ERWAT
EXCELLENCE IN WATER CARE

CIDB 3 EP (2 EP PE)

CIDB REFERENCE NUMBER: _____

PROJECT NO: ERW202012/TNDR-001

WATERVAL WASTEWATER CARE WORKS: SUPPLY AND INSTALLATION OF 3200A RESIN ENCAPSULATED BUSBARS FOR AERATION BLOWERS PROJECT VOLUME 1 of 1

CONTRACTOR:	
ADDRESS:	
CONTACT PERSON:	
TEL NO.:	
FAX NO.:	
CELL NO.:	
E-MAIL ADDRESS:	
TENDER PRICE (INCL. VAT.):	

PREFERENCE POINTS CLAIMED: B-BBEE RATING [LEVEL____]

DISABLED [_____%] WOMEN [_____%] YOUTH [_____%] LOCALLY SITUATED [YES/NO]

ERWAT STAMP

Contractor	*Witness 1*	*Witness 2*	*Employer*	*Witness 1*	*Witness 2*

ERWAT
EXCELLENCE IN WATER CARE

PROJECT NO: ERW202012/TNDR-001

WATERVAL WASTEWATER CARE WORKS: SUPPLY AND INSTALLATION OF 3200A RESIN ENCAPSULATED BUSBARS FOR AERATION BLOWERS PROJECT

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THE TENDER

T1 – T2

Contractor	*Witness 1*	*Witness 2*	*Employer*	*Witness 1*	*Witness 2*

ERWAT
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TENDER PROCEDURES

ERWAT
EXCELLENCE IN WATER CARE

PROJECT NO: ERW202012/TNDR-001

WATERVAL WASTEWATER CARE WORKS: SUPPLY AND INSTALLATION OF 3200A RESIN ENCAPSULATED BUSBARS FOR AERATION BLOWERS PROJECT

T1.1 TENDER NOTICE AND INVITATION

TENDER NOTICE

Tenderers are hereby invited for the project as listed below in ERWAT.

Project No.	Project Description	For enquiries, please contact	Briefing Session Date	Closing Date	Tender Cost
ERW202012/TNDR-001	**WATERVAL WASTEWATER CARE WORKS: SUPPLY AND INSTALLATION OF 3200A RESIN ENCAPSULATED BUSBARS FOR AERATION BLOWERS PROJECT**	**Technical:** **Sifiso Sibiya** sifiso.sibiya@erwat.co.za **Supply chain:** **Phumzile Mdlalose** **publictenders@erwat.co.za** **Please note that all enquiries should be via electronic mail correspondence and that no telephonic enquiries will be entertained.**	**Thursday, 22 April 2021 at 11h30** At ERWAT Waterval Water Care Works, 1 Eike Road, Klip River **GPS:** **26°26′14.12″ S,** **28°06′03.55″ E**	**Friday, 14 May 2021 at 12h00**	**R250.00.** **Disclaimer:** The bidder accepts full responsibility for the download and printing of all the pages and completeness of the document, including all annexures, addendums, etc. In the event that the document submitted is not identical to that which was originally issued, ERWAT will disregard the document as a non-responsive bid.

Contractor	*Witness 1*	*Witness 2*	*Employer*	*Witness 1*	*Witness 2*

Tender documents will be made available electronically on ERWAT's website from 13 April 2021.

A compulsory clarification meeting with the representative of the employer will be held at ERWAT Waterval Water Care Works, 1 Eike Road, Klip River, on the 22nd of April 2021 @11:30, which will include inspection of the blower house immediately after the briefing meeting. Attendance registers will be completed at both clarification meeting and site inspections. Tenderers who did not attend both the compulsory clarification meeting and site inspection shall not be considered.

Completed Tenders in black ink and clearly marked **"**PROJECT NO: ERW202012/TNDR-001 **WATERVAL WASTEWATER CARE WORKS: SUPPLY AND INSTALLATION OF 3200A RESIN ENCAPSULATED BUSBARS FOR AERATION BLOWERS PROJECT"** must be placed in Bid Box 1, ERWAT Head Office, Hartebeestfontein Office Park, R25 (Bapsfontein/ Bronkhorstspruit), Kempton Park, not later than at which hour and date the TENDERS will be opened in public at ERWAT Head Office and no late, faxed, e-mailed or other form of TENDER will be accepted. TENDERS shall remain valid for a period of 120 days from closing date.

All supply chain and commercial enquiries shall be addressed to:
Phumzile Mdlalose
publictenders@erwat.co.za/ 011 929 7000.

All technical enquiries shall be addressed to:
Sifiso Sibiya
sifiso.sibiya@erwat.co.za/ 011 929 7000.

Please note that for the benefit of all tenderers any enquiry should be via electronic mail correspondence and that no telephonic enquiries will be entertained.

Tenders will be evaluated in terms of the Supply Chain Management Policy of ERWAT and the lowest Tender will not necessarily be accepted. ERWAT fully reserves the right to either accept the whole or part of any Tender, or not to consider any Tender as being suitably endorsed.

ERWAT
EXCELLENCE IN WATER CARE

PROJECT NO: ERW202012/TNDR-001

WATERVAL WASTEWATER CARE WORKS: SUPPLY AND INSTALLATION OF 3200A RESIN ENCAPSULATED BUSBARS FOR AERATION BLOWERS PROJECT

T1.2 TENDER DATA

General

The conditions of tender are the Standard Conditions of Tender as contained in Annex F of Board Notice 136 of 2015 in Government Gazette 38960 of 10 July 2015, Construction Industry Development Board (CIDB) Standard for Uniformity in Construction Procurement. See www.cidb.org.za which is reproduced without amendment or alteration for the convenience of tenderers as an Annex to this Tender Data.

The Standard Conditions of Tender make several references to the Tender Data for details that apply specifically to this tender. The Tender Data shall have precedence in the interpretation of any ambiguity or inconsistency between it and the standard Conditions of Tender. Each item of data given below is cross-referenced to the clause in the Standard Conditions of Tender to which it mainly applies.
The following variations, amendments and additions to the Standard Conditions of Tender as set out in the Tender Data below shall apply to this tender.

Clause No.	TENDER DATA
F.1.1	**The Employer is:** Ekurhuleni Water Care Company(ERWAT) Hartebeestfontein Office Park R25 (Bapsfontein/Bronkhorstspruit Road) Kempton Park
F.1.2	**The TENDER document's contents is as follows:** **Part T1 : Tender Procedures (Pink)** T1.1 Notice and invitation to Tender T1.2 Tender Data **Part T2: Returnable Documents (Pink)** T2.1 List of Returnable documents T2.2 Returnable schedules

	THE CONTRACT **Part C1: Agreements and Contract Data (Yellow)** C1.1 Form of Offer and Acceptance C1.2 Contract Data C1.3 Form of Guarantee C1.4 Occupational Health and Safety C1.5 Corporate Governance Breach Clause **Part C2: Pricing Data (Yellow)** C2.1 Pricing Instructions C2.2 Bill of Quantities **Part C3: Site Information (Green)** C3.1 Site Information **Part C4: Scope of Work (Blue)** C4.1 Standard Specifications C4.2 Project Specifications A: General C4.3 Project Specifications B: Amendments to Standard and Particular Specifications **Part C5: Additional and Particular Specifications (White)** C5.1 Additional General and Standard Employer Specifications C5.2 Particular Specifications **Part C6: Drawings (White)**
F1.3	**Interpretation** The tender data and additional requirements contained in the tender schedules that are included in the returnable documents are deemed to be part of these tender conditions.
F.1.4	**The employer's agent is:** **Name: Virtual Consulting Engineers VCE (Pty) LTD** **Capacity: Professional Engineer** **Address: PO Box 323, Groenkloof, Pretoria, 0127** **Tel: (012) 452 0444**
F.1.5.1	**Reject or Accept** The Employer may accept or reject any variation, tender offer, or alternative tender offer, and may cancel the tender process and reject all tender offers at any time before the formation of a contract. The employer shall not accept or incur any liability to a tenderer for such a cancellation and rejection, but will give written reasons for such action upon written request to do so.
F2.1	**Eligibility in respect of CIDB registration** The following tenderers who are registered with the CIDB, or are capable* of being so registered prior to the evaluation of submissions, are eligible to have their tenders evaluated: 1) Contractors who have a contractor grading designation equal to or higher than a contractor grading designation determined in accordance with the sum tendered, or a value determined in accordance with Regulation 25 (1B) or 25 (7A) of the Construction Industry Development Regulations, for a **3EP / 2 EP PE** class of construction work (Electrical Plant); and 2) Joint ventures are eligible to submit tenders provided that: a) every member of the joint venture is registered with the CIDB; and, b) the lead partner has a contractor grading designation in 3EP (2EP PE) class of construction work.

	All sub-contractors, appointed to perform any portion of the Works, shall have a contractor grading designation equal to or higher than a contractor grading designation determined in accordance with the class of construction work and the Value of Work that is sub-contracted. * tenderers who are capable of being so registered, or who have applied for registration but have not yet received confirmation of such registration, must provide, with this tender, acceptable documentary proof thereof)
F.2.2	**Cost of Bidding** Accept that the Employer will not compensate the tenderer for any costs incurred in the preparation and submission of a tender offer, including the costs of any testing necessary to demonstrate that aspects of the offer satisfy requirements.
F.2.3	**Check documents** Check the tender documents on receipt for completeness and notify the employer of any discrepancy or omission.
F.2.4	**Confidentiality and copyright** Treat as confidential all matters arising in connection with the tender. Use and copy the documents issued by the employer only for the purpose of preparing and submitting a proposal offer in response to the invitation.
F.2.5	**Reference documents** Obtain, as necessary for submitting a tender offer, copies of the latest versions of standards, specifications, conditions of contract and other publications, which are not attached but which are incorporated into the tender documents by reference.
F.2.6	**Acknowledge Addenda** Acknowledge receipt of addenda to the proposal documents, which the employer may issue, and if necessary apply for an extension of the closing time stated in the tender data, in order to take the addenda into account.
F.2.7	The arrangements for a **compulsory briefing/clarification meeting** are: **Date:** 22 April 2021 **Time:** 11h30 — **Location:** ERWAT Waterval Water Care Works, 1 Eike Road, Klip River No individual should represent more than one tenderer at the compulsory briefing session. Non-completion in full of the fields required on the attendance register may lead to automatic disqualification. At least one member of the JV shall be represented at the compulsory clarification meeting.
F.2.8	**Seek clarification** Questions or queries must be submitted to the Employer in writing at least ten (10) working days before the stipulated closing date and time of the tender. However, ERWAT shall not be liable nor assume liability for failure of the tenderer to receive response to any questions and / or queries raised by the tenderer by the closing time.
F.2.10	**Pricing the Tender** Tender prices shall be stated in South African Rand (ZAR). **Please note that only firm prices would be accepted by ERWAT for the purposes of tender evaluation and adjudication.**
F.2.11	**Alterations to documents** Tenderer must not make any alterations or additions to the proposal documents, except to comply with instructions issued by the employer, or necessary to correct errors made by the bidder. All signatories to the TENDER offer shall sign next to all such alterations. Erasures and the use of masking fluid are prohibited. Copies are not allowed, only original documents will be accepted.
F.2.13	**Submitting a tender offer** No late, faxed, emailed or other form of tender will be accepted. Completed tenders with attached documents, if any, must be submitted in Black ink in sealed envelopes and clearly marked **"WATERVAL WASTEWATER CARE WORKS: SUPPLY AND INSTALLATION OF 3200A RESIN ENCAPSULATED BUSBARS FOR AERATION BLOWERS PROJECT"** must be placed

	in Tender Box at ERWAT Head Office, Hartebeestfontein Office Park, R25 (Bapsfontein/Bronkhorstspruit), Kempton Park. Accept that a proposal submitted to the employer cannot be withdrawn or substituted. No substitute proposals will be considered. All tenders received by ERWAT will remain in the Company's possession.
F.2.14	**Information and data to be completed in all respects** To facilitate review of this tender by ERWAT, it is requested that submissions conform to the following format: 1. **Coversheet:** List Tender Statement, the name of your firm, and the name, address and telephone number of a contact person for questions concerning the tender submitted. 2. **Tender Document:** Provide the tender with standard forms completed in black ink. 3. **Annexures:** All additional information required in the order of and referring to the same number as Forms: Annexure A1: • Certified B-BBEE Certificate • CK1 or CK2 (if applicable) or Company Registration Forms • Certified copies of ID's of Directors • Shareholders Register • Copy of Joint Venture between parties (if applicable) Annexure A3: • Letter of Good Standing Annexure D: Resolution of Directors on Company Letterhead, Annexure E: • Audited Financial Statements for the past 3 financial years, • Copy of Municipal Statement not older than 3 months OR Letter from Landlord stating that the bidder is renting from his/her property OR Copy of Lease agreement and contact details Annexure F: Bank Statement (not older than 3 months & with bank stamp) Annexure G: Certified B-BBEE Certificate Annexure J: Background and Work Experience of Company Annexure K: Project Team Information • Organogram / Organizational structure • CV's and certificates of project team Annexure L: Additional information from Tenderer on his Engineering Workshop Annexure M: Manufacturers' data sheets and brochures

	Annexure N: Additional Information required from tenderer: Method statement including quality management plan, OHS management plan and risk assessment and preliminary work plan Annexure Q: Letter of intent to submit Third Party Liability Insurance and All risk contractors insurance to cover this contract Annexure R: Tenderer's Pro-Forma 36 month warranty on the Diesel generator
F.2.15	**Closing time** Closing date: 14 May 2021 Closing Time: 12h00
F.2.16	**Tender offer validity** The tender offer validity period is 120 Days.
F.2.18	**Provide other information** **The bidders are required to submit following documents and if requested to resubmit in case if it was not initially submitted, it will result in automatic disqualification:** (1) an original valid Tax Clearance Certificate issued by the South African Revenue Services; (2) completion of MBD 2, 4, 6.1, 7.2, 8 and 9 forms (3) copy of municipal Statement or letter from landlord stating not older than 3 months (4) In case of Joint Venture – the Joint Venture Agreement (5) Letter of intent to submit **Third Party Liability Insurance and All risk contractors insurance** to cover this contract **NB: - Please note that non-compliance to specification may be deemed as an automatic disqualification. Service Providers must quote for all aspects as per the specification.**
F.2.23	**Certificates** The Tenderer is required to submit with his Tender a letter of intent from an approved insurer undertaking to provide the Performance Guarantee to the format included in Part C1.3 of this Tender Document.
F.3.4	**Opening of Request for Proposal submissions** TENDERS will be opened in public on the 14th of May at 12h00 at ERWAT Head Office, Hartebeestfontein Office Park, R25 (Bapsfontein / Bronkhorstspruit), Kempton Park.
F.3.5	**Two-envelope System** A two-envelope procedure will **NOT** be followed.
F.3.6	**Non-disclosure** After the opening of the tender offers, no information relating to the clarification, determination of responsiveness, evaluation and comparison of tender offers and recommendations concerning the award of the tender shall be disclosed to any other Tenderer or persons not concerned with such process until the award of the tender has been announced by ERWAT.
F.3.9	**Arithmetical errors, omissions and discrepancies** ERWAT is to check BID offers for arithmetical errors in the following manner: a) Where there is a discrepancy between the amounts in words and amounts in figures, the amount in words shall govern. b) If bills of quantities or pricing schedules apply and there is an error in the line-item total resulting from the product of the unit rate and the quantity, the line-item total shall govern, and the rate shall be corrected. Where there is an obviously gross misplacement of the decimal point in the unit rate, the line item total as quoted shall govern, and the unit rate shall be corrected.

	c) Where there is an error in the total of the prices either as a result of other corrections required by this checking process or in the tenderer's addition of prices, the total of the prices shall govern, and the tenderer will be asked to revise selected item prices (and their rates if bills of quantities apply) to achieve the tendered total of the prices. Consider the rejection of a tender offer if the tenderer does not correct or accept the correction of the arithmetical error in the manner described above.
F.3.11	**Evaluation of tender offers** The Bidders notice is drawn to the fact that the evaluation, adjudication and awarding of this Tender will be in terms of the Supply Chain Management Policy of ERWAT and the Preferential Procurement Regulations of 2017. If the submitted Tender does not comply with the Tender conditions, the Tender may be rejected. If specifications are not met, the Tender may also be rejected. With regard to the above, certain actions or errors are unacceptable, and warrant REJECTION OF THE TENDER, for example: • Proof of SARS Tax status (pin issued by the South African Revenue Services); • Pages that were to be completed being removed from the Tender document and have therefore not been submitted. • Failure to fully complete form of offer. • Scratching out without initialing next to the amended rates or information. • Writing over / painting out rates / the use of Tippex/correction fluid or any erasable ink. • The Tender has not been properly signed by a party having the authority to do so, according to the Form C– "Authority for Signatory". • No authority for signatory submitted. • Particulars required in respect of the proposal have not been provided: non- compliance of Tender requirements and/or specifications. • The Bidder's attempts to influence, or has in fact influenced the evaluation and/or awarding of the contract. • The Proposal has been submitted after the relevant closing date and time. • If any municipal rates and taxes or municipal service charges owed by that Bidder or any of its directors to the company, or to any other company or municipal entity, are in arrears for more than three months (90 days). • If any Bidder who during the last five years has failed to perform satisfactorily on a previous contract with the company or any other organ of state after written notice was given to that Bidder that performance was unsatisfactory. **Good standing with SA Revenue Services** • Determine whether the bidders tax matters are in order as provided for by SARS. • The Bidder must complete the MBD 2 form in the returnable schedule and or attach their valid SARS Pin to verify their Tax matters to the designated page of the Tender document. If the Tender does not meet the requirements contained in the ERWAT Supply Chain Policy, and the mentioned framework, it will be rejected and may not subsequently be made acceptable by correction or withdrawal of the non-conforming deviation or reservation. **Penalties** ERWAT will, if upon investigation it is found that a preference in terms of the Preferential Procurement Policy Framework Act, 2000 and these regulations has been obtained on a fraudulent basis, or any specified goals are not attained in the performance of the contract, one or more of the following penalties will be imposed: • Cancel the contract and recover all losses or damages incurred or sustained from the Bidder. • Impose a financial penalty of twice the theoretical financial preference associated with the claim, which was made in the Tender.

- Restrict the firm, its shareholders and directors on obtaining any business from ERWAT for a period of 5 years and blacklisted on the National Treasury database of restricted suppliers.

Evaluation Criteria

ERWAT will establish a Bid Evaluation Committee (BEC) whose responsibility it is to make recommendations to the Bid Adjudication Committee (BAC). The Bid Evaluation Committee will short list and evaluate the bid document in accordance with the criteria below and make recommendations to the BAC:

1) **Stage 1: Pre-compliance:** Evaluation to be done and pre-qualified tenderer goes through for the technical functionality evaluation. Where some pre-compliance information is not provided the ERWAT supply chain may contact the responsible tenderer to submit within three (3) working days and failure to do so will result in disqualification.

2) **Stage 2: Technical Functionality:** Scoring of bid evaluation points for technical functionality and exclusion of those Bids that do not achieve the minimum threshold of 75 points for technical functionality. Only those bids who achieve 75 points or more for functionality will be considered further in terms of price and preference.

3) **Stage 3: Price and Preference:** Scoring of all eligible Bids having progressed through the second stage in terms of Price and Preference only, by:
   - 3.1 Confirming that Tenderers progressing beyond the second stage are eligible for the preferences claimed, and if so,
   - 3.2 Scoring Bid evaluation points for preference,
   - 3.3 Calculation of the life cycle cost and expressing the sum of capital cost (the price carried forward from the Bill of Quantities) as well as running costs as a Net Present Value, which will be used to evaluate the “Price”.
   - 3.4 Calculating the total Bid evaluation points, based on Price and Preference (80:20) to two decimal places.
   - 3.5 Rank Bid offers from the highest number of Bid evaluation points to the lowest
   - 3.6 Recommend Tenderer with the highest number of Bid evaluation points for the award of the contract, unless there are compelling and justifiable reasons not to do so.

For any tender submission to be considered, a minimum score of points must be achieved for the total score on technical functionality.

The following definitions shall apply in the evaluation of functionality:

“Similar projects”	Refers to projects where construction activities were carried out to the installation of Busbar Systems at Power stations, Substations, Industrial buildings, Plant rooms, etc. Preference will be given to modification and upgrade of existing works, where the plant is kept operational for the duration of construction, such as Waterval Wastewater Care Works, where each of Module 2 and Module 3 treats in excess of 50Ml/d each. “Similar projects” shall all have Contract values above R3million, excl. VAT.

"Health and Safety Officer"	A person who is appointed to guide construction management with the responsibilities of health and safety compliance in accordance with the Occupational Health and Safety Act and Construction Regulations 2014, who has a minimum of 10 years verifiable and specified health and safety related experience, and who is registered with the South African Council for Project and Construction Management Professionals (SACPMP) as a Construction Health and Safety Officer, or who can at least proof registration is pending by submitting proof of application from SACPMP.

FUNCTIONALITY CRITERIA: -

Note: The minimum required score for functionality is stipulated in the functionality table listed elsewhere in the document. Bidders scoring less than the stipulated threshold on functionality shall not proceed to the next stage of the evaluation.

Functionality criteria maximum points in respect of each criterion shall be as set out at the bottom of this table.

All Tender submission will be evaluated by at least three evaluators against the Table below. Tenderers shall ensure that their tender submissions are sufficiently detailed and that all required information is included in their submissions. Information not provided will result in zero points awarded for the respective item.

Tender evaluation points

Tender evaluation points will be allocated as per the Supply Chain Management policy and the Preferential Procurement Policy Framework Act, 2000: Preferential Procurement Regulations, 2017 including the following:

Preference points for this bid shall be awarded for:

(a) Price; and
(b) B-BBEE Status Level of Contribution.

	POINTS
PRICE	**80**
B-BBEE STATUS LEVEL OF CONTRIBUTION	**20**

Regulations of disputes, objections, complaints and queries will be handled in accordance with the Supply Chain Management Policy of ERWAT.

1.1 TECHNICAL / FUNCTIONALITY EVALUATION

Potential service providers will have to achieve a minimum of 75 points out of 100 for their technical proposals before their financial proposals and B-BBEE status are evaluated. This is required so that there is a level of comfort that the potential service provider can deliver the project with the required professionalism and quality.

1.1.1 SCORING PROCESS

The Technical / Functional Evaluation Task Team will be established to determine the following:

- Similar Projects/Company Experience
- The experience of the key staff proposed.
- Method statement (The quality of the method statement).

No alteration of technical / functionality proposals will be permitted after the deadline for receipt of bids. Questions may be asked for clarification needed to evaluate their proposals, but bidders would not be permitted to change the substance or price of their bids after bid opening. Requests for clarification and the bidder's responses would be made in writing. No interviews will be conducted in this regard.

