6.3. Should a temporary drainage channel be dug by the Contractor to drain the site, a method statement in addition to the method statement in section 2.1, detailing the position, width and depth of the proposed channel is required prior to the excavation of the channel. It is the responsibility of the Contractor to ensure that the channel will handle the normal flow of the river and at least annual floods without soil erosion as judged by the Engineer. Deep, narrow channels which encourage high flow depths and velocities, and the erosion of sediment will not be accepted.

6.4. The method statement in section 6.3 must also give clear details as to how the temporary channel will be rehabilitated at the end of the project.

7. Earthworks for the finishing the final river channel and constructing the terraces between the groynes

For projects using groynes to protect river banks from lateral erosion the following applies:-

7.1. The desired final river bed where groynes protrude from a river bank, must have a uniform cross-fall as well as a uniform fall in the direction of flow. Between the groynes there must be a consolidated soil terrace at a level slightly higher than that of the adjacent river bed. To finish the landscaping of the river bed and the terrace between the groynes, the following construction sequence is required:-

7.1.1. The temporary drainage channel constructed under "drainage of site" in the bill of quantities (should it exist) must first be rehabilitated and the groyne structures backfilled to the soil level which existed prior to the start of construction.

7.1.2. Once the earthworks in section 7.1.1 has been reasonably completed, the Engineer shall issue a direction as to where and how soil must be sourced to construct the terraces between the groynes, as well as the level to which the terrace shall be constructed.

7.1.3. The top of the terraces between the groynes should only be in the order of a half meter above the river bed, except where the terraces butt up against the bank and the Engineer may issue a further instruction to slope the terrace upwards at a 1:3 slope (there are two reasons for this, firstly that the groynes protrude from the fill and can have an impact on the flowing water, and secondly that plants on the terrace are able to access sub-soil moisture).

7.1.4. The line produced by the front edge of the terrace (ie where the terrace starts to rise above the river bed level) should be 8 meters behind a line connecting the groynes at the same level (so that turbulent water flowing over the groyne does not wash the terrace away).

7.2. The payment for the landscaping of the river bed once the temporary drainage channel has been rehabilitated, and the construction of the terraces will be paid for under day-works provided for this purpose in the bill of quantities.

8. Sourcing of stone for gabion construction

8.1. The Contractor is responsible for sourcing stone for the packing of gabions.

8.2. The quality of stone for packing in wire baskets is specified in the WCDOA Specification for rock filled wire baskets for constructing hydraulic structures.