SCORING CRITERIA

The score for the Technical / Functionality Evaluation will be calculated in accordance with the table below:

STAGE 2: FUNCTIONALITY

CRITERION	CRITERION DETAILS	POINTS
Similar Projects/Company Experience: Bidder must Provide only signed completion certificates and reference letters on the letterheads of the previous client/employer with a clear description of works, contract value, contact person, and contact details of the contact person (day telephone number and company email address) will be accepted	**Similar Projects/Company Experience:** Each similar project successfully completed, with certificate of completion, up to a maximum of 50 points for 5 projects. • No Submission / Irrelevant Information = 0 • 1 project = 15 • 2 projects = 30 • 3 projects = 45 • 4 projects = 60 • 5 projects = 70 Appointment Letters, Contractual Agreements, and Invoices will not be accepted. Each letter should represent the entire works completed not section or plants partially completed.	**70**
	Artisans:	

Contractor	Witness 1	Witness 2	Employer	Witness 1	Witness 2

	Expertise of key staff: Bidders to provide testimonials and/ or Curriculum Vitae(s) to prove the relevant experience. Bidders to include Organogram with Full Name and Title of Key Staff as per the hierarchy. No points shall be allocated for submission of irrelevant experience that does not speak to the Scope of Works for this Contract. Copies of the qualifications must also be attached.	The Bidder demonstrates a Master electrician (with Wiremen's License) to oversee the installation on site and two trade tested electricians (one for each of the two busbar installations) with a track record of similar projects. • Master Electrician = 6 • Electrician Installation 1 = 2 • Electrician Installation 2 = 2 • No Submission/ Irrelevant Information on each = 0 **Occupational Health and Safety Officer:** The Contractor's Occupational Health and Safety Officer is professionally registered with the SACPCMP and has at least 10 years verifiable experience. • More than 10 years' experience = 10 • More than 5 years' experience = 5 • Less than 5 years' experience = 0	**20**
	Draft method statement: Procedure to conduct work.	**Draft method statement:** Including preliminary risk assessment of how contractor intends to install two 3200A busbars, between feeder (old MCC) and incomer (new MCC), while plant remains live and aeration capacity is not lost, showing: (i) preparation and planning for installations, (ii) resources to be employed on site, (iii) Timing. • Tenderer has submitted a detailed Method Statement Inclusive of all 3 components = 10 • Tenderer has submitted a detailed Method Statement Inclusive of 2 components = 7 • Tenderer has submitted the Method Statement Inclusive of 1 component =3 • Tenderer did not submit (Methodology) = 0	**10**
	TOTAL	**Bidder must score a minimum of 75 points to be considered for father evaluation**	**100**

STAGE 3: PRICE AND PREFERENCE EVALUATION

Price:	**80**
Preference Points:	**20**
Total points for Price and Preference:	**100**

Scoring Preference Points

Preference points are scored by the tenderer in terms of their B-BBEE contribution level as per the DTI Codes of Good Practice, in accordance with the Preference Points Table below:

Preference Points table for 80/20 points system:

B-BBEE Status Level Contributor	Number of Points
1	**20**
2	**18**
3	**14**
4	**12**
5	**8**
6	**6**
7	**4**
8	**2**
Non-Compliant Contributor	**0**

Tenderers must submit their original and valid B-BBEE status level verification certificate from an accredited verification agency, or a certified copy thereof, substantiating their B-BBEE rating. Failure to do so may result in the points for Preference not being awarded to the tenderer.

Evaluation of Proposal Offers
The Tenderer notice is drawn to the fact that the evaluation, adjudication and awarding of this tender will be in terms of the Supply Chain Management Policy of ERWAT and the Preferential Procurement Regulations of 2017.

If the submitted tender does not comply with the tender conditions, the tender may be rejected. If specifications are not met, the tender may also be rejected. With regard to the above, certain actions or errors are unacceptable, and warrants **REJECTION OF THE TENDER**, for example:

- The **impact on the daily operations and performance of the plant** during installation and commissioning resulting in Reactor out of commission for a period longer than what was specified in the tender and technical specifications.
- **Performance Guarantees** -The ability of the turbo blower installation to meet the specified air flow rates at the tendered efficiency, for which deed of surety is included.
- Bidders to submit a valid active SARS Pin for verification with this tender.
- Non-submission of company registration certificates.
- Non-submission of the offer in the prescribed format.
- Pages that were to be completed being removed from the tender document and have therefore not been submitted.
- Failure to fully complete form of offer.
- Scratching out without initialling next to the amended rates or information.
- Writing over / painting out rates / the use of tippex or any erasable ink.
- Failure to attend compulsory briefing meetings
- The tender has not been properly signed by a party having the authority to do so, according to the **Form C – "Authority for Signatory".**
- No authority for signatory submitted.
- Particulars required in respect of the proposal have not been provided – non-compliance of tender requirements and/or specifications.
- The Tenderer's attempts to influence, or has in fact influenced the evaluation and/or awarding of the contract.
- The Proposal has been submitted after the relevant closing date and time.
- If any municipal rates and taxes or municipal service charges owed by that Tenderer or any of its directors to the company, or to any other company or municipal entity, are in arrears for more than three months (90 days).

	• If any Tenderer who during the last five years has failed to perform satisfactorily on a previous contract with the company or any other organ of state after written notice was given to that Tenderer that performance was unsatisfactory. If the Tender does **not** meet the requirements contained in ERWAT Supply Chain Policy, and the mentioned framework, it will be rejected and may not subsequently be made acceptable by correction or withdrawal of the non-conforming deviation or reservation.
F.3.13.1	**Tender offers will only be accepted if:** 1. the tenderer or any of its directors is not listed on the Register of Tender Defaulters in terms of the Prevention and Combating of Corrupt Activities Act, 2004 (Act No. 12 of 2004) as a person prohibited from doing business with the public sector; 2. the tenderer has not: i. abused the Employer's Supply Chain Management System; or ii. failed to perform on any previous contract and has been given a written notice to this effect; 3. the tenderer has completed, signed and submitted the PA-11.1 (EC): Declaration of Interest and Tenderer's Past Supply Chain Management Practices and there are no conflicts of interest which may impact on the tenderer's ability to perform the contract in the best interests of the employer or potentially compromise the tender process; and 4. the tenderer is registered with: i. the Unemployment Insurance Fund (UIF); and ii. the Workmen's Compensation Fund.
F.3.17	**Provide copies of the contracts** The number of paper copies of the signed contract to be provided by the Employer is **one**.
	The additional conditions of the proposal are: 1. ERWAT may also request that the Tenderer provide written evidence that his financial, labour and resources are adequate for carrying out the project. 2. ERWAT reserves the right to appoint a firm of chartered accountants and auditors and / or execute any other financial investigations on the financial resources of any Tenderer. The Tenderer shall provide all reasonable assistance in such investigations.

ERWAT
EXCELLENCE IN WATER CARE

PROJECT NO: ERW202012/TNDR-001

WATERVAL WASTEWATER CARE WORKS: SUPPLY AND INSTALLATION OF 3200A RESIN ENCAPSULATED BUSBARS FOR AERATION BLOWERS PROJECT

T2.1 RETURNABLE DOCUMENTS

ERWAT
EXCELLENCE IN WATER CARE

PROJECT NO: ERW202012/TNDR-001

WATERVAL WASTEWATER CARE WORKS: SUPPLY AND INSTALLATION OF 3200A RESIN ENCAPSULATED BUSBARS FOR AERATION BLOWERS PROJECT

T2.1 LIST OF RETURNABLE DOCUMENTS

1. Failure to fully complete and sign the relevant returnable documents shall render such a TENDER offer unresponsive.
2. Tenderer shall note that their signatures appended to each returnable form represents a declaration that they vouch for the accuracy and correctness of the information provided, including the information provided by candidates proposed for the specified key positions.
3. Notwithstanding any check or audit conducted by or on behalf of the Employer, the information provided in the returnable documents is accepted in good faith and as justification for entering into a contract with a Tenderer. If subsequently any information is found to be incorrect such discovery shall be taken as wilful misrepresentation by that Tenderer to induce the contract. In such event the Employer has the discretionary right to terminate the contract.

The Tenderer must complete and sign the following returnable Schedules:

T2.1.1 IMPORTANT: REQUIRED RETURNABLE DOCUMENTS

Returnable Schedules required for TENDER evaluation purposes

FORM A1	COMPULSORY ENTERPRISE QUESTIONAIRE
FORM A2 (MBD 2)	TAX CLEARANCE REQUIREMENTS
FORM B (MBD 4)	DECLARATION OF INTEREST
FORM C (MBD 6.1)	PREFERENCE SCHEDULE
FORM D (MBD 7.2)	CONTRACT FORM – RENDERING OF SERVICES
FORM E (MBD 8)	DECLARATION OF TENDERER'S PAST SUPPLY CHAIN MANAGEMENT PRACTICES
FORM F	AUTHORITY OF SIGNATORY

FORM G	FINANCIAL REFERENCES AND STATEMENT FROM
FORM H	TENDERER'S BANK DETAILS AND CURRENT BALANCE
FORM I	RECORD OF ADDENDA TO TENDER DOCUMENTS
FORM J (MBD 9)	CERTIFICATE OF INDEPENDENT BID DETERMINATION
FORM K	COMPANY BACKGROUND AND WORK EXPERIENCE
FORM L	SITE INSPECTION MEETING CERTIFICATE
FORM M	SUB-CONTRACTING AS PRE-QUALIFYING CONDITION OF TENDER BELOW R30 MILLION

Returnable Documents that will be incorporated into the contract

C1.1	OFFER PORTION OF FORM OF OFFER AND ACCEPTANCE
C1.2	CONTRACT DATA (PART 2)
C1.3	FORM OF GUARANTEE (THIRD PARTY LIABILITY AND ALL RISK INSURANCE)

T2.1.1 IMPORTANT: REQUIRED RETURNABLE DOCUMENTATION

Please ensure that the following supporting documents are attached to your Bid Document. Failure to submit the below mentioned documents will result in disqualification of your bid.

Item	Description of Document/Proof Sought	To be completed by the Tenderer: Please fill in Yes or No if Proof/ Documentation attached	For Office Use Only: Verified by SCM Official: Please fill in Yes or No if Proof/ Documentation attached
1.	Original or Certified copy of BBBEE Verification certificate from an accredited Verification Agency		
2.	Copy of Company/ Registration Documents		
3.	Certified Copy of ID documents of owners/members/shareholders		
4.	Resolution of Directors on Company Letterhead as described in Form D		
5.	Copy of Municipal Statement not older than 3 months OR Letter from landlord stating that you are renting from his/her property OR Copy of Lease agreement and Contact details (Statement and arrears should not be older than 3 months)		
6.	Electronic A valid original Tax Clearance Certificate		
7.	Audited Financial Statements for the past three financial years (Form F)		
8.	Letter of good standing		
9.	Letter of intent to submit Third Party Liability Insurance and All risk contractors insurance to cover this contract (Annexure Q)		
10.	Occupational Health & Safety Plan (Annexure N)		
11.	For companies: A letter from the auditors confirming shareholding percentages.		
12.	Background And Work Experience (Form J)		

ERWAT
EXCELLENCE IN WATER CARE

PROJECT NO: ERW202012/TNDR-001

WATERVAL WASTEWATER CARE WORKS: SUPPLY AND INSTALLATION OF 3200A RESIN ENCAPSULATED BUSBARS FOR AERATION BLOWERS PROJECT

T2.2 RETURNABLE SCHEDULES

RETURNABLE DOCUMENTS REQUIRED FOR TENDER EVALUATION PURPOSES

FORM A1: COMPULSORY ENTERPRISE QUESTIONNAIRE

In the case of a Joint Venture – This page is to be completed and submitted in respect of each partner

1. NAME OF ENTERPRISE _____

2. CONTACT PERSON _____

3. CONTACT NUMBER _____

4. FAX NUMBER _____

5. E-MAIL ADDRESS _____

6. POSTAL ADDRESS _____

_____

_____

_____

7. PHYSICAL ADDRESS _____

_____

_____

_____

8 VAT REGISTRATION NUMBER _____

Contractor	*Witness 1*	*Witness 2*	*Employer*	*Witness 1*	*Witness 2*

9 **TAX REFERENCE NUMBER** _____

10 **CIDB REGISTRATION NUMBER** _____

10.1 **CIDB GRADING** _____

_____

11 **HAS A B-BBEE STATUS LEVEL VERIFICATION CERTIFICATE BEEN SUBMITTED**

YES		NO	

IF YES, WHO WAS THE CERTIFICATE ISSUED BY?

AN ACCOUNTING OFFICER AS CONTEMPLATED IN THE CLOSE CORPORATION ACT (CCA)

A VERIFICATION AGENCY ACCREDITED BY THE SOUITH AFRICAN NATIONAL ACCREDITATION SYSTEM (SANAS)
A REGISTERED AUDITOR
(Tick applicable box)

(**A B-BBEE STATUS LEVEL VERIFICATION CERTIFICATE MUST BE SUBMITTED IN ORDER TO QUALIFY FOR PREFERENCE POINTS FOR B-BBEE**)

12 **ARE YOU THE ACCREDITED REPRESENTATIVE IN SOUTH AFRICA FOR THE GOODS/SERVICES/WORKS OFFERED?**

YES		NO	

If Yes enclose Proof

……...
Signature on behalf of Tenderer

ATTACH THE FOLLOWING DOCUMENTS HERETO

1. **For Closed Corporations**

   CK1 or CK2 as applicable (Founding Statement).

2. **For Companies**

   - A copy of the Certificate of Incorporation
   - Certified Copies of the ID's of the Directors and
   - The shareholders' register.

3. **For Joint Venture Agreements**

   - Copy of the Joint Venture Agreement between all the parties,
   - As well as the documents in (1) or (2) and (6) of each Joint Venture member.

4. **For Partnership**

   - Certified Copies of the ID's of the partners

5. **One person Business / Sole trader/Sole Proprietor**

   - Certified Copy of ID

6. **B-BBEE STATUS LEVEL VERIFICATION CERTIFICATE**

   - Original or certified copy and valid B-BBEE Status Level Verification Certificates from an accredited Verification Agency.

MBD 2

FORM A2: TAX CLEARANCE REQUIREMENTS

TAX CLEARANCE CERTFICATE 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 South African Revenue Service (SARS) to meet the bidder's tax obligations.

NEED A TAX CLEARANCE? GO ONLINE

- Electronically request your Tax Compliance Status which will include a unique PIN which you can provide to any third party (if requested) to enable them to verify your tax compliance status online via e-Filing.
- Request a TCC via e-filing which will give you the option to print the TCC.
- Or request a TCC at a SARS branch where a SARS agent will be able to print or e-mail the TCC to you.
- To register for e-filing go to: www.sarsefiling.co.za

A tax compliant status is a holistic view of your tax compliance level across all your registered tax types.

Is your tax compliance status green?

- Ensure all tax returns are submitted
- No outstanding debt owed to SARS
- SARS has been notified of any change of residential or business address
- Your business is registered for all required tax types e.g. PAYE, VAT, income tax.

Check your tax compliance status by logging onto your e-filing profile and viewing your "my compliance Profile" and rectify any non-compliance.

THIRD PARTY AUTHORISATION TO VIEW BIDDER TCS:

To assist with the evaluation process of your bid we require your consent to check your SARS tax compliance via e-filing. Kindly complete the table below authorising ERWAT to check TCC for tender purposes only.

TCS Details	
Tax payer name	
Trading Name	
Purpose of request	TENDER
Request Reference number	
PIN	
PIN EXPIRY DATE	

Note: Bidders may attach their Tax compliance status printout to the bidding document.

I, _____ in my capacity as _____ duly appointed as authorised

signatory holder, hereby grant **ERWAT** permission to check the TCC status of

_____ and it is duly understood that the search is for tender purposes only.

_____ _____

NAME AND SURNAME **DESIGNATION**

_____ _____

DATE **SIGNATURE**

FOR OFFICE USE ONLY:
VERIFIED ☐YES / ☐NO

Contractor	*Witness 1*	*Witness 2*	*Employer*	*Witness 1*	*Witness 2*

MBD 4

FORM B: DECLARATION OF INTEREST

1. No bid will be accepted from persons in the service of the state[1].

2. Any person, having a kinship with persons in the service of the state, including a blood relationship, may make an offer or offers in terms of this invitation to bid. In view of possible allegations of favouritism, should the resulting bid, or part thereof, be awarded to persons connected with or related to persons in service of the state, it is required that the tenderer or their authorised representative declare their position in relation to the evaluating/adjudicating authority.

3 In order to give effect to the above, the following questionnaire must be completed and submitted with the bid.

3.1 Full Name of tenderer or his or her representative: ……..

3.2 Identity Number: ……..

3.3 Position occupied in the Company (director, trustee, shareholder[2]): ……..

3.4 Company Registration Number: ……

3.5 Tax Reference Number: …….

3.6 VAT Registration Number……

3.7 The names of all directors / trustees / shareholders members, their individual identity Numbers (ID) and state employee numbers must be indicated in paragraph 4 below.

3.8 Are you presently in the service of the state? **YES / NO**

3.8.1 If yes, furnish particulars.…..……

..……

[1]MSCM Regulations: "in the service of the state" means to be –

(a) a member of –
  (i) any municipal council;
  (ii) any provincial legislature; or
  (iii) the national Assembly or the national Council of provinces;

(b) a member of the board of directors of any municipal entity;
(c) an official of any municipality or municipal entity;

(d) an employee of any national or provincial department, national or provincial public entity or constitutional institution within the meaning of the Public Finance Management Act, 1999 (Act No.1 of 1999);
(e) a member of the accounting authority of any national or provincial public entity; or
(f) An employee of Parliament or a provincial legislature.

² Shareholder" means a person who owns shares in the company and is actively involved in the management of the company or business and exercises control over the company.

3.9 Have you been in the service of the state for the past twelve months? ……..**YES / NO**

3.9.1 If yes, furnish particulars.……...……..

……...…….…….

3.10 Do you have any relationship (family, friend, other) with persons in the service of the state and who may be involved with the evaluation and or adjudication of this bid?...**YES / NO**

3.10.1 If yes, furnish particulars.

……

……

3.11 Are you, aware of any relationship (family, friend, other) between any other tenderer and any persons in the service of the state who may be involved with the evaluation and or adjudication of this bid?
.....**YES / NO**

3.11.1If yes, furnish particulars
……

…….....

3.12Are any of the company's directors, trustees, managers, principle shareholders or stakeholders in service of the state? .....**YES / NO**

1.12.1 If yes, furnish particulars.

.....

.....

3.13 Are any spouse, child or parent of the company's director's trustees, managers,

principle shareholders or stakeholders in service of the state? .....**YES / NO**

3.13.1 If yes, furnish particulars.

.....

.....

3.14 Do you or any of the directors, trustees, managers, principle shareholders, or stakeholders of this company have any interest in any other related companies or business whether or not they are bidding for this contract. **YES / NO**

3.14.1 If yes, furnish particulars:

.....

.....

4. Full details of directors / trustees / members / shareholders.

Full Name	Identity Number	State Employee Number

…….....

Signature on behalf of Tenderer

Contractor	*Witness 1*	*Witness 2*	*Employer*	*Witness 1*	*Witness 2*

MBD 6.1

FORM C: PREFERENCE SCHEDULE

PREFERENCE POINTS CLAIM FORM IN TERMS OF THE PREFERENTIAL PROCUREMENT REGULATIONS 2017

This preference form must form part of all bids invited. It contains general information and serves as a claim form for preference points for Broad-Based Black Economic Empowerment (B-BBEE) Status Level of Contribution

NB: BEFORE COMPLETING THIS FORM, BIDDERS MUST STUDY THE GENERAL CONDITIONS, DEFINITIONS AND DIRECTIVES APPLICABLE IN RESPECT OF B-BBEE, AS PRESCRIBED IN THE PREFERENTIAL PROCUREMENT REGULATIONS, 2017.

---

1. GENERAL CONDITIONS

1.1 The following preference point systems are applicable to all bids:

- the 80/20 system for requirements with a Rand value of up to R50 000 000 (all applicable taxes included); and
- the 90/10 system for requirements with a Rand value above R50 000 000 (all applicable taxes included).

1.2 The value of this bid is estimated to **not exceed** R50 000 000 (all applicable taxes included) and therefore the 80/20 preference point system shall be applicable; or

1.3 Points for this bid shall be awarded for:

(c) Price; and

(d) B-BBEE Status Level of Contributor.

1.4 The maximum points for this bid are allocated as follows:

	POINTS
PRICE	**80**
B-BBEE STATUS LEVEL OF CONTRIBUTOR	**20**
Total points for Price and B-BBEE must not exceed	**100**

1.5 Failure on the part of a bidder to submit proof of B-BBEE Status level of contributor together with the bid, will be interpreted to mean that preference points for B-BBEE status level of contribution are not claimed.

1.6 The purchaser reserves the right to require of a bidder, either before a bid is adjudicated or at any time subsequently, to substantiate any claim in regard to preferences, in any manner required by the purchaser.

2. DEFINITIONS

(a) **"B-BBEE"** means broad-based black economic empowerment as defined in section 1 of the Broad-Based Black Economic Empowerment Act;

(b) "**B-BBEE status level of contributor"** means the B-BBEE status of an entity in terms of a code of good practice on black economic empowerment, issued in terms of section 9(1) of the Broad-Based Black Economic Empowerment Act;

(c) **"bid"** means a written offer in a prescribed or stipulated form in response to an invitation by an organ of state for the provision of goods or services, through price quotations, advertised competitive bidding processes or proposals;

(d) **"Broad-Based Black Economic Empowerment Act"** means the Broad-Based Black Economic Empowerment Act, 2003 (Act No. 53 of 2003);

(e) "EME" means an Exempted Micro Enterprise in terms of a code of good practice on black economic empowerment issued in terms of section 9 (1) of the Broad-Based Black Economic Empowerment Act;

(f) **"functionality"** means the ability of a tenderer to provide goods or services in accordance with specifications as set out in the tender documents.

(g) **"prices"** includes all applicable taxes less all unconditional discounts;

(h) **"proof of B-BBEE status level of contributor"** means:

1) B-BBEE Status level certificate issued by an authorized body or person;

2) A sworn affidavit as prescribed by the B-BBEE Codes of Good Practice;

3) Any other requirement prescribed in terms of the B-BBEE Act;

(i) **"QSE"** means a qualifying small business enterprise in terms of a code of good practice on black economic empowerment issued in terms of section 9 (1) of the Broad-Based Black Economic Empowerment Act;

(j) **"rand value"** means the total estimated value of a contract in Rand, calculated at the time of bid invitation, and includes all applicable taxes;

3. POINTS AWARDED FOR PRICE

3.1 THE 80/20 OR 90/10 PREFERENCE POINT SYSTEMS

A maximum of 80 points is allocated for price on the following basis:

80/20

$$Ps = 80\left(1 - \frac{Pt - P\min}{P\min}\right)$$

Where

Ps = Points scored for price of bid under consideration

Pt = Price of bid under consideration

Pmin = Price of lowest acceptable bid

4. POINTS AWARDED FOR B-BBEE STATUS LEVEL OF CONTRIBUTOR

4.1 In terms of Regulation 6 (2) and 7 (2) of the Preferential Procurement Regulations, preference points must be awarded to a bidder for attaining the B-BBEE status level of contribution in accordance with the table below:

B-BBEE Status Level of Contributor	Number of points (80/20 system)
1	20
2	18
3	14
4	12
5	8
6	6
7	4
8	2
Non-compliant contributor	0

5. BID DECLARATION

5.1 Bidders who claim points in respect of B-BBEE Status Level of Contribution must complete the following:

6. B-BBEE STATUS LEVEL OF CONTRIBUTOR CLAIMED IN TERMS OF PARAGRAPHS 1.4 AND 4.1

6.1 B-BBEE Status Level of Contributor: . = ……(maximum of 10 or 20 points)

(Points claimed in respect of paragraph 7.1 must be in accordance with the table reflected in paragraph 4.1 and must be substantiated by relevant proof of B-BBEE status level of contributor.

7. SUB-CONTRACTING

7.1 Will any portion of the contract be sub-contracted?

(***Tick applicable box***)

YES		NO	

7.1.1 If yes, indicate:

i) What percentage of the contract will be subcontracted.....……%

ii) The name of the sub-contractor(s)…….

……

iii) The B-BBEE status level of the sub-contractor(s).....……..

……

iv) Whether the sub-contractor(s) is an EME or QSE

(Tick applicable box)

YES		NO	

v) **Bidders declaration for conforming to the following designated groups:**

Designated Group: An EME or QSE	BEE Accreditation	Signature
EME		
QSE		

8. **DECLARATION WITH REGARD TO COMPANY/FIRM**

8.1 Name of company/firm:…….

8.2 VAT registration number:……

8.3 Company registration number:…….

8.4 TYPE OF COMPANY/ FIRM

- Partnership/Joint Venture / Consortium
- One person business/sole propriety
- Close corporation
- Company
- (Pty) Limited

[TICK APPLICABLE BOX]

8.5 DESCRIBE PRINCIPAL BUSINESS ACTIVITIES

……
……
……
……..

8.6 COMPANY CLASSIFICATION

- Manufacturer
- Supplier
- Professional service provider
- Other service providers, e.g. transporter, etc.

[*TICK APPLICABLE BOX*]

8.7 **MUNICIPAL INFORMATION**

Municipality where business is situated: …….

Registered Account Number: …….

Stand Number:…….

8.8 Total number of years the company/firm has been in business:……

8.9 I/we, the undersigned, who is / are duly authorised to do so on behalf of the company/firm, certify that the points claimed, based on the B-BBE status level of contributor indicated in paragraphs 1.4 and 6.1 of the foregoing certificate, qualifies the company/ firm for the preference(s) shown and I / we acknowledge that:

i) The information furnished is true and correct;

ii) The preference points claimed are in accordance with the General Conditions as indicated in paragraph 1 of this form;

iii) In the event of a contract being awarded as a result of points claimed as shown in paragraphs 1.4 and 6.1, the contractor may be required to furnish documentary proof to the satisfaction of the purchaser that the claims are correct;

iv) If the B-BBEE status level of contributor has been claimed or obtained on a fraudulent basis or any of the conditions of contract have not been fulfilled, the purchaser may, in addition to any other remedy it may have –

(a) disqualify the person from the bidding process;

(b) recover costs, losses or damages it has incurred or suffered as a result of that person's conduct;

(c) cancel the contract and claim any damages which it has suffered as a result of having to make less favourable arrangements due to such cancellation;

(d) recommend that the bidder or contractor, its shareholders and directors, or only the shareholders and directors who acted on a fraudulent basis, be restricted by the National Treasury from obtaining business from any organ of state for a period not exceeding 10 years, after the *audi alteram partem* (hear the other side) rule has been applied; and

(e) forward the matter for criminal prosecution.

WITNESSES 1. …….. 2. ……	…… SIGNATURE(S) OF BIDDERS(S) DATE: …….. ADDRESS …….. …….. ……..

MBD 7.2

FORM D: CONTRACT FORM – RENDERING OF SERVICES

THIS FORM MUST BE FILLED IN DUPLICATE BY BOTH THE SERVICE PROVIDER (PART 1) AND THE PURCHASER (PART 2). BOTH FORMS MUST BE SIGNED IN THE ORIGINAL SO THAT THE SERVICE PROVIDER AND THE PURCHASER WOULD BE IN POSSESSION OF ORIGINALLY SIGNED CONTRACTS FOR THEIR RESPECTIVE RECORDS.

PART 1 (TO BE FILLED IN BY THE SERVICE PROVIDER)

1. I hereby undertake to render services described in the attached bidding documents to (name of the institution)…….. in accordance with the requirements and task directives / proposals specifications stipulated in Bid Number…….…….. at the price/s quoted. My offer/s remain binding upon me and open for acceptance by the Purchaser during the validity period indicated and calculated from the closing date of the bid.

2. The following documents shall be deemed to form and be read and construed as part of this agreement:

   (i) Bidding documents, *viz*
   - Invitation to bid
   - Tax clearance certificate
   - Pricing schedule(s)
   - Filled in task directive/proposal
   - Preference claims in terms of the Preferential Procurement Regulations 2001
   - Declaration of interest
   - Special Conditions of Contract;

   (ii) General Conditions of Contract; and

   (iii) Other (specify)

3. I confirm that I have satisfied myself as to the correctness and validity of my bid; that the price(s) and rate(s) quoted cover all the services specified in the bidding documents; that the price(s) and rate(s) cover all my obligations and I accept that any mistakes regarding price(s) and rate(s) and calculations will be at my own risk.

4. I accept full responsibility for the proper execution and fulfilment of all obligations and conditions devolving on me under this agreement as the principal liable for the due fulfilment of this contract.

5. I declare that I have no participation in any collusive practices with any tenderer or any other person regarding this or any other bid.

6. I confirm that I am duly authorised to sign this contract.

NAME (PRINT) ……..

CAPACITY ……..

SIGNATURE ……..

NAME OF FIRM ……..

DATE ……..

WITNESSES

1 ……..……..

2 ……..……..

DATE: ……..……..

MBD 7.2

CONTRACT FORM - RENDERING OF SERVICES

PART 2 (TO BE FILLED IN BY THE PURCHASER)

2. I…….. in my capacity as ..……..……..

accept your bid under reference number ……dated……for the rendering of services indicated hereunder and/or further specified in the annexure(s).

3. An official order indicating service delivery instructions is forthcoming.

4. I undertake to make payment for the services rendered in accordance with the terms and conditions of the contract, within 30 (thirty) days after receipt of an invoice.

DESCRIPTION OF SERVICE	**PRICE (VAT INCL)**	**COMPLETION DATE**	**PREF POINTS CLAIMED FOR HDIs**	**PREF POINTS CLAIMED FOR RDP GOALS**

4. I confirm that I am duly authorised to sign this contract.

SIGNED AT …… ON ……..

NAME (PRINT) ……

SIGNATURE ……

OFFICIAL STAMP

WITNESSES

1 ……

2 ……

DATE: ……..

Contractor	*Witness 1*	*Witness 2*	*Employer*	*Witness 1*	*Witness 2*

MBD 8

FORM E: DECLARATION OF TENDERER'S PAST SUPPLY CHAIN MANAGEMENT PRACTICES

1 This Municipal Bidding Document must form part of all bids invited.

2 It serves as a declaration to be used by municipalities and municipal entities in ensuring that when goods and services are being procured, all reasonable steps are taken to combat the abuse of the supply chain management system.

3 The bid of any tenderer may be rejected if that tenderer, or any of its directors have:

a. abused the company's / municipal entity's supply chain management system or committed any improper conduct in relation to such system;
b. been convicted for fraud or corruption during the past five years;
c. willfully neglected, reneged on or failed to comply with any government, municipal or other public sector contract during the past five years; or
d. Been listed in the Register for Tender Defaulters in terms of section 29 of the Prevention and Combating of Corrupt Activities Act (No 12 of 2004).

4 In order to give effect to the above, the following questionnaire must be completed and submitted with the bid.

Item	Question	Yes	No
4.1	Is the tenderer 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? (Companies or persons who are listed on this Database were informed in writing of this restriction by the Accounting Officer/Authority of the institution that imposed the restriction after the *audi alteram partem* rule was applied). The Database of Restricted Suppliers now resides on the National Treasury's website (www.treasury.gov.za) and can be accessed by clicking on its link at the bottom of the home page.	Yes ☐	No ☐
4.1.1	If so, furnish particulars:		
4.2	Is the tenderer or any of its directors listed on the Register for Tender Defaulters in terms of section 29 of the Prevention and Combating of Corrupt Activities Act (No 12 of 2004)? The Register for Tender Defaulters can be accessed on the National Treasury's website (www.treasury.gov.za) by clicking on its link at the bottom of the home page.	Yes ☐	No ☐

4.2.1	If so, furnish particulars:		
4.3	Was the tenderer or any of its directors convicted by a court of law (including a court of law outside the Republic of South Africa) for fraud or corruption during the past five years?	Yes ☐	No ☐
4.3.1	If so, furnish particulars:		
4.4	Does the tenderer or any of its directors owe any municipal rates and taxes or municipal charges to the company / municipal entity, or to any other municipality / municipal entity, that is in arrears for more than three months?	Yes ☐	No ☐
4.4.1	If so, furnish particulars:		
4.5	Was any contract between the tenderer and the municipality / municipal entity or any other organ of state terminated during the past five years on account of failure to perform on or comply with the contract?	Yes ☐	No ☐
4.7.1	If so, furnish particulars:		

CERTIFICATION

I, THE UNDERSIGNED (FULL NAME)……

CERTIFY THAT THE INFORMATION FURNISHED ON THIS DECLARATION FORM IS TRUE AND CORRECT.

I ACCEPT THAT, IN ADDITION TO CANCELLATION OF A CONTRACT, ACTION MAY BE TAKEN AGAINST ME SHOULD THIS DECLARATION PROVE TO BE FALSE.

……...

Signature on behalf of Tenderer

FORM F: AUTHORITY OF SIGNATORY

The bid shall be signed by a person duly authorised thereto and the following is applicable:

Company: A resolution by its board of directors authorising a director or other official of the company to sign the documents on behalf of the company.

Close Corporation: A resolution by its members authorising a member or other official of the corporation to sign the documents on each member's behalf.

Partnership: All the partners shall sign the documents unless one partner or a group of partners has been authorised to sign on behalf of each partner, in which case proof of such authorisation shall be included in the bid.

Joint Venture: Should two or more firms jointly submit a bid, the bid shall be accompanied by the document of establishment of the joint venture, duly registered and authenticated by a notary public or other official deputed to witness sworn statements, which defines the conditions under which the joint venture will function, the period of duration, the persons authorised to represent the Joint Venture and who are obligated thereby, the participation of the several firms forming the joint venture, and well as any other information necessary to permit a full appraisal of its functioning.

One Man Concern: This shall be clearly stated and all documents shall be signed accordingly.

Details of person responsible for Bid Document process:

Name : ----------

Contact number : ----------

Office address : ----------

Signatories for close corporations and companies shall confirm their authority by attaching to this form a **duly signed and dated original or certified copy on the Company Letterhead** of the relevant resolution of their members or their board of directors, as the case may be.

PRO-FORMA FOR COMPANIES AND CLOSE CORPORATIONS:

"By resolution of the board of directors passed on *(date)*

_____

Prof./Dr/Mr/Ms

_____

has been duly authorized to sign all documents in connection with the Bid Document for Contract Number

_____ and any Contract which may arise there from on

behalf of

_____

(BLOCK CAPTIALS)

SIGNED ON BEHALF OF THE COMPANY

_____

IN HIS CAPACITY AS

_____

DATE

_____

FULL NAMES OF SIGNATORY

_____

AS WITNESSES: **1.** _____

2. _____

PRO-FORMA FOR JOINT VENTURES:
Certificate of Authority for Joint Ventures

We, the undersigned, are submitting this Bid Document offer in Joint Venture and hereby authorise Mr/Ms _____, authorised signatory of the company _____, acting in the capacity of lead partner, to sign all documents in connection with the Bid Document offer an any contract resulting from it on our behalf.

NAME OF FIRM	ADDRESS	DULY AUTHORISED SIGNATORY
		Signature:……. Name:……. Designation:……..
		Signature:……. Name:……. Designation:……..
		Signature:……. Name:……. Designation:……..
		Signature:……. Name:……. Designation:……..

N.B.: THE DULY SIGNED AND DATED ORIGINAL OR CERTIFIED COPY OF AUTHORITY OF SIGNATORY ON COMPANY LETTERHEAD SHOULD BE INCLUDED IN THE RETURNABLE DOCUMENTS PACK.

FORM G: Municipal Statements

The tenderer shall append with Annexure E

(1) Copy of Municipal Statement not older than 3 months OR Letter from Landlord stating that the bidder is renting from his/her property OR Copy of Lease agreement and contact details.

…….....

Signature on behalf of Tenderer

FORM H: FINANCIAL REFERENCES

DETAILS OF TENDERER BANKING INFORMATION

Notes to Tenderer:

1. The Tenderer shall attach to this form a letter from the bank statement (not older than 3 months & with bank stamp) and details. Failure to provide the required letter with the TENDER submission shall render the Tenderer's offer unresponsive.
2. The Tenderer's banking details as they appear below shall be completed.
3. In the event that the Tenderer is a joint venture enterprise, details of all the members of the joint venture shall be similarly provided and attached to this form.

BANK NAME:	
ACCOUNT NAME: *(e.g. ABC Civil Construction cc)*	
ACCOUNT TYPE: *(e.g. Savings, Cheque etc.)*	
ACCOUNT NO:	
ADDRESS OF BANK:	
CONTACT PERSON:	
TEL. NO. OF BANK / CONTACT:	
How long has this account been in existence:	0-6 months ☐ 7-12 months ☐ 13-24 months ☐ More than 24 months ☐ (Tick which is appropriate)

N.B.: BANK STATEMENT (NOT OLDER THAN THREE MONTHS) SHOULD BE INCLUDED IN THE RETURNABLE DOCUMENTS PACK.

……...

Signature on behalf of Tenderer

FORM I: RECORD OF ADDENDA TO TENDER DOCUMENTS

We confirm that the following communication received from the Employer before the submission of this TENDER offer, amending the TENDER documents, have been taken into account in this TENDER offer:

	Date	Title of Details

…….

Signature on behalf of Tenderer

MBD 9

FORM J: CERTIFICATE OF INDEPENDENT BID DETERMINATION

1. This Municipal Bidding Document (MBD) must form part of all bids[1] invited.

2 Section 4 (1) (b) (iii) of the Competition Act No. 89 of 1998, as amended, prohibits an agreement between, or concerted practice by, firms, or a decision by an association of firms, if it is between parties in a horizontal relationship and if it involves collusive bidding (or bid rigging).[2] Collusive bidding is as per prohibition meaning that it cannot be justified under any grounds.

3 Municipal Supply Regulation 38 (1) prescribes that a supply chain management policy must provide measures for the combating of abuse of the supply chain management system, and must enable the accounting officer, among others, to:

a. take all reasonable steps to prevent such abuse;

b. reject the bid of any tenderer if that tenderer or any of its directors has abused the supply chain management system of the municipality or municipal entity or has committed any improper conduct in relation to such system; and

c. cancel a contract awarded to a person if the person committed any corrupt or fraudulent act during the bidding process or the execution of the contract.

4 This MBD serves as a certificate of declaration that would be used by institutions to ensure that, when bids are considered, reasonable steps are taken to prevent any form of bid-rigging.

5 In order to give effect to the above, the attached Certificate of Bid Determination (MBD 9) must be completed and submitted with the bid:

[1] Includes price quotations, advertised competitive bids, limited bids and offers.

[2] Bid rigging (or collusive bidding) occurs when businesses, that would otherwise be expected to compete, secretly conspire to raise prices or lower the quality of goods and / or services for purchasers who wish to acquire goods and / or services through a bidding process. Bid rigging is, therefore, an agreement between competitors not to compete.

CERTIFICATE OF INDEPENDENT BID DETERMINATION

I, the undersigned, in submitting the accompanying bid:

(Bid Number and Description)

In response to the invitation for the bid made by:

_____

(Name of Municipality / Municipal Entity)

Do hereby make the following statements that I certify to be true and complete in every respect:

I certify, on behalf of:

_____that:

(Name of Tenderer)

1. I have read and I understand the contents of this Certificate;
2. I understand that the accompanying bid will be disqualified if this Certificate is found not to be true and complete in every respect;
3. I am authorized by the tenderer to sign this Certificate, and to submit the accompanying bid, on behalf of the tenderer;
4. Each person whose signature appears on the accompanying bid has been authorized by the tenderer to determine the terms of, and to sign, the bid, on behalf of the tenderer;
5. For the purposes of this Certificate and the accompanying bid, I understand that the word “competitor” shall include any individual or organization, other than the tenderer, whether or not affiliated with the tenderer, who:

    (a) Has been requested to submit a bid in response to this bid invitation;
    (b) Could potentially submit a bid in response to this bid invitation, based on their qualifications, abilities or experience; and
    (c) Provides the same goods and services as the tenderer and/or is in the same line of business as the tenderer

6. The tenderer has arrived at the accompanying bid independently from, and without consultation, communication, agreement or arrangement with any competitor. However communication between partners in a joint venture or consortium[3] will not be construed as collusive bidding.
7. In particular, without limiting the generality of paragraphs 6 above, there has been no consultation, communication, agreement or arrangement with any competitor regarding:
    (a) prices;
    (b) Geographical area where product or service will be rendered (market allocation)
    (c) Methods, factors or formulas used to calculate prices;
    (d) The intention or decision to submit or not to submit, a bid;
    (e) The submission of a bid which does not meet the specifications and conditions of the bid; or
    (f) Bidding with the intention not to win the bid.
8. In addition, there have been no consultations, communications, agreements or arrangements with any competitor regarding the quality, quantity, specifications and conditions or delivery particulars of the products or services to which this bid invitation relates.
9. The terms of the accompanying bid have not been, and will not be, disclosed by the tenderer, directly or indirectly, to any competitor, prior to the date and time of the official bid opening or of the awarding of the contract.
10. I am aware that, in addition and without prejudice to any other remedy provided to combat any restrictive practices related to bids and contracts, bids that are suspicious will be reported to the Competition Commission for investigation and possible imposition of administrative penalties in terms of section 59 of the Competition Act No 89 of 1998 and or may be reported to the National Prosecuting Authority (NPA) for criminal investigation and or may be restricted from conducting business with the public sector for a period not exceeding ten (10) years in terms of the Prevention and Combating of Corrupt Activities Act No 12 of 2004 or any other applicable legislation.

.....

Signature on behalf of Tenderer

[3] Joint venture or Consortium means an association of persons for the purpose of combining their expertise, property, capital, efforts, skill and knowledge in an activity for the execution of a contract.

FORM K: BACKGROUND AND WORK EXPERIENCE

Tenderers shall attach a general description of the capabilities of their company, including information related to its history, overall size, location of company headquarters, local office location and type of business (partnership, corporation, etc.). For proposed sub-consultants, please provide the name of each firm, the office location, contact name and telephone number and the services to be provided.

Briefly summarize the Company's experience with regard to busbar installations in industrial buildings / municipal wastewater treatment plants, design and construction within the last 7 years. Select up to seven projects completed in South Africa within 7 years immediately preceding the date of this TENDER submission, that are similar in scope and magnitude to this project. Each plant must have operated successfully for at least 1 year prior to this TENDER being submitted. For each project completed, attach to Annexure J herewith a Certificate of Completion.

The tenderer shall insert in the spaces provided below a list of similar completed contracts awarded to him and those currently being undertaken, with attached references as required.

	EMPLOYER (NAME, TEL, E-MAIL	CONSULTING ENGINEER (NAME, TEL, E-MAIL)	PROJECT TITLE AND DESCRIPTION OF WORK INCL CAPACITY OF THE WORKS	VALUE OF WORK R	COMPLETION DATE
PROJECT 1					
PROJECT 2					

	EMPLOYER (NAME, TEL No. AND E-MAIL	CONSULTING ENGINEER (NAME, TEL No. AND E-MAIL)	PROJECT TITLE AND DESCRIPTION OF WORK INCL CAPACITY OF THE WORKS	VALUE OF WORK R(m)	COMPLETION DATE
	COMPLETED CONTRACTS				
PROJECT 3					
PROJECT 4					
PROJECT 5					
PROJECT 6					
PROJECT 7					

……

Signature on behalf of Tenderer

FORM L: SITE INSPECTION MEETING CERTIFICATE

PROJECT TITLE:	**WATERVAL WASTEWATER CARE WORKS: SUPPLY AND INSTALLATION OF 3200A RESIN ENCAPSULATED BUSBARS FOR AERATION BLOWERS PROJECT**		
TENDER NO:	ERW202012/TNDR-001	**Closing date:**	As advertised

This is to certify that I, _____

representing the Company _____

in the company of _____

visited the site on: _____

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 explanations given at the site inspection meeting and that I understand perfectly the work to be done, as specified and implied, in the execution of this contract.

Name of Tenderer	Signature	Date

Name of Client Representative	Signature	Date

FORM M: SUB-CONTRACTING AS PRE-QUALIFYING CONDITION OF TENDER BELOW R30 MILLION

Regulation 4 of the Preferential Procurement Policy Act, 2000 (Act 5 of 2000) – Preferential Procurement Regulations, 2017 provides the following:

1. **Pre-qualification criteria for preferential procurement:**

*"**4.** (1)If an organ of state decides to apply pre-qualifying criteria to advance certain designated groups, that organ of state must advertise the tender with a specific tendering condition that only one or more of the following tenderers may respond-*

~~(a) a tenderer having a stipulated minimum B-BBEE status level of contributor;~~

(b) an EME or QSE;

~~(c) a tenderer subcontracting a minimum of 30% to-~~

~~(i) an EME or QSE which is at least 51% owned by black people;~~
~~(ii) an EME or QSE which is at least 51% owned by black people who are youth;~~
~~(iii) an EME or QSE which is at least 51% owned by black people who are women;~~
~~(iv) an EME or QSE which is at least 51% owned by black people with disabilities;~~
~~(v) an EME or QSE which is 51% owned by black people living in rural or underdeveloped areas or townships;~~
~~(vi) a cooperative which is at least 51% owned by black people;~~
~~(vii) an EME or QSE which is at least 51% owned by black people who are military veterans;~~
~~(viii) an EME or QSE.~~

(2) A tender that fails to meet any pre-qualifying criteria stipulated in the tender documents is an unacceptable tender."

2. **Bidders attention is drawn to the definitions applicable to this section as set out in the MBD 6.1 form.**

3. **BIDDERS DECLARATION FOR CONFORMING TO THE FOLLOWING ADVANCED DESIGNATED GROUPS:**

NO.	ADVANCE DESIGNATED G R O U P S	B-BBEE Accreditation	SIGNATURE
1	an EME or QSE [(1)(b)];		

ERWAT
EXCELLENCE IN WATER CARE

PROJECT NO: ERW202012/TNDR-001

WATERVAL WASTEWATER CARE WORKS: SUPPLY AND INSTALLATION OF 3200A RESIN ENCAPSULATED BUSBARS FOR AERATION BLOWERS PROJECT

THE CONTRACT

C1 – C6

ERWAT
EXCELLENCE IN WATER CARE

PROJECT NO: ERW202012/TNDR-001

WATERVAL WASTEWATER CARE WORKS: SUPPLY AND INSTALLATION OF 3200A RESIN ENCAPSULATED BUSBARS FOR AERATION BLOWERS PROJECT

C. THE CONTRACT

ERWAT
EXCELLENCE IN WATER CARE

PROJECT NO: ERW202012/TNDR-001

WATERVAL WASTEWATER CARE WORKS: SUPPLY AND INSTALLATION OF 3200A RESIN ENCAPSULATED BUSBARS FOR AERATION BLOWERS PROJECT

C1 AGREEMENTS AND CONTRACT DATA

C1.1 FORM OF OFFER AND ACCEPTANCE

OFFER

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

PROJECT NO: ERW202012/TNDR-001
WATERVAL WASTEWATER CARE WORKS:
SUPPLY AND INSTALLATION OF 3200A RESIN ENCAPSULATED BUSBARS FOR AERATION BLOWERS PROJECT

The Tenderer, 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 Tenderer, deemed to be duly authorised, signing this part of this Form of Offer and Acceptance, the Tenderer 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.

THE OFFERED TOTAL FOR ALL THE WORKS (THE PRICES INCLUSIVE OF VALUE ADDED TAX) IS

……

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

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 Tenderer before the end of the period of validity stated in the Tender Data, whereupon the Tenderer becomes the party named as the Contractor in the Conditions of Contract identified in the Contract Data.

Signature(s) _____ _____

Name(s) _____ _____

Capacity _____ _____

For the Tenderer

_____

(Name and address of organisation)

Name & Signature
Of Witness _____ _____

Name Date

Contractor	*Witness 1*	*Witness 2*	*Employer*	*Witness 1*	*Witness 2*

ACCEPTANCE

By signing this part of this Form of Offer and Acceptance, the Employer identified below accepts the Tenderer'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 Tenderer's Offer shall form an agreement between the Employer and the Tenderer 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:

- Agreements and Contract Data (which includes this Agreement)
- Pricing Data
- Scope of Work and Site information
- Technical specifications
- Additional Documentation

And drawings and documents or parts thereof, which may be incorporated by reference into Parts 1 to 4 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 Tenderer 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 Tenderer 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 Tenderer receives one fully completed original copy of this document, including the Schedule of Deviations (if any). Unless the Tenderer (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.

Signature(s) _____ _____

Name(s) _____ _____

Capacity _____ _____

For the Employer

_____

(ERWAT)

Name & Signature
Of Witness _____ _____

Name Date

Contractor	*Witness 1*	*Witness 2*	*Employer*	*Witness 1*	*Witness 2*

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 Tenderer's covering letter shall not be included in the final contract document. Should any matter in such letter, which constitutes a deviation as aforesaid becomes 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

3 Subject

Details

4 Subject

Details

5 Subject

Details

6 Subject

Details

Contractor	*Witness 1*	*Witness 2*	*Employer*	*Witness 1*	*Witness 2*

By the duly authorised representatives signing this Schedule of Deviations, the Employer and the Tenderer 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 agreed by the Tenderer and the Employer during this process of Offer and Acceptance. 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 Tenderer 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 TENDERER:

Signatures (s) _____ _____

Name(s) _____ _____

Capacity _____ _____

_____

(Name and address of Organisation)

Name & Signature
Of Witness _____ Date _____

FOR THE EMPLOYER

Signatures (s) _____ _____

Name(s) _____ _____

Capacity _____ _____

_____

(Name and address of Organisation)

Name & Signature
Of Witness _____ Date _____

C1.2 CONTRACT DATA

PART 1: DATA PROVIDED BY THE EMPLOYER

CONDITIONS OF CONTRACT

The Conditions of Contract are the *General Conditions of Contract 2010 (GCC 2010)* prepared and published by the South African Institution of Civil Engineers (SAICE). Although originally developed for civil engineering construction contracts, the revised *General Conditions of Contract 2010* are equally suitable for mechanical and electrical engineering contracts. Documents can be ordered from SAICE who can be contacted through their website www.saice.org.za.

Each item of data given below is cross-referenced to the clause in the Conditions of Contract to which it mainly applies.

PART 1: Amendments, additions and data provided by the Employer in terms of the General Conditions of Contract 2010

Clause	Data
1.1.1.13	The Defects Liability Period is **12** months.
1.1.1.14 and 5.5	The time allowed for practical completion of the Works shall be **14 Weeks** from the Commencement date. Practical completion is defined as per Specification SC: General Decommissioning and Commissioning as the successful completion of Day 30 Commissioning tests.
1.1.1.14	**PROJECT SCOPE** The scope of this Contract includes the supply and installation of equipment and infrastructure for two new busbar routes connecting Feeder 1 (Old MCC) to Incomer 1 (New MCC) and Feeder 2 (Old MCC) to Incomer 2 (New MCC) with all ancillary plant work for ERWAT Waterval Wastewater Care Works, Modules 2 and 3, including: • Manufacture, supply and Install new resin encapsulated 3200A rated aluminium busbars to accommodate electrical load of five Siemens Aeration Compressors (@ 400kW each) between Feeder (Old) and Incomer (New) MCC's; • Install all mounting brackets, cable ladders for flexible leads and all necessary methods of earthing for busbar connection; • Decommissioning, disconnection and removal of all existing temporary supply cables in a staged manner to ensure maximum continued operation; • Termination on new flexible leads to existing Feeder and Incomer MCC's; • Modifications to the air inlet plenum Eastern wall to allow busbar access inside plenum and to Incomer MCC; • Modification to the air inlet plenum door position to accommodate busbars running against the Blower house Northern wall; • Remove existing door and install new galvanized door in the plenum • Minor building and structural work in order to install the door in the plenum • Core drilling for the installation of the Busbars where required.

	• Testing and commissioning of the installation with Certificate of Compliance from qualified Master Electrician. • Permanent sealing of existing cable openings in walls with a non-shrink grout. The maximum permissible down-time for the final installation, termination and commissioning of busbar installations shall be 12 Hours from shut-down per Module, after which the system shall be manually operational (any four out of five turbo blowers running in local mode). The time allowed for work to reach **Milestone A**, shall be **6 Weeks** from the Commencement date. Milestone A is achieved with practical completion of Installation A, as specified in the Scope of Works. The time allowed for work to reach **Milestone B**, shall be a further 8 weeks, i.e. 14 weeks from the Commencement date. Milestone B is defined to be Practical Completion of the project, with regard to all aspects and installation of the busbar system, which periods includes a successful 30 days commissioning period, starting with the Day 01 commissioning tests and completing with the Day 30 commissioning tests.
1.1.1.15 **1.2.1.2**	The Name of the Employer is **Ekurhuleni Water Care Company**(**ERWAT)** **The address of the Employer is**: The Managing Director ERWAT Hartebeestfontein Office Park R25 (Bapsfontein/Bronkhorstspruit) Kempton Park Telephone: 011 929 7000
1.1.1.16 **1.2.1.2**	The name of the Client's Representative is: **Virtual Consulting Engineers** **The address of the Client's Representative is:** 57 George Storrar Drive Groenkloof, Pretoria, 0181 Telephone : 012 452 0444 Facsimile : 012 452 0583
1.3.1	**Waivers:** The waiver (whether express or implied) by any party of any breach of the terms or conditions of this Agreement by the other party shall not prejudice any remedy of the waiving party in respect of any continuing or other breach of the terms and conditions hereof. No favour, delay, relaxation or indulgence on the part of any party in exercising any power or right conferred on such party in terms of this Agreement shall operate as a waiver of such power or right nor shall any single or partial exercise of any such power or right preclude any other or further exercises thereof or the exercise of any other power or right under this Agreement.
Add	**Confidentiality**: It is recorded that the Contractor has given the undertakings contained

1.3.6	in this clause in consideration of the benefits and advantages, which it will gain by virtue of entering into this Contract with ERWAT. The Contractor hereby acknowledges that the restraints contained herein are fair and reasonable and go no further than reasonably necessary to protect the proprietary interests of ERWAT. By virtue of the fact that the Contractor will be executing the works for ERWAT, he will have, and will continue to have, access to ERWAT's trade secrets and confidential information, which are referred to as "Confidential Records". Having regard to the above, and in order to protect the proprietary interests of ERWAT as aforesaid, the Contractor undertakes in favour of ERWAT in addition to and without limiting any other undertakings given by him in this paragraph, that: He will not, whether directly or indirectly, use any of the Confidential Records of ERWAT or divulge or disclose them to any other persons whomsoever, without the prior written consent of ERWAT. Any Confidential Records which may have come into his possession shall be: • Deemed to be the property of ERWAT; and accordingly; • Surrendered by him/her to ERWAT on termination or on demand by ERWAT. • He/she shall not retain any copies of the Confidential Records. The Contractor shall not, during the currency of this Agreement, or after the termination of the Agreement, be entitled whether for his/her own benefit or that of others, to make use or avail himself/herself of or derive profit from any information or knowledge specifically related to the business or affairs of ERWAT which he shall or may have acquired by reason of his position in or association with the business of ERWAT. The Contractor undertakes, that he/she will not at any time during this Agreement, or after termination hereof, disclose to a third party any information which comes to his knowledge as a result hereof, not being information which comes from an independent third person, and which relates to: • Any business or method or practice or clients or alliances of ERWAT; • Any technical information, know-how or process or method of ERWAT.
Add 1.3.7	**Status of Contractor:** Notwithstanding anything to the contrary, whether express or implied, contained in this Agreement, the Contractor specifically agrees and acknowledges that: • the Contractor is not "an employee" as defined in any South African legislation; • the provisions relating to dismissal or the residual unfair labour practice provisions contained in the Labour Relations Act, No. 66 of 1995, shall not be applied, directly or indirectly, to this Agreement; • a valid and lawful termination of this Agreement shall be deemed to constitute a "fair dismissal" of the Contractor for any and all purposes; and, • upon termination of this Agreement for any reason, he will not be entitled to, nor will he claim, any retrenchment, discontinuation or severance benefits, irrespective of the circumstances giving rise to any such claim.

	The Contractor shall not be entitled to any employment benefits, overtime payments, commission or the like or any payment therefore. The relationship between ERWAT and the Contractor shall not be deemed to be one of employer/employee and the Contractor specifically agrees that ERWAT shall not in any way be liable to the Contractor under the provisions of any legislation purporting to create such an employment relationship. This Agreement does not constitute and shall not be deemed to create a principal/agent relationship or joint venture or partnership between the parties.
3.1.3	Approval of the Employer is required for i). Cessions – issuing of cessions by the Contractor is expressly prohibited except if and when prior written approval of the Employer under the signature of the Municipal Manager for the issue of the cession has been requested and obtained ii). Use of contingencies – for all items for which rates have not been approved in terms the contract. iii). Extension of Time – extension of time can only be granted by the Employer.
3.1.4	The Contractor, in its utilisation of site facilities made available by ERWAT, must abide by the health, safety and related regulations and security measures as prescribed by ERWAT from time to time.
4.1.1	The Contractor shall at all times faithfully and timeously carry out and execute the Works and shall use its best endeavours to properly conduct, improve, extend and develop the business of ERWAT.
Add 4.1.2.1	The Contractor shall design portions of the Works as specified in the Scope of Works.
Add 4.1.2.2	The Contract shall submit the particulars of his designs as required by the Scope of Works to the Engineer for acceptance. A reason for not accepting the Contractor's design could be that it does not comply with the Scope of Works, the Standard Specifications, Particular Specifications or any of the Applicable Laws.
Add 4.1.2.3	The Contractor shall not proceed with the relevant work until the Engineer has accepted his design.
Add 4.1.2.4	The Contractor may submit his design for acceptance in parts only if the design of each part can be assessed fully.
4.3.1	The Contractor must at all times adhere to all policies, procedures and practices of ERWAT which have been incorporated in the Scope of Work and as may be in existence in all areas of operation of ERWAT from time to time. Changes in these policies, procedures and practices affecting the Work will not have to be implemented unless the parties agree on the relevant time and cost impact thereof.
4.4.	**Sub-contracting** – the contractor shall not sub contract the whole contract. No work may be sub-contracted to another party unless approval is given by the Client's Representative in writing. The Contractor is to submit to the Client's Representative in writing a request for appointment of a particular sub-contractor. Accompanying this request is to be the full detail of the sub-contractor, including: ▪ Previous experience ▪ Work which will be sub-contracted to him/her ▪ Approximate value of the work to be sub-contracted

	Before the Client's Representative in terms of Clause 49 hereof issues any certificate that includes any payment in respect of work done or goods supplied by any sub-contractor appointed in accordance with the provisions of Clause 6.3 of the General Conditions of Contract for Construction works (2010, Second Edition), he shall be entitled to call upon the Contractor to furnish reasonable proof that all payments (less retention moneys) included in previous certificates in respect of the work or goods of such sub-contractors have been made or discharged by the Contractor, in default of which, unless the Contractor: ✓ Informs the Client's Representative in writing that he has reasonable cause for withholding or refusing such payment; and ✓ Submits to the Client's Representative reasonable proof that he has so informed such sub-contractor in writing.
4.5.3	The Contractor shall only be responsible for obtaining any consent, permission and permit for the execution of the Works in as far as same is required by law to be obtained in the name of the Contractor, is within the Scope of Work and within the Contractor's control.
Add 4.6.1.1	**Intellectual Property:** In the event of any claim or claims in respect of an infringement of any intellectual property rights, relating to any part of the Goods supplied by the Contractor (other than a part based on a design specified by the Employer) the Contractor will at their expense either replace or modify such a part with a non-infringing part or procure for the Employer the right to use such a part provided the Contractor is given the full opportunity to conduct all negotiations in respect of such claim and such claim shall not be accepted by the Employer without the prior written consent of the Contractor. The Employer warrants that any design, parts or instructions furnished or given by him shall not be such as to cause the Contractor to infringe any intellectual property rights in the execution of the order.
Add 4.6.1.2	The Employer shall have no claim of whatsoever nature against the Contractor for any direct damages suffered by the Employer as a result of and pertaining only to any intellectual property right, relating to any of the Goods supplied, having been infringed, cancelled, voided, breached or otherwise set aside or declared invalid.
Add 4.6.1.3	The intellectual property rights held by the Contractor, its affiliates and its licensors relating to Goods tendered or supplied by the Contractor shall remain the absolute property of the Contractor and its licensors. The Contractor's designs and drawings shall not be reproduced or disclosed without the Contractor's written consent. The Employer will not, without the Contractor's previous written consent, copy or allow others to copy any drawings, Goods or part thereof supplied by the Contractor.
4.9.1	**Construction Equipment** - All construction equipment and plant on site shall be in a good working order and is to be in such a condition that it can achieve production rates which are typical of the industry standards. Should any equipment, in the opinion of the Client's Representative, be substandard or breaks down frequently to such an extent that it affects the progress on the project, the Client's Representative may instruct the Contractor to replace such equipment
5.3.1	The Contractor shall commence executing the Works within **14** days from the Commencement Date.
5.3.1	The documentation required before commencement with Works execution are: • Health & Safety Plan (Refer to Cl. 4.3)

	• Initial Programme (Refer to Cl. 5.6) • Security (Deed of Guarantee) (refer to Cl. 6.2) • Third Party Liability Insurance (Refer to Cl. 8.6)
5.3.2	The time to submit the documentation required before commencement with Works execution is **21** days.
5.4.1	The commencement date shall be the date of signing of the Contract. Possession of site shall not be granted prior to the finalisation and signing of the Contract.
5.4.2	The Waterval Wastewater Care Works is an operational Plant where the Employer's operational staff is working. Working areas needs to be barricaded and signs erected to limit access to the construction working areas. The work required to provide the Employer with a fully functional system will be divided in more than one Contract. The Contractor shall accommodate and provide assistance to all other Contractors and the Employer's staff to ensure successful commissioning of the works. Remuneration for such accommodation and provision of assistance shall be deemed to be included with the Contractor's Preliminary and General items in the Bill of Quantities.
5.8.1	The special non-working days are the official builder's holiday plus all statutory public holidays. The year-end break / builder's holiday commences on 16 December each year and ends on 04 January of the next year.
5.12	There shall be no delay caused by inclement weather conditions and work shall continue within the blower house during inclement weather as if weather was good.
5.13.1	a) The penalty for failing to complete the works within the time allowed is R 4,500.00 per day. b) The penalty for failing to complete the installation work, within the allowed duration of shutdown, and during which time parts of the plant, from either feeder 1 or feeder 2, will not be operational, and during which time the wastewater treatment plant will have limited processing capacity, is **R 1,000.00 per hour** for installation and start-up of blowers on feeder 2/incomer 2 and **R 1,000.00 per hour** for installation and start-up of blowers on feeder 1/incomer 1. Penalties for failing to complete the works at defined Milestones, for shutdowns and for the works as a whole shall be cumulative.
Add 5.13.1.1	Penalties imposed for a delay, as specified above, shall be the sole and entire liability of the Contractor with respect to the damages suffered by the Employer as a result of such delay.
5.16.3	The latent defect period is 10 years after date of Certificate of Completion.
6.2.1	The security to be provided by the Contractor shall be the Performance Guarantee of 10% of the total value of the Contract as indicated on the Form of Offer and Acceptance C1.1.
6.2.2	The Form of Performance Guarantee is to contain the wording of the pro-forma document included in the General Conditions of Contract (Pro-forma included in section C1.3 to this document).
6.3.2.1	**Variations**: No variation in terms of clause 6.3 of GCC 2010 shall be effective or binding

	on the Contractor in absence of written agreement as to the time and additional cost impact the variation will have.
6.8.1	All Contract payments shall be based on the tendered rates in South African Rand only and no currency exchange rate variation shall be accommodated in the Contract pricing. The Contractor shall therefore be required to take out Foreign Exchange Insurance to hedge the risk of currency fluctuations for the import of machinery and equipment
6.8.2	Contract Price Adjustment (CPA) shall **NOT** be applied to this contract.
6.9.1	**Plant & Materials -** All materials shall comply with the requirements of the South African Bureau of Standards, and shall bear the official standardization mark. Where SABS standard does not exist for a certain material, or a material does not bear the official standardization mark, the Client's Representatives approval of such material must be gained before use thereof.
6.10.1	The Contractor shall from time to time during the currency of this Agreement, invoice ERWAT for the Work rendered by it. The Contractor must comply with such other requirements for submitting invoices as ERWAT may reasonably require. No payment will be made to the Contractor unless an invoice has been submitted.
6.10.4	The Contractor's invoice will be paid within 30 (THIRTY) days from the date on which the invoice has been received by ERWAT. To ensure timeous payment, the payment certificate shall be submitted to ERWAT HO before the 25th day of each/ any month.
6.10.1.5	The percentage advance on materials not yet built into the Permanent Works but received on site is **85**%.
6.10.3	**The percentage retention on the amounts due to the Contractor is 10%.**
6.10.6.1	The Contractor must within 30 (THIRTY) days of the date of signature of the Contract provide proof to the satisfaction of ERWAT that it has made the required arrangements with the South African Revenue Services to ensure that income tax is payable by it. Failing provision of such proof, ERWAT will deduct income tax from the fee payable to the Contractor.
7.3.1	The Contractor may utilise certain facilities on the site of works to assist in executing the work. Such facilities include but is not limited to water, electricity and ablution.
8.4	The Contractor utilises all site facilities made available by ERWAT entirely at its own risk and ERWAT shall not be liable to the Contractor for any loss or damage whatsoever or howsoever caused out of or in connection with the use of such facilities.
Add 8.2.2.4	The ownership of equipment designed, manufactured and supplied under Contract shall effectively transfer to the Employer upon certification of payment for the equipment under the relevant payment item.
8.3	No party shall be liable for failure to perform any obligation in terms hereof in the event and to the extent that such failure is caused by force majeure.
8.6.1.1.2	The value of the materials supplied by the Employer to be included in the insurance sum is nil.
8.6.1.1.3	The amount to cover professional fees for repairing damage and loss to be included in the insurance sum is nil.
8.6.1.3	The limit of indemnity for liability insurance is equal to the contract value
9.1	The Client Representative shall give the Contractor a written termination notice on behalf of the Employer if the circumstances and performance of the Contractor in terms of the contract warrants such action.

9.2	ERWAT's right to terminate this Contract shall be regulated by Clause 9.2 of the GCC 2010 and the Law of Contract.
10.11.1	The expiry or termination of this Contract shall not prejudice the rights of any party in respect of any antecedent breach or non-performance by the other party of any of the terms or conditions hereof.

PART 2: DATA PROVIDED BY THE CONTRACTOR

The Contractor is advised to read the *General Conditions of Contract for Construction Works (2010, Second Edition)*, published by the South African Institution of Civil Engineers, in order to understand the implications of this Data which is required to be completed.

Each item of data given below is cross-referenced to the clause of Conditions of Contract to which it mainly applies.

Clause	Data
1.1	The **Contractor** is: Name: ……
1.2	The Address of the Contractor is: Address (physical): ……. …….. Address (postal): …….. Telephone: ……. Facsimile: …… E-mail: ……..

C1.3 FORM OF PERFORMANCE GUARANTEE

FORM OF PERFORMANCE GUARANTEE

PROJECT NO: ERW202012/TNDR-001

WATERVAL WASTEWATER CARE WORKS:
SUPPLY AND INSTALLATION OF 3200A RESIN ENCAPSULATED BUSBARS FOR AERATION BLOWERS PROJECT

TO BE PROVIDED ON BANK LETTER HEADED PAPER

PRO FORMA : PERFORMANCE GUARANTEE

EMPLOYER AND CONTRACT DETAILS AND DEFINITIONS

Employer means Ekurhuleni Water Care Company (ERWAT)

Physical address Hartebeestfontein Office Park, 25 (Bronkhorstspruit/Bapsfontein), Kempton Park, South Africa

Employer's signatory 1 _____ Capacity _____

Employer's signatory 2 _____ Capacity _____

Engineer means Virtual Consulting Engineers

Works means SUPPLY AND INSTALLATION OF 3200A RESIN ENCAPSULATED BUSBARS FOR AERATION BLOWERS PROJECT: Tender No ERW202012/TNDR-001

Site means Waterval Wastewater Care Works

CONTRACTOR DETAILS AND DEFINITIONS

Contractor means _____

Physical address _____

Contractor's signatory 1 _____ Capacity _____

Contractor's signatory 2 _____ Capacity _____

Performance Guarantee sum means *(amount)* _____

Amount in words _____

GUARANTOR DETAILS AND DEFINITIONS

Guarantor means _____

Physical address _____

_____

Guarantor's signatory 1 _____ Capacity _____

Guarantor's signatory 2 _____ Capacity _____

_____

AGREEMENT DETAILS

WHEREAS in terms of the General Conditions of the Contract (2010) the Contractor is required to furnish an acceptable independent guarantee for the due and proper fulfilment by him of all his duties and obligations in terms of the said contract, we the undersigned Guarantor undertakes, in the event of the Contractor failing duly and properly to fulfil any of his duties and obligations in terms of the said Contract or if the Contractor is placed under provisional liquidation or in the event of termination of the Contract by the Employer in terms of the General Conditions of Contract, to pay to the Employer, the Performance Guarantee Sum or such portion thereof as may be required by the Employer, immediately upon receiving written demand from the Employer which written demand shall be addressed to the Guarantor at his stated address. The Guarantor further hereby renounces the benefits of the legal exceptions:
Exceptio non numerate pecuniae
Exception non causa debiti
Beneficium duobus vel pluribus reis debendi
Beneficium ordinis deu excussionis
Beneficium Divisionis

and all other defence which could be pleaded against the validity of this guarantee, with the meaning and effect of which it declares itself to be fully acquainted.

This undertaking shall remain in full force and effect up to and including the date of issue of the Certificate of Completion, as provided for in the General Conditions of Contract, unless the Guarantor is advised in writing by the Employer 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. Notwithstanding the aforesaid, the Employer may at its' sole discretion elect to have the amount provided for under this guarantee, paid out directly to it in the case of breach of contract by the Contractor by giving the Guarantor written notice to that effect, notwithstanding the fact that the Employer may decide not to institute any further legal action against the contractor.

This document is not negotiable or transferable.

Signed at _____ Date _____

Guarantor's Signatory 1 _____ Guarantor's Signatory 2 _____

Witness 1 _____ Witness 2 _____

Guarantor's seal or stamp

LIST OF FINANCIAL INSTITUTIONS FROM WHICH GUARANTEES WILL BE ACCEPTED:

1. **National Banks**:
   ABSA Bank Ltd.
   Development Bank of Southern Africa
   First Rand Bank Ltd.
   Gensec Bank Ltd,
   Industrial Development Corporation of South Africa
   Infrastructure Finance Corporation
   Investec Bank Ltd.
   Land & Agricultural Bank of SA
   Mercantile Bank Ltd.
   Nedbank Ltd.
   South African Reserve Bank
   Standard Bank of SA Ltd.

2. **International Banks (with branches in SA):**
   Barclays Bank plc.
   Citibank n.a.
   Commerzbank Aktiengesellschaft
   Credit Agricole Corporate and Investment Bank
   Deutsche Bank AG
   ING Bank N.V. (South Africa Branch)
   JP Morgan Chase Bank
   Societe Generale
   Standard Chartered Bank

3. **Insurance Companies:**
   ABSA Insurance
   AIG South Africa
   Auto & General
   Coface s.a.
   Compass Insurance Co.
   Constantia Insurance Co.
   Credit Guarantee Insurance Co.
   Emeral Insurance Company
   Etana Insurance Company Ltd.
   Federated Employers Mutual Assurance Co
   Global Insurance Company
   Guardrisk Insurance Co.
   Hannover Re
   Home Loan Insurance Co.
   Lion of Africa Insurance Company
   Lombard Insurance
   Metropolitan Life
   Metropolitan Odyssey Ltd.
   MUA Insurance
   Mutual & Federal Insurance Co.
   National Housing Finance Co.
   New National Assurance Co.

Rand Mutual Assurance Company
Regent Insurance Co.
Renasa Insurance Company Ltd.
SA Eagle Insurance Company
Santam Limited
Zurich Insurance Co.

C1.4 OCCUPATIONAL HEALTH AND SAFETY

C1.4 Occupational Health and Safety

AGREEMENT IN TERMS OF THE OCCUPATIONAL HEALTH AND SAFETY ACT, 1993 (ACT NO 85 OF 1993)

THIS AGREEMENT IS made at .....

on the ..... day of ..... in the year ……

Between EKURHULENI WATER CARE COMPANY(ERWAT) (hereinafter called "the Employer") of the one

part, herein represented by .....

In his capacity as .....

and delegate of the Employer in terms of the Employer's standard powers of delegation pursuant to the provisions of Act No 7 of 1998,

and .....

(hereinafter called "the Mandatory") of the other part, herein represented by .....

.....

in his capacity as .....

and being duly authorized by virtue of a resolution appended hereto as Annexure A;

WHEREAS the Employer requires certain works be constructed, viz WATERVAL WASTEWATER CARE WORKS: POWER SUPPLY, CONTROL SYSTEM, AIR MANIFOLD AND ANCILLARY WORK REQUIRED FOR NEW AERATION BLOWERS and has accepted a Bid by the Mandatory for the construction, completion and maintenance of such Works and whereas the Employer and the Mandatory have agreed to certain arrangements and procedures to be followed in order to ensure compliance by the Mandatory with the provisions of the Occupational Health and Safety Act, 1993 (Act 85 of 1993).

NOW THEREFORE THIS AGREEMENT WITNESSETH AS FOLLOWS:

1. The Mandatory shall execute the work in accordance with the Contract Documents pertaining to this Contract.

2. This Agreement shall hold good from its Commencement Date, which shall be the date of a written notice from the Employer or engineer requiring him to commence the execution of the Works, to either -

(a) the date of the Final Approval Certificate issued in terms of Clause 5.16 of the General Conditions of Contract 2010 (hereinafter referred to as "the GCC"), as contained in the Contract Documents pertaining to this Contract, or

(b) The date of termination of the Contract in terms of Clauses 9.1, 9.2, 9.3 of the GCC.

3. The Mandatory declares himself to be conversant with the following:

(a) All the requirements, regulations and standards of the Occupational Health and Safety Act (Act 85 of 1993), hereinafter referred to as "The Act", together with its amendments and with special reference to the following Sections of The Act:

(i) Section 8 : General duties of Employers to their employees

(ii) Section 9 : General duties of Employers and self-employed persons to persons other than employees

(iii) Section 37 : Acts or omissions by employees or mandatories

(iv) Sub-section 37(2) relating to the purpose and meaning of this Agreement

(b) The procedures and safety rules of the Employer as pertaining to the Mandatory and to all his subcontractors.

4. In addition to the requirements of Clause 8.4 of the GCC (as amended by Special Condition of Contract) and all relevant requirements of the above-mentioned Volume, the Mandatory agrees to execute all the Works forming part of this Contract and to operate and utilize all machinery, Plant and equipment in accordance with the Act.

5. The Mandatory is responsible for the compliance with the Act; the safety procedures and rules of the employer by all his subcontractors, whether or not selected and/or approved by the Employer.

6. The Mandatory warrants that all his and his subcontractors' workmen are covered in terms of the Compensation for Occupational Injuries and Diseases Act, 1993 (Act No 130 of 1993), which cover, shall remain in force whilst any such workmen are present on site. A letter of good standing from the Compensation Commissioner to this effect must be produced to the Employer upon signature of the agreement.

7. The Mandatory undertakes to ensure that he and/or subcontractors and/or their respective employers will at all times comply with the following conditions:

a) The Mandatory shall assume the responsibility in terms of Section 16.1 of the Act. The Mandatory shall not delegate any duty in terms of Section 16.2 of this Act without the prior written approval of the Employer. If the Mandatory obtains such approval and delegates any duty in terms of section 16.2 a copy of such written delegation shall immediately be forwarded to the Employer.

b) All incidents referred to in the Act shall be reported by the Mandatory to the Department of Labour as well as to the Employer. The Employer will further be provided with copies of all written documentation relating to any incident.

c) The Employer hereby obtains an interest in the issue of any formal enquiry conducted in terms of section 32 of the Act into any incident involving the Mandatory and/or his employees and/or his subcontractors.

In witness hereof the parties are to set their signatures hereon in the presence of the subscribing witnesses:

SIGNED FOR AND ON BEHALF OF THE EMPLOYER..... :

Witness	.....	Witness	.....
(Name) (Print)	.....	(Name) (Print)	.....

SIGNED FOR AND ON BEHALF OF THE MANDATORY : .....

Witness	.....	Witness	.....
(Name) (Print)	.....	(Name) (Print)	.....

ANNEXURE A

CERTIFICATE OF AUTHORITY FOR SIGNATORY TO AGREEMENT IN TERMS OF OCCUPATIONAL HEALTH AND SAFETY ACT, 1993 (ACT NO 85 OF 1993)

The signatory for the company that is the Contractor in terms of the above-mentioned Contract and the Mandatory in terms of the above-mentioned Act shall confirm his or her authority thereto by attaching to this page a duly signed and dated copy of the relevant resolution of the board of directors.

By resolution of the board of directors passed at a meeting held on ..... 20….....,

Mr//Ms ..... whose signature

appears below, has been duly authorised to sign the AGREEMENT IN TERMS OF THE

OCCUPATIONAL HEALTH AND SAFETY ACT, 1993 (ACT 85 OF 1993) on behalf of .....

SIGNED ON BEHALF OF THE COMPANY : .....

IN HIS/HER CAPACITY AS : .....

DATE : .....

SIGNATURE OF SIGNATORY : .....

WITNESS : ..... WITNESS : .....

NAME (in capitals): ..... NAME :.....

C1.5 CORPORATE GOVERNANCE BREACH CLAUSE

1. Ekurhuleni Water Care Company("ERWAT") requires [insert name of company] ("the Company") to comply, mutatis mutandis with the Code contained in the King III Report and Code of Good Corporate Governance (below "the Code") for the term of this Agreement and any extension thereof.

2. The Company irrevocably undertakes and agrees that it will, mutatis mutandis, comply with the Code for the term of this Agreement and any extensions thereof.

3. The Company acknowledges and agrees that:

   3.1 It is essential that the Company complies with the Code, in order to discharge all of its obligations under and in terms of the Agreement in a proper, efficient and professional manner, and

   3.2 ERWAT will be prejudiced and may suffer damages in the event of the Company failing to comply with the Code.

4. The Company shall be required, within seven (7) days of the end of each calendar month during the term of this Agreement (and any extensions thereof), to furnish ERWAT with a written certificate, signed by the directors of the Company [alternatively members of the Close Corporation], certifying that the Company has complied with the provisions of the Code during the preceding months.

5. ERWAT shall have the right, without assigning any reason therefore and at any time, to appoint either the Institute of Directors of South Africa or a firm of chartered accountants or attorneys, to conduct an audit of the business and affairs of the Company in order to ascertain whether the Company is indeed complying with the terms of the Code. To this end, the Company irrevocably undertakes and agrees to co-operate fully with the party conducting such investigation for and on behalf of ERWAT and to make available to such party all such documentation and all such information as the investigation party may require to fully discharge its obligations under and in terms hereof and to report fully to ERWAT. In the event of it being found that the Company is not complying with the Code, then ERWAT shall be entitled to (a) regard this as a breach of the agreement and (b) recover the costs of the investigation, on an attorney and client basis, from the Company. In the event of it being found that the Company is, in fact, discharging its obligations under and in terms of the Code, then ERWAT shall bear the costs incurred in such investigation. In either of the foregoing events, the Company shall be entitled to receive a copy of the written report once same has been concluded by the investigating party.

6. In the event of the Code being replaced with another Code (or similar document), then such replacement document shall replace the Code and a reference to the Code shall be deemed to be a reference to such replacement document. The reference to the Code shall be deemed to include any statutory codification of directors' obligations and duties which may be enacted in the Republic of South Africa at any time in the future.

7. In entering into this Agreement, the Company represents and warrants to ERWAT that it is familiar with the Code, that it fully understands and appreciates the rights, obligations and recommendations therein contained and agrees to be bound thereby as herein recorded.

Initial: _____

ERWAT
EXCELLENCE IN WATER CARE

PROJECT NO: ERW202012/TNDR-001

WATERVAL WASTEWATER CARE WORKS: SUPPLY AND INSTALLATION OF 3200A RESIN ENCAPSULATED BUSBARS FOR AERATION BLOWERS PROJECT

C2 PRICING DATA

ERWAT
EXCELLENCE IN WATER CARE

PROJECT NO: ERW202012/TNDR-001

WATERVAL WASTEWATER CARE WORKS: SUPPLY AND INSTALLATION OF 3200A RESIN ENCAPSULATED BUSBARS FOR AERATION BLOWERS PROJECT

C2.1 PRICING INSTRUCTIONS

1. GENERAL

The Bill of Quantities forms part of the Contract Documents and must be read and priced in conjunction with all the other documents comprising the Contract Documents, which include the Conditions of Tender, Conditions of Contract, the Specifications (including the Standard, Project and Particular Specifications) and the Drawings.

2. DESCRIPTION OF ITEMS IN THE SCHEDULE

The Bill of Quantities has been drawn up generally in accordance with Civil Engineering Quantities 1990 issued by the SA Institution of Civil Engineers.

The short descriptions of the items in the Bill of Quantities are for identification purposes only and the measurement and payment clause of the Standardized Specifications and the Particular Specifications, read together with the relevant clauses of the Project Specification and directives on the drawings, set out what ancillary or associated work and activities are included in the rates for the operations specified.

3. QUANTITIES REFLECTED IN THE SCHEDULE

The quantities given in the Bill of Quantities are estimates only, and subject to remeasuring during the execution of the work. The Contractor shall obtain the Engineer's detailed instructions for all work before ordering any materials or executing work or making arrangements for it.

The Works as finally completed in accordance with the Contract shall be measured and paid for as specified in the Bill of Quantities and in accordance with the General and Special Conditions of Contract, the Standard, Project and Particular Specifications and the Drawings. Unless otherwise stated, items are measured net in accordance with the Drawings, and no allowance has been made for waste.

The validity of the contract will in no way be affected by differences between the quantities in the Bill of Quantities and the quantities finally certified for payment.

4. PROVISIONAL SUMS

Where Provisional sums or Prime Cost sums are provided for items in the Bill of Quantities, payment for the work done under such items will be made in accordance with Clause 6.6 of the General Conditions of Contract 2010. The Employer reserves the right, during the execution of the works, to adjust the stated amounts upwards or downwards according to the work actually done under the item, or the item may be omitted altogether, without affecting the validity of the Contract.

The Tenderer shall not under any circumstances whatsoever delete or amend any of the sums inserted in the "Amount" column of the Bill of Quantities and in the Summary of the Bill of Quantities unless ordered or authorized in writing by the Employer before closure of tenders. Unauthorized changes made by the Tenderer to provisional items in the Bill of Quantities, or to the provisional percentages and sums in the Summary of the Bill of Quantities will lead to the disqualification of the Tenderer.

5. PRICING OF THE BILL OF QUANTITIES

The prices and rates to be inserted by the Tenderer in the Bill of Quantities shall be the full inclusive prices to be paid by the Employer for the work described under the several items, and shall include full compensation for all costs and expenses that may be required in and for the completion and maintenance during the defects liability period of all the work described and as shown on the drawings as well as all overheads, profits, incidentals and the cost of all general risks, liabilities and obligations set forth or implied in the documents on which the Tender is based:

Tender no: **ERW202012/TNDR-001**

Each item shall be priced and extended to the "Total' column by the Tenderer, with the exception of the items for which only rates are required, or items which already have Prime Cost or Provisional Sums affixed thereto. If the Tenderer omits to price any items in the Bill of Quantities, then these items will be considered to have a nil rate or price.

All items for which terminology such as "inclusive" or "not applicable" have been added by the Tenderer will be regarded as having a nil rate which shall be valid irrespective of any change in quantities during the execution of the Contract.

The Tenderer shall fill in rates for all items where the words "rate only' appear in the "Total" column. "Rate Only" items have been included where:

(a) an alternative item or material is contemplated;

(b) variations of specified components in the make-up of a pay item may be expected; and

(c) no work under the item is foreseen at tender stage but the possibility that such work may be required is not excluded.

For 'Rate Only" items no quantities are given in the "Quantity" column but the quoted rate shall apply in the event of work under this item being required. The Tenderer shall however note that in terms of the Tender Data the Tenderer may be asked to reconsider any such rates which the Employer may regard as unbalanced.

All rates and amounts quoted in the Bill of Quantities shall be in Rands and cents and shall include all levies and taxes (other than VAT). VAT will be added in the summary of the Bill of Quantities.

The Tenderer shall be deemed to have inspected and examined the Site and its surroundings and information available in connection therewith and to have satisfied himself before submitting his tender (as far as is practicable) as to:

(a) the form and nature of the Site and its surroundings, including subsurface conditions,

(b) the hydrological and climatic conditions,

(c) the extent and nature of work and materials necessary for the execution and completion of the Works,

(d) the means of access to the Site and the accommodation he may require

and, in general, shall be deemed to have obtained all information (as far as is practicable) as to risks, contingencies and all other circumstances which may influence or affect his Tender.

6. CORRECTION OF ENTRIES

Incorrect entries shall not be erased or obliterated with correction fluid but must be crossed out neatly. The correct figures must be entered above or adjacent to the deleted entry, and the alteration must be initialled by the Tenderer.

7. ARITHMETICAL ERRORS

Arithmetical errors found in the Bill of Quantities as a result of faulty multiplication or addition, will be corrected by the Engineer at the tender evaluation stage, as set out in the Tender Data:
Tender no: **ERW202012/TNDR-001**

8. UNITS OF MEASUREMENT

The units of measurement described in the Bill of Quantities are metric units for which the standard international abbreviations are used. Non-standard abbreviations which may appear in the Bill of Quantities are as follows:

No.	=	Number
%	=	Percent
Sum	=	Lump sum
PCsum	=	Prime cost sum
Prov sum	=	Provisional sum
m³.km	=	Cubic metre per kilometre
km-pas	=	kilometre - pass
m².pass	=	square metre per pass
ℓ	=	litre
m	=	metre
m^2	=	square metre
m^3	=	cubic metre
t	=	ton

SECTION A:	**GENERAL**
SCHEDULE NO 1:	PRELIMINARY, GENERAL AND OTHER CONTRACTUAL REQUIREMENTS
SECTION B:	**CONSTRUCTION WORK**
SCHEDULE NO 2:	BUSBAR INSTALLATION AND ASSOCIATED ELECTRICAL WORK
SCHEDULE NO 3:	BUILDING AND STRUCTURAL REPAIRS

ERWAT
EXCELLENCE IN WATER CARE

PROJECT NO: ERW202012/TNDR-001

WATERVAL WASTEWATER CARE WORKS: SUPPLY AND INSTALLATION OF 3200A RESIN ENCAPSULATED BUSBARS FOR AERATION BLOWERS PROJECT

C2.2 BILL OF QUANTITIES

TENDER NUMBER: ERW202012/TNDR-001

EKURHULENI WATER CARE COMPANY (ERWAT)

WATERVAL WASTEWATER CARE WORKS: SUPPLY AND INSTALLATION OF 3200A RESIN ENCAPSULATED BUSBAR SYSTEM FOR AERATION BLOWERS PROJECT

SCHEDULE OF QUANTITIES

NB TENDERERS MUST COMPLETE THE SCHEDULE OF QUANTITIES IN BLACK INK

SECTION A: GENERAL

SCHEDULE NO 1: PRELIMINARY, GENERAL AND OTHER CONTRACTUAL REQUIREMENTS

ITEM NO	PAYMENT REFERS TO	DESCRIPTION	UNIT	QUAN-TITY	RATE	AMOUNT
1		**SCHEDULE NO 1:**				
1.1	**SANS 1200 A**	**PRELIMINARY, GENERAL AND OTHER**				
1.1.1	**PSA 8.3**	**Scheduled Fixed-charge and Value-related Items:**				
1.1.1.1	**PSA 8.3.1**	Fixed preliminary and general charges	Sum	-	-	
1.1.1.3	**PSA 8.4.1**	Scheduled time-related items for Busbar Installation	Month	2		
1.2	**PSA 8.8**	**TEMPORARY WORKS**				
1.2.1		**Additional tests**				
1.2.1.1	**PSA 8.8.4.4**	Additional tests required by the Engineer	PC Sum	-	-	20 000.00
1.2.1.2		Attendance and Profit	%	20 000.00	.....%	
1.30	**SI 06**	**COMPLIANCE WITH OHS ACT AND CONSTRUCTION REGULATIONS 2014**				
1.3.1	**SI 06.02.01**	**Fixed charged items**				
1.3.1.1		Preparation of Health and Safety Plan	Sum	-	-	
1.3.1.2		Health and Safety Training	Sum	-	-	
1.3.1.3		Personal Protective Equipment and Clothing	Sum	-	-	
1.3.1.4		Fences, Signs and Barricades	Sum	-	-	
1.3.1.5		Establishment of Safety Administration	Sum	-	-	
1.3.1.6		Other Health and Safety fixed charged obligations including compliance with COVID-19 regulations	Sum	-	-	
1.3.2	**SI 06.02.02**	**Time-related items**				
1.3.2.1		Implementation and maintenance of Health and Safety Plan	Month	2		
1.3.2.2		Implementation and maintenance of Training	Month	2		
1.3.2.3		Maintenance and Personal Protective Equipment and Clothing	Month	2		
1.3.2.4		Maintenance of fencing, signage and barricading	Month	2		
1.3.2.5		Implementation and maintenance of Safety Administration	Month	2		
1.3.2.6		Other Health and Safety fixed charged obligations including compliance with COVID-19 regulations	Month	2		
1.4		**MISCELANEOUS WORK**				
1.4.1		Repair existing services, found in faulty condition during excavation or survey	Prov Sum	-	-	50000
	TOTAL SCHEDULE NO 1: CARRIED TO SUMMARY					

SECTION B : CONSTRUCTION WORK

SCHEDULE NO 2: BUSBAR INSTALLATION AND ASSOCIATED ELECTRICAL WORK

ITEM NO	PAYMENT REFERS TO	DESCRIPTION	UNIT	QUAN-TITY	RATE	AMOUNT
		SCHEDULE NO 2:				
2		**ELECTRICAL EQUIPMENT**				
2.1		**SUPPLY AND INSTALLATION OF 3200A TPN RESIN ENCAPSULATED ALUMINIUM BUSBAR SYSTEM:**				
2.1.1		**BUSBAR SYSTEM: RUN 1 FEEDER_1 TO INCOMER_1**				
2.1.1.1	**PAB 09**	Supply and delivery of 3200A Resin Encapsulated Aluminium Busbars :				
		a) Straight Busbar Lengths	m	40		
		b) Bends for Busbar Installation	number	13		
		c) Busbar Panel Ends	number	2		
		d) Cable leads and lugs set in order to be termianted from new Busbar to exisitng MCC's Busbars	number	48		
		e) Joint Packs for Busbar installation	number	25		
		f) Trapeze Brackets	number	52		
2.1.1.2	**PAB 09**	Installation of 3200A Resin Encapsulated Aluminium Busbars :				
		a) Straight Busbar Lengths	m	40		
		b) Bends for Busbar Installation	number	13		
		c) Busbar Panel Ends	number	2		
		d) 120mm² Polybraid Cable leads and lugs set in order to be termianted from new Busbar to exisitng MCC's Busbars	number	48		
		e) Joint Packs for Busbar installation	number	25		
		f) Trapeze Brackets for busbar secured to concrete roof with chemical anchors	number	52		
2.1.1.3	**SC 12.03**	Commissioning and Testing of busbar installation from Feeder_1 to Incomer_1	sum	-	-	
2.2		**BUSBAR SYSTEM: RUN 2 FEEDER_2 TO INCOMER_2**				
2.2.1	**PAB 09**	Supply and delivery of 3200A Resin Encapsulated Aluminium Busbars :				
		a) Straight Busbar Lengths	m	45		
		b) Bends for Busbar Installation	number	13		
		c) Busbar Panel Ends	number	2		
		d) 120mm² Polybraid Cable leads and lugs set in order to be termianted from new Busbar to exisitng MCC's Busbars	number	48		
		e) Joint Packs for Busbar installation	number	27		
		f) Trapeze Brackets	number	56		
	Carried forward					

SECTION B : CONSTRUCTION WORK

SCHEDULE NO 2: BUSBAR INSTALLATION AND ASSOCIATED ELECTRICAL WORK

ITEM NO	PAYMENT REFERS TO	DESCRIPTION	UNIT	QUAN-TITY	RATE	AMOUNT
	Brought forward					
2.2.2	**PAB 09**	Installation of 3200A Resin Encapsulated Aluminium Busbars :				
		a) Straight Busbar Lengths	m	45		
		b) Bends for Busbar Installation	number	13		
		c) Busbar Panel Ends	number	2		
		d) 120mm² Polybraid Cable leads and lugs set in order to be termianted from new Busbar to exisitng MCC's Busbars	number	48		
		e) Joint Packs for Busbar installation	number	27		
		f) Trapeze Brackets for busbar secured to concrete roof with chemical anchors	number	56		
2.2.3	**SC 12.03**	Commissioning and Testing of busbar installation from Feeder_2 to Incomer_2	sum	-	-	
2.3	**PAB 09**	**Design and Engineering**				
		a) Design drawings and Engineering work to be performed by the contractor. Drawings and Engineering work to be submitted to the Engineer for approval before manufacturing and installation.	sum	-	-	
2.4	**PAB 10.10**	Disconnect existing PVC/SWA/PVC Cu LV cables from existing MCC for removal purposes:				
		a) 240 mm², 1-core	number	96		
		b) 95 mm², BCEW	number	48		
2.5	**PAB 10.03 SC12.01**	Removal of PVC/SWA/PVC Cu LV cable from cable racks and trenches in Blower room and deliver to ERWAT stores on site. Cables to be neatly coiled in lenghts:				
		a) 240 mm², 1-core	m	2200		
		b) 95 mm², BCEW	m	580		
2.6		**MV Switching**				
		a) Provide sum for switching off the transformers and MV network with a specialist/certified contractor	sum	-	-	
2.7	**PAB 10.23**	**Certificate of Compliance**				
		a) Provide Certificate of Compliance for busbar Installations and Connections	number	2		
2.8	**PAB 10.24.01**	**Earthing and Bonding**				
2.8.1		Earth bar and all internal bonding and earthing of new busbar installation and existing MCC's	sum	-	-	
2.9		**Cleaning and preparation of working area**				
		a) Provide sum for cleaning and preparing all working surfaces and areas for busbar installation before and after installation	sum	-	-	
	TOTAL SCHEDULE NO 2: CARRIED TO SUMMARY OF CONSTRUCTION WORK					

SECTION B : CONSTRUCTION WORK

SCHEDULE NO 3: BUILDING AND STRUCTURAL REPAIRS

ITEM NO	PAYMENT REFERS TO	DESCRIPTION	UNIT	QUAN-TITY	RATE	AMOUNT
		SCHEDULE NO 3:				
3		**BUILDING & STRUCTURAL WORK**				
3.1		**RELOCATION OF EXISTING STEEL DOOR IN PLENUM**				
3.1.1		Break out existing Plenum steel door and frame and make good surfaces for concrete casting. Remains of door frame to be discarded	Sum	1		
3.1.2		Break existing plenum wall for new door location for installation of new door (door measured elsewhere)	m^3	1		
3.1.3		Cart broken concrete rubble to unspecified site and dump	m^3	2		
3.1.4		Temporary dust shield (shutterboard) to isolate the work area from the rest of the plenum. The dust shield must be installed with minimal dust during operation of the blowers and form an air tight seal (1.9m x 2.4m)	No	1		
3.1.5		Supply and install Industrial galvanized steel door similar to the existing door (approx dimensions 2.1m x 0.9m Galvanised Steel door) with lockable door handles on both sides of the door	No	1		
3.2	**SANS 1200G**	**CONCRETE STRUCTURAL SCHEDULED ITEMS**				
3.2.1		Formwork for reconstruction of plenum wall				
3.2.1.1	**8.2.2**	Smooth verical plain				
3.2.1.1.1	**8.2.2**	For plenum wall (inside and outside) for filling wall where existing door is removed	m^2	6		
3.2.1.2	**8.2.6**	For Busbar space through plenum wall				
3.2.1.2.1	**8.2.6**	Box out holes/ for voids (1m x 0.25m)	m^2	0.4		
3.3.1	**8.4.3**	Strength conrete 35Mpa/19mm for				
3.3.1.1		For plenum wall (inside and outside) for filling wall where existing door is removed	m^3	0.6		
3.3	**8.7**	**GROUTING**				
3.3.1		Apply expanding cement based grout simialr or equal to abe dura grout to repair openings in 300mm thick concrete wall. Product to be approved by Engineer	m^3	1		
3.4		**CORE DRILLING**				
3.4.1		Core drill hole through existing reinforced concrete slab not exceeding 400mm thick and repair afterwards all surfaces disturbed. (Filling of concrete and backfill measured elsewhere) for diameter:				
3.4.1.1		110mm	number	2		
3.4.1.2		160mm	number	2		
3.4.1.3		250mm	number	2		
	TOTAL SCHEDULE NO 3: CARRIED TO SUMMARY OF CONSTRUCTION WORK					

TENDER NUMBER: ERW202012/TNDR-001

EKURHULENI WATER CARE COMPANY (ERWAT)

WATERVAL WASTEWATER CARE WORKS: SUPPLY AND INSTALLATION OF 3200A RESIN ENCAPSULATED BUSBAR SYSTEM FOR AERATION BLOWERS PROJECT

CALCULATION OF TENDER SUM

SCHEDULE 1: PRELIMINARY AND GENERAL	R _____
SCHEDULE 2: BUSBAR INSTALLATION AND ASSCOCIATED ELECTRICAL WORK	R _____
SCHEDULE 3: BUILDING AND STRUCTURAL REPAIRS	R _____
SUBTOTAL	R _____
PLUS 10% CONTINGENCY AMOUNT	R _____
VALUE-ADDED TAX (VAT) The tenderer shall add 15% of the subtotal for value-added tax	R _____
TENDER SUM CARRIED TO FORM OF TENDER	**R** _____

SIGNED ON BEHALF OF TENDERER: ……..

ERWAT
EXCELLENCE IN WATER CARE

PROJECT NO: ERW202012/TNDR-001

WATERVAL WASTEWATER CARE WORKS: SUPPLY AND INSTALLATION OF 3200A RESIN ENCAPSULATED BUSBARS FOR AERATION BLOWERS PROJECT

C3 SITE INFORMATION

Waterval Wastewater Care Works is situated at Waterval Farm, Meadow Road, Klip River. The coordinates are 26°26'13.46"S, 28° 5'52.48"E.

This site is fenced off with access control and the Contract or shall be allowed a site office within the fenced area. The Contractor shall be allowed access only to Module 2 and Module 3 activated sludge reactors and blower house. Module 2 and Module 3 receive on average 65Mℓ/d each.

ERWAT
EXCELLENCE IN WATER CARE

PROJECT NO: ERW202012/TNDR-001

WATERVAL WASTEWATER CARE WORKS: SUPPLY AND INSTALLATION OF 3200A RESIN ENCAPSULATED BUSBARS FOR AERATION BLOWERS PROJECT

C4 SCOPE OF WORK

C4.1 STANDARD SPECIFICATIONS

The standard specifications on which this contract is based are the **South African Bureau of Standards.**

Although not bound in nor issued with this Document, the following Sections of the Standardized Specifications shall form part of this Contract:

1. SANS 1195:2010 - Bus bars
2. SANS 60439-2:2006 - Low-voltage switchgear and control gear assemblies Part 2: Particular requirements for busbar trunking systems (busways)
3. SANS 61439-6:2012 - Low-voltage switchgear and control gear assemblies Part 6: Busbar trunking systems (busways)
4. Occupational Health and Safety Act, including all and most recent regulations

C4.2 PROJECT SPECIFICATIONS: A GENERAL

PS-1 GENERAL
PS-2 PROJECT DESCRIPTION: SCOPE OF WORK
PS-3 CONSTRUCTION AND MANAGEMENT REQUIREMENTS
PS-4 CONSTRUCTION PROGRAMME
PS-5 SITE FACILITIES AVAILABLE
PS-5.1 CAMPSITE AND STORE ROOM
PS-5.2 WATER, ELECTRICITY AND SEWERAGE
PS-6 CONTRACT NAME BOARDS
PS-7 AVAILABLE CRANE
PS-8 SECURITY
PS-9 SITE TO BE KEPT CLEAN
PS-10 FACILITIES TO OTHER CONTRACTORS
PS-11 SUB-CONTRACTORS
PS-12 PROTECTION OF EXISTING INFRASTRUCTURE AND EQUIPMENT
PS-13 TESTING AND QUALITY CONTROL
PS-14 CERTIFICATES OF PAYMENT
PS-15 CONSTRUCTION IN RESTRICTED AREAS
PS-16 DRAWINGS

PS-1 GENERAL

Installation of new Siemens aeration compressors at Waterval Wastewater Care Works (Modules 2 and 3) was completed in July 2019. After the installation was completed and the new aeration compressors had been running for approximately six months, a cable fault occurred on the cables feeding the new blower MCC in January 2020.

The cables were dug up and it was found that a critical fault had occurred on one of the phases. An emergency repair had to be done due to the aeration compressors being an integral part of the

biological process of the treatment works. The existing cables were disconnected and rerouted inside the blower house, temporarily positioned on the floor. Some damaged cables were repaired and cables that were still intact were re-used. The emergency repair and cable position had always been a temporary solution.

Based on various factors including but not limited to ambient temperature, corrosive environment and heavy load, it was decided to replace the cables with new resin encapsulated aluminium busbars.

Contractors shall plan the Works such that any one module has a downtime of maximum **12 Hours at a time**, thus manually operational within **12 Hours shall be a strict requirement in accordance with the requirements of Additional Specification SC: General Decommissioning, Testing and Commissioning Procedures.**

PS-2 PROJECT DESCRIPTION: SCOPE OF WORK

PS 2.1 WATERVAL WASTEWATER CARE WORKS: SUPPLY AND INSTALLATION OF 3200A RESIN ENCAPSULATED BUSBARS FOR AERATION BLOWERS PROJECT

The Scope of Work includes the supply and installation of equipment and infrastructure for two new busbar routes, all inside the Blower House, connecting Feeder 1 to Incomer 1 and Feeder 2 to Incomer 2 with all ancillary plant work for ERWAT Waterval Wastewater Care Works, Modules 2 and 3, including:

- Manufacture, supply and Install new resin encapsulated aluminium busbars to accommodate electrical load of five Siemens Aeration Compressors (5 x 400kW each) between Feeder (Old) MCC and Incomer (New) MCC;
- Install all mounting brackets, cable ladders for flexible leads and all necessary methods of earthing for busbar connection;
- Decommissioning, disconnection and removal of all existing supply cables in a staged manner to ensure maximum continued operation;
- Termination on new flexible leads to existing Feeder and Incomer MCC's;
- Modifications to the air inlet plenum Eastern wall to allow busbar access inside plenum and to Incomer MCC;
- Modification to the air inlet plenum door position to accommodate busbars running against the Blower house Northern wall;
- Testing and commissioning of the installation with COC certificate from qualified master electrician.
- Sealing of existing openings in walls with a non-shrink grout.
- Remove existing door and install new galvanized door in the plenum
- Minor building and structural work in order to install the door in the plenum
- Core drilling for the installation of the Busbars where required.
- Testing and commissioning of the installation with Certificate of Compliance from qualified Master Electrician.
- Permanent sealing of existing cable openings in walls with a non-shrink grout.
- Safeguarding all materials removed from the existing installation and delivery to safe storage on site, within existing material and equipment sheds, to be indicated by the Employer at the time of removal.
- Complying with all Occupational Health and Safety standards in terms of the Construction

Regulations 2014

- Planning and managing the Works in such a manner to allow for the continued operation of aeration blowers, save for the two allowed shutdown periods of 12 hours each, respectively for Installation A and Installation B, assuming that all Work will be done while accommodating the Employer's Operations and Maintenance personnel going about their routine work, as well as accommodating other contractors that may be required to complete work within the same space.

PS-3 CONSTRUCTION AND MANAGEMENT REQUIREMENTS

The Contractor shall be responsible for the construction works as contained in the Scope of Work and as set out in the Bill of Quantities and as per relevant specification. The Contractor shall be responsible for all management to execute the Scope of Work.

PS-4 CONSTRUCTION PROGRAMME

When drawing up his installation programme, the Contractor shall take into account the time for completion for each portion of the work. If the programme submitted by the Contractor in terms of Clause 5.6. of the General Conditions of Contract, has to be revised because the Contractor is falling behind in his programme, he shall submit a revised programme of how he intends to regain lost time to ensure practical completion of the work of each portion, and completion of the Works within the periods stipulated in the Contract Data or within a granted extension of time. Proposals to increase the tempo of work must incorporate positive steps to increase production either by more labour and plant on the Site, or by using the available labour and plant in a more efficient manner.

Instructions by the Engineer to expedite progress shall not be the subject of additional compensation to the Contractor unless the instruction explicitly states that the Contractor is entitled to additional compensation and cites the amount of such compensation or the basis on which it is to be determined.

Failure on the part of the Contractor to submit or to work according to the programme or revised programmes shall be sufficient reason for the Engineer to take steps as set out in Clause 9.2 of the General Conditions of Contract.

The approval by the Engineer of a programme shall have no contractual significance other than that the Engineer will be satisfied if the work is carried out according to the programme. The said approval will not limit the right of the Engineer to instruct the Contractor to vary the programme if necessary.

The Contractor shall organise his work in such a manner as to cause the minimum inconvenience to the Employer's personnel and operations. As a guideline, the following Installation and Commissioning Programme is proposed, which is aimed at installing the busbars in such a manner as to cause the smallest possible hindrance to access and escape routes.

INSTALLATION

There are two MCC's in the Blower house, an old MCC which shall hereafter be called the Feeder MCC and a new MCC which shall hereafter be called the Incomer MCC.

The new Blower MCC has two Incomers namely: Incomer_1 and Incomer_2. Incomer_1 power Blower_1 and Blower_2. Incomer_2 powers Blower_4 and Blower_5. Blower_3 can be powered from either of the Incomers as the situation requires.

The current restricted mode of operation due to the emergency repair allows either Blower_4 or Blower_5 to operate using Incomer 2, but not both at once. Blower_1, Blower_2 and Blower_3 are powered using Incomer 1. Thus, the installation shall be done in three parts.

PRE-INSTALLATION – Preparation and modifications to existing infrastructure

1. Prepare blower house for the installation of Busbar_1 and Busbar_2: clean installation area, remove obstructions and reposition existing infrastructure such as cables and cable ladders if needed, while maintaining live electrical / fully operational status.
2. Start installation process of fixing Busbar_1 and Busbar_2 to walls and roof of blower building with mounting brackets without disruption of the existing installation.
3. Make modifications to plenum Eastern wall to allow Busbar_1 and Busbar_2 to enter plenum, move plenum door and re-seal the plenum.
4. Complete installation of entire route of Busbar_1 and Busbar_2 for Incomer_1 and Incomer_2 except critical parts that can only be installed once Incomer_2 is shut down.

INSTALLATION A – Busbar_2 Connection between Feeder 2 and Incomer 2

Basis of installation A: Incomer 2 can power three blowers namely: Blower_4, Blower_5 and Blower_3. Since the cable fault, feeder 2 can only power one blower under the current repair conditions, Incomer_2 will therefore be disconnected first. This condition will allow Incomer_1 to operate normally, powering three blowers while terminations of Busbar_2 are made at Feeder_2 and Incomer_2. Once all connections are successfully terminated and Blower_4 and Blower_5 are operational, Incomer _1 can be shut down. The supply to Blower_3 will then be switched from Incomer_1 to Incomer_2.

1. Shut down Incomer_2, disconnect all existing cables from Feeder_2, remove from direct working area.
2. Terminate all new cables from Busbar_2 to Feeder_2 and Incomer_2 MCC's.
3. Complete all testing and commissioning of Busbar_2.
4. Restore power to Incomer_2.
5. Start-up Blower_4
6. Shut down Blower_3
7. Start-up Blower_5
8. Change power supply of Blower_3 to Incomer_2.
9. Remove all cables from Feeder_2 from Blower house and transport to ERWAT stores on site.

At the end of **Installation A** Blowers 3, 4 and 5 are operational and powered by Incomer_2. Blowers 4 and 5 are supplying module 3 with oxygen while Blower_3 is supplying module 2.

INSTALLATION B – Busbar_1 Connection between Feeder 1 and Incomer 1

Basis of installation B: During this phase Incomer_2 is fully operational and powering Blower_3, Blower_4 and Blower_5. Incomer_1 is shut down and safe to work on.

1. Disconnect all existing cables at Feeder_1 and Incomer_1.
2. Terminate all new cables from Busbar_1 to Feeder_1 and Incomer_1 MCC's, while removing cables from blower house and deliver to ERWAT stores on site.
3. Complete all testing and commissioning of Busbar_1.
4. Restore power to Incomer_1.
5. Start-up Blower_1
6. Shut down Blower_3
7. Start-up Blower_2
8. Provide certificate of Compliance for the entire installation.

NOTE: ERWAT operations shall be responsible for start-up and shut down of all blowers.

PS-5 SITE FACILITIES AVAILABLE

PS-5.1 CAMPSITE AND STORE ROOM

(a) Waterval Wastewater Care Works

A Site Establishment area is available and will be indicated to the Contractor. The Contractor must provide his own establishment facilities on site.

An existing shed is available for storage of bulk materials, but no service buildings may be used for storage. The Contractor must provide his own storeroom facilities for the duration of the Contract, for all high-tech and sensitive equipment and materials.

The facilities must comply with the South African National Building Regulations and all applicable Standards in all aspects.

PS-5.2 WATER, ELECTRICITY AND SEWERAGE

(a) Water supply

Water will be available free of charge but wastage will not be tolerated. Water will be available at specific points not necessarily adjacent to working areas. The Contractor must make his own arrangements for water supply to the working areas. The Contractor must supply his own standard fittings to couple up at the points where water is available.

The usage of water by the Contractor will be measured. The Contractor shall supply metering devices. In case of water shortages the Contractor will be responsible to make his own arrangements until such water shortages are resolved and reinstated to the Contractor.

In the event that water is not available on site, the Contractor shall supply at his own cost water for the execution of the Works.

(b) Electrical power supply

Electrical power supply is available on the Site and will be free of charge. The Contractor must make his own arrangements for a connection to the electrical power supply. The Contractor will be responsible, at his own cost, for the distribution of electricity for construction and domestic use. The usage of electricity by the Contractor will be measured. The Contractor shall supply metering devices. The electrical connection must comply with the applicable standards and the Contractor will be required to provide a certificate of compliance for any and all electrical connections.

PS-6 CONTRACT NAME BOARDS

Not required

PS-7 AVAILABLE CRANE

The existing blower house has an overhead crane manufactured by Condra with carrying capacity of 10 tonnes.

PS-8 SECURITY

(a) Restrictions on movement and limited access

The Contractor's personnel, vehicles and equipment will be restricted to areas of construction only. The Contractor shall comply with any requirements that the Engineer may have in this regard and shall take note that for security reasons the access to some areas, may be limited.

(b) Security check on personnel

The Employer may require the Contractor to have his personnel or a certain number of them security-classified, if so required by any competent authority.

In the event of the Employer or any competent authority requiring the removal of a person or persons from the site for security reasons, the Contractor shall do so forthwith and the Contractor shall thereafter ensure that such person or persons are denied access to the site and/or to any documents or information relating to the work. In such circumstances the Contractor shall indemnify the Employer and the Engineer and shall hold the Employer and the Engineer harmless against any and all claims of whatever nature arising.

c) Access cards to security areas

Should the work fall within a security area, the Contractor must obtain from the Engineer access cards for his security-cleared personnel and employees who work within such an area. The Contractor must comply with any regulations or instructions issued from time to time, concerning the safety of persons and property, by the Employer and/or SA Police services.

d) Safeguarding of plant, equipment and materials

The Contractor shall safeguard all plant, equipment and materials brough to site, against theft and vandalism, for the duration of the Works. The Contractor shall be responsible for appointing the necessary security guards to safeguard plant, equipment and materials from the time of delivery, until the time of Practical Completion.

PS-9 SITE TO BE KEPT CLEAN

During progress of the work and upon completion thereof, the Site of the Works shall be kept and left in a clean and orderly condition. The Contractor shall store materials and equipment for which he is responsible in an orderly manner, and shall keep the Site free from debris and obstructions.

All redundant materials, rubbish and waste arising from the work must be removed from the Site at the Contractor's cost and the site and buildings left clean and tidy.

PS-10 FACILITIES TO OTHER CONTRACTORS

In addition to the requirements of Clause 4.8.1 of the General Conditions of Contract the Contractor must make allowances for other Contractors on the Site. This may involve adapting his programme to accommodate the work of other contractors and ensuring access to their sites along prescribed routes over the Site of this Contract.

PS-11 SUBCONTRACTORS

In addition to the requirements of Clause 4.4 of the General Conditions of Contract, the Contractor shall be responsible for work carried out by subcontractors on his behalf. The Engineer will not liaise directly with such subcontractors. Problems related to payments, programming, workmanship, etc., shall be the responsibility of the Contractor and the subcontractor, and the Engineer will not become involved.

PS-12 PROTECTION OF EXISTING INFRASTRUCTURE AND EQUIPMENT

The work to be done will be carried out in locations and on parts of installations where there is existing and fully operational infrastructure.

The Contractor shall be responsible for ensuring that existing infrastructure is not damaged. All existing and relevant services must be surveyed, detected and indicated prior to the execution of each portion of the works. Damage to existing services must be repaired and or reinstated by the Contractor. All costs for the repair of damages to existing services shall be borne by the Contractor.

PS-13 TESTING AND QUALITY CONTROL

The Contractor shall engage the services of an approved independent laboratory or other institution as applicable for quality testing, to ensure that his work complies with the Specifications.

No separate payment will be made for such testing, the cost of which will be deemed to be included in the Contractor's rates bid for the items of work that require testing in accordance

with the Specifications, unless where specifically allowed for in the payment items referred to in the Bill of Quantities.

The onus to produce work that conforms in quality and accuracy of detail to the requirements of the Specifications and Drawings rests with the Contractor, and the Contractor shall, at his own expense, institute a quality-control system and provide experienced engineers, foremen, surveyors, materials technicians, other technicians and technical staff, together with all transport, instruments and equipment to ensure adequate supervision and positive control of the Works at all times.

The cost of supervision and process control, including testing carried out by the Contractor, will be deemed to be included in the rates bid for the related items of work.

The Contractor's attention is drawn to the provisions of the various Specifications regarding the minimum frequency of testing required. The Contractor shall, at his own discretion, increase this frequency where necessary to ensure adequate control.

On completion and submission of every part of the work to the Engineer for examination, the Contractor shall furnish the Engineer with the results of the relevant tests to indicate compliance with the Specifications.

PS-14 CERTIFICATES OF PAYMENT

The statement to be submitted by the Contractor in terms of Clause 6.10.1 of the General Conditions of Contract shall be prepared in accordance with the standard payment certificate prescribed by the Engineer and shall comprise at least two sets of A4-size paper copies.

All costs for the preparation and submission of the statements shall be borne by the Contractor.

A monthly report must be submitted with the statement for payment to the Engineer. This report shall be submitted electronically stating the details of all labour utilised on the project for the current month:

- Workers' full names
- Workers' ID Numbers
- Work performed by the workers
- Rate per hour/day
- Hours worked
- Total paid for month
- Date of Skills Development Training
- Date of Technical Skills Training

PS-15 CONSTRUCTION IN RESTRICTED AREAS

Working space will be restricted. The construction method used in these restricted areas largely depends on the Contractor's Plant. However, the Contractor must note that the rates and prices submitted will be deemed to include full compensation for difficulties encountered while working in restricted areas. Neither extra payment nor any claim for payment due to these difficulties will be considered.

PS-16 DRAWINGS

The Contractor will, in terms of Clause 5.9.1 of the General Condition of Contract, be provided free of charge with two paper prints of each drawing issued to him.

All information in the possession of the Contractor that is required by the Engineer's representative to complete the as-built drawings must be submitted to the Engineer's representative before a Certificate of Practical Completion will be issued.

Only figured dimensions shall be used and drawings shall not be scaled unless required by the Engineer. The Engineer will provide the dimensions that may have been omitted from the Drawings.

C4.3 PROJECT SPECIFICATIONS B: AMENDMENTS TO THE STANDARD AND PARTICULAR SPECIFICATION

The following variations and additions to the SANS 1200 Standard Specifications referred to in the last clause of Portion 1 apply to this Contract. The prefix PS indicates an amendment to SANS 1200. The letters and numbers following these prefixes respectively indicate the relevant Standardised Specification and clause numbers in SANS 1200.

PSA GENERAL

PSA 1 SCOPE
PSA 2 INTERPRETATIONS
PSA 2.3 DEFINITIONS
PSA 2.4 ABREVIATIONS
PSA 3 MATERIALS
PSA 3.1 QUALITY
PSA 3.3 ORDERING OF MATERIALS
PSA 4 PLANT
PSA 4.2 CONTRACTOR'S OFFICE, STORES AND SERVICES
PSA 5 CONSTRUCTION
PSA 5.4 PROTECTION OF OVERHEAD AND UNDERGROUND SERVICES
PSA 5.4.1 Location of existing services
PSA 8 MEASUREMENT AND PAYMENT
PSA 8.1 MEASUREMENT
PSA 8.1.2 Preliminary and general items or section
PSA 8.2 PAYMENT
PSA 8.2.1 Fixed-charge and value-related items
PSA 8.2.2 Time-related items
PSA 8.8 TEMPORARY WORKS

PSA GENERAL

PSA 1 SCOPE

REPLACE SUBCLAUSE 1.1 WITH THE FOLLOWING:

"1.1 This specification covers requirements, principles and responsibilities of a general nature that are normally applicable to all Civil Engineering Contracts, as well as the requirements for the Contractor's establishment on the Site."

PSA 2 INTERPRETATIONS

PSA 2.3 DEFINITIONS

(a) General

ADD THE FOLLOWING DEFINITIONS:

"General conditions: The General Conditions of Contract specified for use with this Contract, and the Contract Data.

Specified: As specified in the standardised and standard specifications, the Drawings or the Scope of Work.

Permanent Works: as defined in Clause 1.1.1.22 of the General Conditions of Contract shall for the purpose of this Contract, be regarded as the construction work."

(b) Measurement and payment

REPLACE THE DEFINITIONS FOR "fixed charge", "time-related charge" AND "value-related charge" WITH THE FOLLOWING:

"Fixed charge: A charge that is not subject to adjustment on account of variation in the value of the Contract price or the Contract Time of Completion.

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

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

PSA 2.4 ABBREVIATIONS

(a) Abbreviations relating to standard documents

ADD THE FOLLOWING ABBREVIATION:

"CKS: SANS Co-ordinating Specification."

PSA 3 MATERIALS

PSA 3.1 QUALITY

ADD THE FOLLOWING:

"All manufactured materials supplied shall be new materials unless the contrary is specified. All materials specified in accordance with SANS Specifications shall bear the SANS mark, whether so specified or not."

ADD THE FOLLOWING SUBCLAUSE:

"PSA.3.3 ORDERING OF MATERIALS

The quantities set out in the Bill of Quantities have been carefully determined from calculations based on data available at the time and should therefore be considered to be approximate quantities only. Before ordering materials of any kind the Contractor shall check with the Engineer whether or not the scope of the work for which the materials are required is likely to change substantially. No liability or responsibility whatsoever shall be attached to the Employer for materials ordered by the Contractor except when ordered in accordance with written confirmation issued by the Engineer."

PSA 4 PLANT

PSA 4.2 CONTRACTOR'S OFFICES, STORES AND SERVICES

ADD THE FOLLOWING PARAGRAPH BEFORE THE FIRST PARAGRAPH:

"The Contractor's construction camp shall be fenced off and shall contain all offices, stores, workshops, testing laboratories, toilet facilities, etc. The camp shall always be kept in a neat and orderly condition.

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

ADD THE FOLLOWING TO THE SECOND PARAGRAPH:

"One chemical toilet per 10 workmen shall be provided and must be screened from public view and its use shall be enforced.

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

PSA 5 CONSTRUCTION

PSA 5.4 PROTECTION OF OVERHEAD AND UNDERGROUND SERVICES

REPLACE THE HEADING AND THE CONTENTS OF THIS SUBCLAUSE WITH THE FOLLOWING:

LOCATION AND PROTECTION OF EXISTING SERVICES

PSA 5.4.1 Location of existing services

Before underground or excavation work is carried out, the Contractor shall ascertain the presence and position of all services likely to be damaged or interfered with by his activities. He shall obtain up-to-date plans from the Engineer for this purpose, showing the position of services in the area where he intends to work.

As services can often not be reliably located from such plans, the Contractor shall determine the exact position of such services by means of suitable detecting equipment and afterwards by careful hand excavation where necessary in order to expose the services at the positions of possible interference by his activities. This procedure shall also be followed in respect of services not shown on the plans but believed to be present.

All such services, the positions of which have been located at the critical points, shall be designated as 'known' services and their positions shall be indicated on a separate set of Drawings, a copy of which shall be furnished to the Engineer.

While he is occupying the Site, the Contractor shall be liable for all damage caused by him to known services as well as for consequential damage, whether caused directly by his operations or by the lack of proper protection.

PSA 8 MEASUREMENT AND PAYMENT

PSA 8.1 MEASUREMENT

PSA 8.1.2 Preliminary and general items or section

PSA 8.1.2.2 Tendered sums

REPLACE THE CONTENTS OF THIS SUBCLAUSE WITH THE FOLLOWING:

- Risks, costs and obligations in terms of the General Conditions of Contract, the Contract Data and of this Standardised Specification, except where provision is made in these Project Specifications to cover compensation for any of these items;
- Head-office and site overheads and supervision;
- Profit and financing costs;
- Expenses of a general nature not specifically related to any item or items of permanent or temporary work;
- Providing facilities on Site for the Contractor's personnel, including offices, storage facilities, workshops, ablutions, for providing services such as water, electricity, sewerage, sewage and rubbish disposal, for access roads and all other facilities required, as well as for the removal on completion of the Works of these facilities and the cleaning-up of the camp site on completion of the Works;
- Providing facilities for the Engineer and his staff as specified in SANS 1200 AB and in these Project Specifications"."

PSA 8.2 PAYMENT

PSA 8.2.1 Fixed-charge and value-related items

REPLACE THE CONTENTS OF THIS SUBCLAUSE WITH THE FOLLOWING:

"Payment of fixed charges in respect of item 8.3.1 will be made as follows:

Ninety per cent (90%) of the sum bid will be paid when the facilities have been provided and approved. The remaining 10% will be paid when the construction works have been completed, the Contractors portion of the facilities have been removed and the camp site has been cleared and cleaned.

PSA 8.2.2 Time-related items

REPLACE THE CONTENTS OF THIS SUBCLAUSE WITH THE FOLLOWING:

"Subject to the provisions of Sub clauses 8.2.3 and 8.2.4, payment under item 8.4.1 (time-related item) will be made monthly in equal amounts for each installation, calculated by dividing the sum bid for the item by the construction period for the installation in months, provided always that the total of the monthly amounts so paid for the item is not out of proportion with the progress of the work on the installation as a whole.

Should the Engineer grant an extension of Time for Completion of the works on the installation, the Contractor will be entitled to an increase in the sum bid for the time-related item, which increase shall be in the same proportion to the original sum bid as the extension of time is to the original Time for Completion of the works.

Payment of such increased amounts will be deemed full compensation for all additional time-related preliminary and general costs due to the circumstances pertaining to the extension of time granted for an installation. The length of the construction period for each installation is indicated in Part 1 of the Contract Data."

PSA 8.3 BILLED FIXED-CHARGE AND VALUE-RELATED ITEMS

REPLACE THE ITEMS WITH THE FOLLOWING:

"PSA 8.3.1 Fixed preliminary and general charges Unit : Sum

PSA 8.3.2 Value-related preliminary and general charges Unit : Sum

The sums bid shall include full compensation for all fixed and value-related preliminary and general charges as described in Subclause PSA 8.1.2.2. Payment will be made as described in Subclause PSA 8.2.1."

PSA 8.4 BILLED TIME-RELATED ITEMS

REPLACE THIS ITEM WITH THE FOLLOWING:

"PSA 8.4.1 Time-related preliminary and general charges:

(a) Busbar Installation ..... Unit: Month

The sums bid shall include full compensation for all time-related preliminary and general charges as described in Subclause PSA 8.1.2.2 for the installation of the Busbars on site that

excludes the manufacturing period. Payment will be made as described in Subclause PSA 8.2.2.

NOTE: The total amount bid for items PSA 8.3.1, PSA 8.3.2 and PSA 8.4.1 shall not exceed 15% of the total amount excluding value-added tax."

PSA 8.8 TEMPORARY WORKS

REPLACE ITEM 8.8.4 WITH THE FOLLOWING:

"PSA 8.8.4.1 Location and protection of existing services:

PSA 8.8.4.2 Provision of detecting devices for:

(a) Water and sewer pipes ..... Unit : No
(b) Electrical and other cables ..... Unit : No

The bid sums shall cover the cost of providing and operating suitable equipment for as long as it is needed to locate all the existing services likely to be affected by the construction activities. Including the protection and barricading of services for the required duration.

PSA 8.8.4.3 Hand excavation necessary for locating and exposing existing services in all material:

In roadways ..... Unit: m3

ADD THE FOLLOWING ITEMS:

"PSA 8.8.4.4 Additional tests:

(a) Additional tests required by the Engineer ..... Unit : PC Sum
(b) Attendance and profit ..... Unit : %

An amount has been allowed in the Bill of Quantities under sub item (a) to cover the cost of additional tests required by the Engineer. The Engineer will have the sole authority to spend the amount or part thereof.

The bid percentage under sub item (b) will be paid to the Contractor on the value of each payment made to the testing authority.

Note in connection with sub item (a):

The Contractor is responsible for both the cost of normal testing as described in Sub clause PS 8.10 in portion 1 of the Project Specifications and for the cost of any additional test that indicates that the Specifications have not been complied with.

PROJECT NO: ERW202012/TNDR-001

WATERVAL WASTEWATER CARE WORKS: SUPPLY AND INSTALLATION OF 3200A RESIN ENCAPSULATED BUSBAR SYSTEM FOR AERATION BLOWERS PROJECT

ERWAT
EXCELLENCE IN WATER CARE

C5 ADDITIONAL AND PARTICULAR SPECIFICATIONS

C 5.1 ADDITIONAL GENERAL AND STANDARD EMPLOYER SPECIFICATIONS

SC : General Decommissioning, Testing and Commissioning Procedures
SI : Health and Safety

C 5.2 PARTICULAR SPECIFICATIONS

PAB : Electrical Installations & Busbar Installations

ADDITIONAL SPECIFICATION

SC GENERAL DECOMMISSIONING, TESTING AND COMMISSIONING PROCEDURES

CONTENTS

SC 01 SCOPE

This specification encompasses all aspects of the repairs of systems and services that form part of an installation, including the factory and on-site testing, decommissioning, installation and commissioning of all equipment, instrumentation and materials reconditioned, supplied and installed as part of an installation as defined in The Scope of Work.

The specified procedures are the minimum requirements to be supplemented by various technical and particular specifications in this document. These requirements shall apply to all commissioning work scheduled as part of the installations, as well as recommissioning work that is part of the routine preventive and corrective maintenance.

SC 01.01 Occupational Health and Safety Act

The Contractor shall be required to comply with the Occupational Health and Safety Act 85 of 1993, Construction Regulations 2014 and related regulations. Non-compliance with these regulations, in any way whatsoever, will be adequate reason for suspending the Works.

SC 02 PHASED REPAIRS AND UPGRADING OF THE INSTALLATION

When an installation consists of parallel systems or components, the complete installation and all its components shall be repaired without taking the complete installation out of commission at any time, unless otherwise specified in the Technical Specifications.

In order to schedule the repairs of an installation, all work shall be done in phases as specified in the Technical Specifications and illustrated in detail on the Drawings. Repairs of each part shall terminate with the successful recommissioning of that part.
Each part of an installation shall be decommissioned and recommissioned in the sequence specified in the Technical Specifications and on the Drawings.

The Contractor shall install all the necessary temporary specials, spool pieces, supporting frames, brackets, electrical cables and any other temporary equipment and materials to provide a functional link between each repaired and upgraded part of the installation and the parts that has not yet been repaired and upgraded during recommissioning.

Electrical and instrumentation Contractors and subcontractors shall ensure that the system remains operational as specified, using either existing or newly installed instruments, cables and controls.

Payment is based on the successful recommissioning of a specific part of the installation.

SC 03 **DETAILED COMMISSIONING PLAN**

No work of any kind on any part of the existing installation shall take place prior to the Engineer's approval of a detailed commissioning plan. This plan shall be submitted in addition to the general programme for planning and monitoring contract progress, at least two weeks prior to any programmed shutdown. The Contractor submits the detailed commissioning plan for approval by both the Engineer and the User Client. Commissioning plans shall take all process requirements into account. The detailed commissioning plan shall indicate all actions necessary for:

(1) Decommissioning
(2) Recommissioning of parts of the installation
(3) Commissioning of the installation.

All work deemed necessary for practical completion of the installation shall be indicated on the commissioning plan.

The plan includes a detailed programme which shall indicate the milestones to be achieved before shutdown and decommissioning as activities of zero duration, all of which shall be prerequisites linked to the "start" of decommissioning or shutdown.

The following specific actions shall be included in the detailed programme, clearly indicating the time allowed for:

(a) Communication, including the time for confirmation of the official shutdown.
(b) Draining parts of the installation to sumps, where available, or to other storage facilities provided by the Contractor;
(c) Installation of temporary spools blanked flanges, electrical cables, temporary equipment and materials or other means of isolation where necessary;

(d) Partial decommissioning and removal of existing material and equipment to perform work, including protection of pipework against hot work, cutting into pipework, loosening bolts, flanges, electrical and communication cable termination and all other work necessary for recommissioning;
(e) Installation of temporary functional links between any two parts of the installation;
(f) Each individual field weld, connections and terminations subject to the Engineer's approval;
(g) Non-destructive testing of materials, for manufacturing/construction quality and for producing test results;
(h) Installation of all instruments and their connection to SCADA systems;
(i) Detailed tests to confirm the performance of specific equipment, including calibration of all instruments;
(j) Installation and connection of all power and communication cables;
(k) De-aeration of all pipe sections;
(l) Communication between the Contractor, the Engineer, the Employer and the User Client;
(m) Start-up of the complete system, indicating start-up procedures.

Inspection of the prefabricated installation, testing of all equipment and materials prior to final commissioning, pressure testing and non-destructive testing shall be clearly scheduled in the project progress programme.

The detailed commissioning plan clearly indicates the responsible technical staff, with their relevant qualifications and trade skills against each of the tasks on the programme.

The detailed commissioning plan also indicates the methodology for testing, calibration and certifying functional compliance for each component forming part of the installation.

Day 30 tests and instruction/training sessions with the User Client shall be scheduled in the project progress programme.

The Contractor shall submit commissioning checks sheets to the Engineer at least three weeks before the commissioning period commences, for all the equipment supplied, reconditioned and installed by the Contractor. The Contractor shall complete the commissioning sheets during the commissioning period and all items listed shall be entered.

Programmes for the Day 1 tests, Day 30 tests and instruction/training sessions with the User Client's operators and maintenance team shall be prepared by the Contractor and submitted to the Engineer at least two weeks before the commissioning period commences.

SC 04 **COMMISSIONING COMMUNICATION CHANNELS**

The Contractor shall communicate with the User Client's operating and maintenance managers via the Engineer to finalise start-up after decommissioning in accordance with the specified procedures.

The following key parties shall be involved before and during shutdown and decommissioning of any part of the system:

Contractor: Site Agent
Engineer: Engineer Representative
Employer: Representative of Area Manager
User Client: Operating and Maintenance Manager.

SC 05 COMMISSIONING RISK CONTROL AND PENALTIES

(a) The safety instructions stipulated by the Occupational Health and Safety Act 85 1993 (Act 85 of 1993) shall be adhered to at all times.
(b) The Contractor shall not be allowed to work on any part of the installation without obtaining a commissioning check permit on the day of shutdown.
(c) Payment reductions for exceeding the maximum permissible down-time during shutdown and commissioning shall apply as stipulated in the General Conditions of Contract and the Contract Data.

SC 06 DELAYS OF SCHEDULED SHUTDOWNS

Specific dates on which an installation shall be shut down for decommissioning shall be finalised during coordination meetings of all the parties involved, including the Engineer, the Employer, the User Client and the Contractor.

Although a date for each shutdown will be scheduled at the coordination meetings, the actual date of the shutdown shall be determined by the process requirements and user demands, allowing for a window of seven (7) calendar days from the date of the planned shutdown.

Prospective bidders shall make allowances in their bid rates for the shutdown to occur at any time during this seven-day period. No additional payment shall be due if the shutdown occurs within this seven-day period.

If the Contractor fails to commence with the shutdown and decommissioning of the installation within the scheduled period, all additional costs arising from the shutdown at a later stage shall be for the Contractor's account.

SC 07 MATERIAL AND EQUIPMENT PROCUREMENT AND PROTECTION

It is the responsibility of the Contractor to ensure the functionality of all units of new equipment prior to decommissioning, before installation of any specific part of the system. If the equipment, whether free-issued or not, does not conform to the functionality specifications during pre-installation testing, the Contractor shall notify the Engineer in writing without delay.

SC 08 **TESTING OF EQUIPMENT PRIOR TO RECOMMISSIONING**

The equipment shall be tested for functionality after pre-installation of equipment in parts of the installation.

(a) The Contractor shall inform the Engineer well in advance of his intention to perform the first tests and start-up of equipment in order to allow a representative of the Engineer to witness the tests. The extent of all pre-commissioning tests and checks shall be agreed with the Engineer prior to commencement, as scheduled in the Detailed Commissioning Plan.

(b) The Contractor shall first conduct his own tests of all the equipment and individual components forming part of an installation. When he is satisfied that the equipment complies with the specifications, he shall notify the Engineer that he is ready for the official pre-commissioning tests on completion. The Contractor shall not conduct an official test without the Engineer's presence or approval. All equipment shall conform to the specified requirements.

(c) Before starting up any part of the installation or filling the tanks or pipes sumps, the Contractor shall clean out the tanks, pipes, fittings, equipment or structures and, if necessary, make arrangements with other Contractors to remove their building rubble from the structures, check that all safety devices and alarms have been set and activated, all nuts have been tightened correctly, that all the equipment is complete and ready for start-up, that the plant has been installed correctly, and that copies of the operating manuals have been handed to the Engineer.

(d) The Contractor shall start up each section of equipment after ensuring that oil fillings, lubrication, vibration monitoring, cable termination and so on have been correctly completed. He is also responsible for the first refilling of all lubricating oils and for adjusting the plant to operate according to the specifications. Before any equipment is started or energised, the Contractor shall ensure that it is safe in terms of the personnel and equipment on the site to do so. The Contractor's tendered rates and sums shall allow for these costs.

All equipment shall be tested according to the relevant specifications that form part of this document.

No shutdown or decommissioning of any part of the system shall take place unless all the equipment to be installed have been tested by the Contractor and approved by the Engineer.

SC 09 **TESTING OF MATERIAL AND EQUIPMENT SPECIFICATIONS AND WORKMANSHIP**

All results of the required non-destructive, pre-commissioning functionality and manufacturing testing shall be submitted to the Engineer well in advance of testing the equipment on recommissioning. All such test results shall be submitted before Day 1 commissioning tests.

SC 10 DECOMMISSIONING

The decommissioning period shall commence on the instant of the entire system shutdown. The recommissioning period shall start in parallel with decommissioning.

Shutdown and decommissioning shall not proceed without compliance with all the milestones in the detailed commissioning programme. The list of milestones in this document is not complete but indicates the minimum requirements. Milestones to be achieved prior to shut-down and decommissioning may be added to the programme at the Engineer's discretion.

The Contractor is responsible for the safe decommissioning of all material, equipment, components and instrumentation to avoid damage to parts or components of the installation.

SC 11 RECOMMISSIONING, COMMISSIONING AND COMPLETION OF INSTALLATIONS

SC 11.01 RECOMMISSIONING

Recommissioning means the commissioning of all sections or systems that form part of the installation to meet the required functional specifications for the individual section or system prior to commissioning of the repaired and upgraded installation.

The Contractor is responsible for the recommissioning of all parts of the installation and he shall perform the tasks listed below.

(a) Prior notice shall be given to and proper arrangements shall be made for recommissioning with the Employer, the Engineer, the User Client and the suppliers of equipment that is affected by recommissioning and testing.
(b) If plant and equipment supplied by others are to be commissioned, the supplier's specific permission together with all requirements related to commissioning shall be obtained prior to recommissioning without in any way altering the General Conditions of Contract and the Contract Data with reference to the Contractor's liability in terms of defects.
(c) The new and reconditioned parts of the installation shall be thoroughly inspected by a responsible representative of the Contractor to ensure that manufacture/construction and installation work have been completed according to the specifications.

SC 11.02 COMMISSIONING AND COMPLETION OF REPAIRS AND UPGRADING WORK

Commissioning means commissioning of the repaired and upgraded installation(s) to perform in perfect working order.

(a) The commissioning period for each installation:
    (i) Commences with the Day 1 tests of the complete repaired and upgraded installation;

(ii) Includes commissioning of all components, equipment, sections and sub-systems that have been recommissioned prior to the Day 1 tests;

(iii) Includes training of the User Client's operating personnel and the maintenance teams;

(iv) Terminates with a Day 30 test in compliance with the commissioning report.

(b) The purpose of the Day 1 tests is to ensure that:

(i) The electronic, electrical and mechanical equipment and materials are functional and in perfect working order with respect to each other and the installation as a whole;

(ii) The commissioning period, including training, commences on successful completion of the Day 1 tests;

(c) Complete commissioning of installations as part of the system as a whole shall be undertaken over a trouble-free period up to Day 30. During this period the Contractor shall train the User Client's operators and his maintenance team for operating and maintaining the installation. This training shall allow for all possible operational conditions, including emergency conditions, the correct servicing of every part, the type of oil or grease to be used, and similar tasks. The training shall take place by means of demonstrations, and the operating and maintenance manuals shall be referred to for this purpose.

(d) Day 30 commissioning tests shall be performed thirty calendar days after the successful completion of the Day 1 tests. The commissioning period of the installation terminates upon the successful completion of the Day 30 commissioning tests:

(i) The Contractor shall be entitled to a certificate of Practical Completion for the repairs and upgrading of the installation only upon successful completion of the Day 30 commissioning tests;

(ii) The Contractor becomes responsible for maintenance of the installation upon Practical Completion and is entitled to performance-based payments in compliance with Additional Specification SA: General Maintenance, until Project Completion.

(e) The Contractor shall conduct all the tests required to satisfy the Engineer that the installation is performing according to specification, and shall make allowance for these tests in his bid rates and prices. These tests shall be conducted to certify that the installation, as repaired, upgraded and installed, is in perfect working order in terms of the specified functional requirements. The Contractor shall note that all equipment is to be tested as part of an installation, where appropriate, and will not be passed if all protection devices, interlocking with other equipment, etc, are not fully functional. No completion certificate will be issued for an installation of which the equipment has incomplete commissioning reports. Information that is not available or applicable, or instances where certain tests have not been carried out, are subject to the Engineer's decision.

(f) Commissioning of a system (which includes the thirty days between the Day 1 and Day 30 tests) includes operating under conditions that adequately prove that all the specifications have been met. All safety devices, standby plant, automatic controls, manual controls and human interventions and all protection devices shall

be adequately tested for reliability and correct functioning. The Contractor may be called upon to repeat testing during the maintenance period if the performance of the equipment is suspected to be substandard. Costs related to such tests shall be for the Contractor's account and shall comply with the specified requirements. Copies of updated commissioning reports shall be provided to the Engineer within two days after a test has been performed.

(g) The Contractor is responsible for providing all labour and materials (including testing equipment) during the commissioning period and shall carry out all the servicing and adjustments to ensure that the installation operates as specified. Valid calibration certificates shall be available for all testing equipment on the site during the commissioning period.

(h) The Contractor shall provide weekly updates of the detailed commissioning programme and schedule.

(i) It shall be an express Condition of the Contract that if any equipment fails during the commissioning period, the equipment shall be repaired or replaced by the Contractor, and testing and commissioning shall commence from scratch.

SC 12 PROJECT PARTICULARS: DEFINITION OF INSTALLATIONS AND SYSTEMS

The installations as defined below shall be commissioned in accordance with all technical and particular specifications, manufacturer's instructions, construction drawings and diagrams:

SC 12.1 NOTE:

The Contractor shall organise his work in such a manner as to cause the minimum inconvenience to the Employer's personnel and operations. As a guideline, the following Installation and Commissioning Programme is proposed, which is aimed at installing the busbars in such a manner as to cause the smallest possible hindrance to access and escape routes.

INSTALLATION

There are two MCC's in the Blower house, an old MCC which shall hereafter be called the Feeder MCC and a new MCC which shall hereafter be called the Incomer MCC.

The new Blower MCC has two Incomers namely: Incomer_1 and Incomer_2. Incomer_1 powers Blower_1 and Blower_2. Incomer_2 powers Blower_4 and Blower_5. Blower_3 can be powered from either of the Incomers as the situation requires.

The current restricted mode of operation due to the emergency repair allows either Blower_4 or Blower_5 to operate using Incomer 2, but not both blowers at once. Blower_1, Blower_2 and Blower_3 is powered using Incomer 1. Thus, the installation shall be done in three parts namely the Pre-Installation, Installation A, and Installation B.

PRE-INSTALLATION – Preparation and modifications to existing infrastructure

a) Prepare blower house for the installation of Busbar_1 and Busbar_2: clean installation area, remove obstructions and reposition existing infrastructure like cables and cable ladders if needed, while maintaining live electrical / fully operational status.

b) Start installation process of fixing Busbar_1 and Busbar_2 to walls and roof of blower building with mounting brackets without disruption of the existing installation.
c) Make modifications to plenum Eastern wall to allow Busbar_1 and Busbar_2 to enter plenum, move plenum door and re-seal the plenum.
d) Complete installation of entire route of Busbar_1 and Busbar_2 for Incomer_1 and Incomer_2 except critical parts that can only be installed once Incomer_2 is shut down.

INSTALLATION A – Busbar_2 Connection between Feeder 2 and Incomer 2

Basis of installation A: Incomer 2 can power three blowers namely: Blower_4, Blower_5 and Blower_3. Since the cable fault, feeder 2 can only power one blower under the current repair conditions, Incomer_2 will therefore be disconnected first. This condition will allow Incomer_1 to operate normally, powering three blowers while terminations of Busbar_2 are made at Feeder_2 and Incomer_2. Once all connections are successfully terminated and Blower_4 and Blower_5 are fully tested and operational, the supply to Blower_3 can then be switched from Incomer_1 to Incomer_2. With Blower_3, Blower_4 and Blower _5 now operational and powered by Incomer_2, Incomer _1 can be shut down.

a) Shut down Incomer_2, disconnect all existing cables from Feeder_2, remove from direct working area.
b) Terminate all new cables from Busbar_2 to Feeder_2 and Incomer_2 MCC's.
c) Complete all testing and commissioning of Busbar_2.
d) Restore power to Incomer_2.
e) Start-up Blower_4
f) Shut down Blower_3
g) Start-up Blower_5
h) Change power supply of Blower_3 to Incomer_2.
i) Remove all cables from Feeder_2 from Blower house and transport to ERWAT stores on site.

At the end of **Installation A** Blowers 3, 4 and 5 are operational and powered by Incomer_2. Blowers 4 and 5 are supplying module 3 with oxygen while Blower_3 is supplying module 2.

INSTALLATION B – Busbar_1 Connection between Feeder 1 and Incomer 1

Basis of installation B: During this phase Incomer_2 is fully operational and powering Blower_3, Blower_4 and Blower_5. Incomer_1 is shut down and safe to work on.

a) Disconnect all existing cables at Feeder_1 and Incomer_1.
b) Terminate all new cables from Busbar_1 to Feeder_1 and Incomer_1 MCC's, while removing cables from blower house and deliver to ERWAT stores on site.
c) Complete all testing and commissioning of Busbar_1.
d) Restore power to Incomer_1.
e) Start-up Blower_1
f) Shut down Blower_3
g) Start-up Blower_2

h) Provide certificate of Compliance for the entire installation.

NOTE: ERWAT operations shall be responsible for start-up and shut down of all blowers.

SC 13 MEASUREMENT AND PAYMENT

SC 13.01 DECOMMISSIONING AND REMOVING PARTS OF INSTALLATIONS.....Unit: sum

The unit of measurement shall be a sum.

The sum bid shall include full compensation for all actions and labour required for shutdown and decommissioning of the entire installation as specified to enable decommissioning and removal of installations as listed in the Bill of Quantities.

The sum bid shall include full compensation for the decommissioning and removal of the parts and components of an installation as listed individually in the Bill of Quantities, including actions and/or costs resulting from such work, to enable the recommissioning of parts of the repaired and/or upgraded installation.

The sum bid shall include full compensation for final dismantling of decommissioned materials and equipment and the removal of all such items to stores on site, as directed by the Engineer.

SC 13.02 COMMISSIONING AND TESTING PARTS OF AN INSTALLATION……. Unit: sum

The unit of measurement shall be a sum.

The sum bid shall include full compensation for commissioning and testing parts of the installation to be operational while still incomplete in relation to the entire repaired and/or upgraded system.

Separate payment items shall be billed for separate parts of installations that comprise the complete system as a whole.

SC 13.03 COMMISSIONING AND TESTING OF INSTALLATIONS THAT COMPLETE A SYSTEM AS A WHOLE ……. Unit: sum

The unit of measurement shall be a sum.

The bid sum shall include full compensation for commissioning of the installations specified and listed as part of the system as a whole and for all costs and expenses related to labour, removal, repair, reinstallation and testing of material components and equipment during the commissioning period for each part of the system. The bid sum shall include full compensation for the final commissioning and testing, including Day 1

and Day 30 tests and all work during the 30 day commissioning period of all parts and components of the system to the specified functional condition.

All work, handling of temporary live electrical cables, lock-out and tag out procedures, temporary diversion of flows and all safety requirements shall be included in the bid sum. All actions for on-site testing, sampling, analysis, logging of data and recording of results shall be covered under the costs for commissioning. The contractor shall also be responsible for assisting the client with operation of the system during the commissioning period, all related costs deemed included with the bid sum.

Payment shall be based on successful completion of the Day 30 tests.

SC 13.04 **QUALIFIED MILLWRIGHT** …….Unit: Month

The unit of measurement shall be the number of months the skilled tradesman will be Responsible and involved with the commissioning duties, working on all installations simultaneously. . The tendered rate shall include full compensation for all temporary commissioning equipment and tools that may be required for the millwright's work during commissioning. The tendered rate shall include full compensation for all subsistence, travelling, overhead and other related charges.

SC 13.05 **REGISTERED SENIOR PROCESS CONTROLLER**.....Unit: Month

The unit of measurement shall be the number of months the registered Class V Process Controller (Water and Wastewater Treatment Plants) will be Responsible and involved with the commissioning duties, working on all installations simultaneously, to ensure that the water quality is obtained along different stages of the process train as detailed in the technical specifications and the process flow diagrams. The tendered rate shall include full compensation for all temporary on-site analytical equipment and tools that may be required for the process controller's work during commissioning. The tendered rate shall include full compensation for all subsistence, travelling, overhead and other related charges.

ADDITIONAL SPECIFICATION

SI OCCUPATIONAL HEALTH AND SAFETY
CONTENTS

SI 1 DEFINITIONS

In this document the following expressions shall bear the meanings assigned to them below:

Agent

Means a competent person who acts as a representative for a Client;

Client

Means any person for whom construction work is being performed [***i.e. Erwat***] for purposes of this specification;

COID ACT

Means the Compensation of Occupational Injuries and Diseases Act and Regulations, Act 130/1993

Construction Regulations

Means the Occupational Health and Safety Act's, No 85 of 1993, R 84 of February 7, 2014 Construction Regulations that came into effect on February 7, 2014;

Occupational Health and Safety Plan

Means a documented plan, which addresses hazards identified and includes safe working procedures to mitigate, reduce or control the hazards identified;

Occupational Health and Safety specification

Means a documented specification of all Health and Safety requirements pertaining to the associated works on a construction site, so as to ensure the Health and Safety of persons working, visiting, passing, staying and/or working close to the site;

OHS ACT

Means the Occupational Health and Safety Act and Regulations, Act 85 of 1993, as amended;

Principal Contractor

Means an employer, as defined by section 1 of the OHS Act who performs construction work and is appointed by the Client to be in overall control and management of the construction site and works.

SI 2 INTRODUCTION

In terms of Construction Regulation 5 (1) (b) of the OHS Act, the Client is required to compile an Occupational Health and Safety Specification for any intended project and provide such specification to prospective tenderers.

This specification has as objective to ensure that the Principle Contractor entering into a contract with the Client achieves and maintains an acceptable level of Occupational Health and Safety performance and compliance. This document forms an integral part of the contract between the Client and the Principal Contractor and the Principal- and other contractors should make it part of any contract/s that they may have with other contractors and/or suppliers as far as this project is concerned.

Compliance with this document does not absolve the Principal Contractor from complying with any other minimum legal requirements and the Principal Contractor remains responsible for the Health and Safety of his employees, those of his mandataries as well as any persons on adjacent properties as far as it relates to the construction activities.

Standing time claims related to any health & safety matter will not be entertained.

SI 3 SCOPE

To develop a project specific Occupational Health and Safety specification that addresses the reasonable and foreseeable risks, exposures and aspects of Occupational Health and Safety as affected by the abovementioned contract work.

The specification will provide the requirements that the Principal Contractor and other contractors will have to comply with in order to reduce the risks associated with the abovementioned contract work and that may lead to incidents causing injury and/or ill health, to a level as low as reasonably practicable and possible.

A contractor appointed as the Principal Contractor response to the Client's formal tender for the construction project, has to prepare an Occupational Health and Safety Plan based on his specification. The Client will evaluate this plan to ensure compliance with Construction Regulation 5(1) (h) that stipulates that the Client may only appoint a contractor who has the necessary competencies and resources to carry out this work safely.

The scope of this Contract includes the supply and installation of equipment and infrastructure for two new busbar routes connecting Feeder 1 to Incomer 1 and Feeder 2 to Incomer 2 with all ancillary plant work for ERWAT Waterval Wastewater Care Works, Modules 2 and 3, including:

- Manufacture, supply and Install new resin encapsulated aluminium busbars to accommodate electrical load of five Siemens Aeration Compressors (1050kW) between Feeder and Incomer MCC's;
- Install all mounting brackets, cable ladders for flexible leads and all necessary methods of earthing for busbar connection;
- Decommissioning, disconnection and removal of all existing supply cables in a staged manner to ensure maximum continued operation;
- Termination on new flexible leads to existing Feeder and Incomer MCC's;
- Modifications to the air inlet plenum Eastern wall to allow busbar access inside plenum and to Incomer MCC;
- Modification to the air inlet plenum door position to accommodate busbars running against the Blower house Northern wall;
- Testing and commissioning of the installation with COC certificate from qualified master electrician.
- Sealing of existing openings in walls with a non-shrink grout.
- Remove existing door and install new galvanized door in the plenum
- Minor building and structural work in order to install the door in the plenum
- Core drilling for the installation of the Busbars where required.

SI 4 GENERAL OCCUPATIONAL HEALTH AND SAFETY PROVISIONS

SI 4.1 Hazard Identification and Risk Assessment

SI 4.1.1 Risk assessments

This specification contains a list of risk assessment headings that have been identified by the Client as possibly applicable to the abovementioned contract work. It is, by no means, exhaustive and is only offered as assistance to the contractors intending to tender for the applicable works.
List of Risk Assessments to be used on site:

- Aggregate/Sand Delivery
- Brickwork
- Crane Operations
- Cutting of pipes
- Demolition Work
- Distribution boards – Electrical
- Drivers – of vehicles
- Electrical installation and Maintenance
- Electrical Welding Machines
- Fire prevention and protection
- Gas welding-cutting operations

- Generators
- Grinding Machines Operation
- Hand and spray painting
- Hand Excavation
- Hand tools
- Installation of Glass
- Laying of pipes
- Levelling – off materials
- Loading supervisor
- Loading/unloading – of trucks
- Machine operator
- Material delivery
- Material handling
- Plastering
- Portable Electrical Tools
- Portable ladders
- Scaffolding
- Site establishment
- Skill Saw
- Tile stacking
- Tiling
- Traffic control
- Trenches – Digging of
- Use of portable electrical tools
- Work in elevated positions
- Working close to existing services i.e. electrical, waste water etc
- Working close to traffic
- Workshops
- Working at/on open edges
- Working at a Wastewater Treatment Works with associated hazards.

SI 4.1.2 Development of Risk Assessments

Every Principal Contractor performing construction work shall, before the commencement of any construction work or work associated with the aforesaid construction work and during such work, ensure that risk assessments are undertaken by a competent person, appointed full time on site in writing, including proof of training, and the risk assessments shall form part of the Occupational Health and Safety plan and be implemented and maintained.

The risk assessments shall include, at least:

- The identification of the current as well as emerging risks and hazards to which persons may be exposed to

- The analysis and evaluation of the risks and hazards identified
- A documented plan of safe working procedures (*SWP*) and any method statements to mitigate, reduce or control the risks and hazards that have been identified
- A plan to monitor the application of the SWP's; and
- A plan to review the risk assessments as the work progresses and changes are introduced.
- A Plan Task Observation (*PTO*) must be done on a weekly basis on all risk assessments and the record of it must be in the safety file.

Based on the risk assessments, the Principal Contractor must develop a set of site-specific Occupational Health and Safety rules that will be applied to regulate the Occupational Health and Safety aspects of the construction.

The risk assessments, together with the site-specific Occupational Health and Safety rules, must be submitted to the **Client before** mobilization on site commences.

SI 4.1.3 Baseline or datum risk assessments

The contractor will be required carry out a risk assessment before the commencement of construction activities on the works. This "baseline" or "datum" risk assessment will form part of the contractor's health and safety plan. The risks and hazards to which persons, plant, vehicles and facilities may be exposed during the construction of the works should be identified and evaluated. Measures to reduce or control these risks or hazards should be defined during this assessment. The effectiveness of the measures (SWP's) defined and the baseline risk assessment prepared shall be monitored and reviewed from time to time to ensure that it remains relevant and accurate.

SI 4.1.4 Issue based risk assessments

The contractor will be required to carry out separate risk assessments during construction of the Works when methods and procedures are varied, for example when:

- Designs are amended,
- New machines are introduced,
- Plant is periodically cleaned and maintained,
- Plant is started-up or shut-down,
- Systems of work change or operations alter,
- Incidents or near-misses occur, or
- Technological developments invalidate prior risk assessments.

SI 4.1.5 Continued risk assessments

The Occupational Health and Safety Act specifically requires that employers shall provide and maintain working environments that are safe and without risk to health. The general awareness of hazards needs to be raised as work ethic to maintain a safe and risk free environment on an ongoing basis. This is achieved by continuous risk assessments, the most important form of risk assessment

that takes place as an integral part of day-to-day management. Examples of continuous risk assessments include:

- Regular audits,
- Maintaining general hazard awareness,
- Pre-work risk assessment

SI 4.1.6 Methodology for the preparation of risk assessments

The contractor shall in the preparation of his risk assessments, follow the following general principles:

- Employ a team of suitably qualified individuals with appropriately varied and relevant experience in risk assessment,
- The appointed risk assessor shall lead the risk assessment,
- Provide the team with background data, scope of work, potential hazards and underlying causes, and
- Where necessary employ experts for complex risk assessments and aspects of risk assessments that require experiential judgment,
- Institute an ongoing system of identifying aspects of the work that require risk assessment, and
- Conduct risk assessments in workshops of the team or by individual members of the team under guidance of the leader as appropriate to the situation.

Baseline Risk Assessment

ID	Type of Hazard	Risk Identification	Existing Controls	Risk Rating
1	Electrical installations and machinery	Electrical shock Injuries Bad workmanship Low productivity	Control, checks, register, training and audits	Medium
2	Cranes and lifting devices (high-ups and side booms)	Injuries to others Equipment/tools damage	Training, barricade under area	Medium
3	Working at heights	Falls, injuries	Training, PPE (harness usage) fall protection plan	Medium
4	Working in confined spaces	Asphyxiation and drowning	Training, PPE, test equipment, equipment register and audits	High
5	Biological hazards that may be encountered at a waste / sewage treatment works	Contact, inhalation and indigestion	Training, PPE and vaccination	High
6	Housekeeping	Injuries to others Equipment/tools damage	Training and audits	Low
7	Portable electrical tools and explosive powered tools	Electrical shock Injuries Bad workmanship Low productivity	Training, PPE, warning signs equipment register and audits	Medium
8	Vessels under pressure (VuP) and gas cylinders	Injuries to others Equipment/tools damage	Training, warning signs and audits	Medium Low
9	Stacking and storage	Injuries to others Equipment/tools damage	Training and audits	Medium Low
10	Lifting machines and tackle	Injuries to others Equipment/tools damage	Training, Barricade under area	Medium
11	Ladders	Falls, injuries	Training, PPE (harness usage) Fall protection plan	Medium
12	General machinery	Injuries to others Equipment/tools damage	Training, PPE and audits	Medium

The contractor is required to submit his own baseline risk assessment in accordance to the OCCUPATIONAL HEALTH AND SAFETY ACT 85 of 1993.

SI 4.1.7 Review of risk assessments

The Principal Contractor is to review the hazards identified, the risk assessments and the SWP's at each production planning and progress report meeting as the contract work develops and progresses and each time changes are made to the designs, plans and construction methods and/or processes.

The Principal Contractor must provide the Client, other contractors and all other concerned or affected parties with copies of any changes, alterations or amendments as soon as possible but within 14 days of such changes.

SI 4.2 LEGAL REQUIREMENTS

All Contractors entering into a contract with the Client shall, as a minimum, comply with the –

- OHS Act and a current, up-to-date copy of the OHS Act and its Regulations must be available on site at all times
- Compensation for Occupational Injuries and Diseases Act, No 130 of 1993 (*COID Act*). The Principal Contractor will be required to submit a letter of registration and "good-standing" from the Compensation Commissioner or compensation insurer before being awarded the contract. A current, up-to-date copy of the COID Act must be available on site at all times; and
- Where work is being carried out on mine premises, as well as where any tunneling will be done, the contractor will comply with the Mine Health and Safety Act and Regulations (*Act. 29 of 1996*), the Minerals Act and Regulations (*Act 50 of 1991*) and any other Occupational Health and Safety requirements that the mine may specify. Current, up-to-date copies of the last two mentioned Acts must be available on site at all times.

SI 4.3 STRUCTURE AND RESPONSIBILITIES

SI 4.3.1 Overall Supervision and Responsibility for Occupational Health and Safety

The Principal Contractor is responsible to implement and maintain the Occupational Health and Safety Plan approved by the Client.

The Chief Executive Officer (*in terms of Section 16(1) of the OHS Act*) of the Principal Contractor is to ensure that the Employer (*as defined in the OHS Act*) complies with the OHS Act. "*Legal Compliance Checklist*" may be used for this purpose.

The Principal Contractor's Chief Executive Officer may appoint any person reporting to him/her as Designated Person in terms of Section 16(2) of the OHS Act. Such Designated Person is responsible to assist the Chief Executive Officer to ensure that the Employer complies with the requirements of the OHS Act.

The construction supervisor(s) appointed are responsible for supervising the construction work and in specific to ensure that all work undertaken comply with the requirements of the OHS Act, its Regulations and the Client's specifications.

SI 4.3.2 Operational responsibilities for Occupational Health and Safety

The Principal Contractor shall appoint designated competent employees and/or other competent persons as outlined in the following list to assist with the operational responsibilities for Occupational Health and Safety (*this list is only the minimum requirement and is therefore in no way exhaustive*):

Appointment description	Appointment required in terms of
Accident/ Incident Investigator	General Safety Regulation 9(2)
Assistant Construction Manager	Construction Regulation 8(2)
Assistant Construction Work Supervisor	Construction Regulation 8(8)
Construction Manager	Construction Regulation 8(1)
Construction Supervisor	Construction Regulation 8(7)
Construction vehicle, mobile plant and machinery supervisor / operators	Construction Regulation 23
Demolition Supervisor	Construction Regulation 14(1)
Drivers of construction vehicles and operators or plant	Construction Regulation 23
Emergency/ Fire Co-ordinator	Construction Regulation 29
Excavation Supervisor	Construction Regulation 13(1)(a)
Explosive powered tool Controller	Construction Regulation 21(g)(i)
Explosive powered tool Operator	Construction Regulation 21(1)(b)
Fall Protection Planner	Construction Regulation 10(1)(a)
First-aiders	General Safety Regulation 3
Temp Works/ Form & Support Work Inspector	Construction Regulation 12(3)(f)
Temp Works/ Form & Support Work Supervisor	Construction Regulation 12(2)
H&S Safety Representative	Section 17 of the OHS Act
Lifting machines and equipment inspector / Operators	Construction Regulation 22
Risk Assessor	Construction Regulation 9(1)
Safety Officer / Consultant	Construction Regulation 8(5)
Scaffolding Erector	Construction Regulation 16
Scaffolding Inspector	Construction Regulation 16
Scaffolding Supervisor	Construction Regulation 16

These appointments must be in writing and the responsibilities clearly stated together with the period for which each appointment is made. This information must be communicated to and agreed with the appointees. Appointments should also include proof of training where applicable.

Register by a statutory body SACPCMP *(with effect 6 August 2015)*.

Copies of appointments must be submitted to the Client together with short concise CV's of the appointees as part of the Principal Contractor's Health and Safety plan and if appointed copies of the appointments included in the Occupational Health and Safety file. All appointments must be approved by the Client and any changes in appointees or appointments must be communicated to the Client and agreed upon before being implemented.

The Principal Contractor must, furthermore provide the Client with an organogram of all contractors that he/she has appointed or intends to appoint and keep this list updated on a weekly basis.

SI 4.3.3 Designation of Occupational Health and Safety Representatives

Where the Principal Contractor employs more than 20 persons [*including the employees of other contractors (sub-contractors)*] he has to appoint one Occupational Health and Safety representative for every 50 employees or part thereof. General Administrative Regulation 6 requires that the election, appointment and subsequent designation of the Occupational Health and Safety representatives be executed in consultation with employee representatives or employees.

Occupational Health and Safety representatives have to be designated in writing and the designation must include the area of responsibility of the person and term of the designation.

Should the appointed representatives require any training, assistance or facilities, the Principal Contractor must provide these.

SI 4.3.4 Duties and Functions of the Occupational Health and Safety Representatives

The Principal Contractor must ensure that the designated Occupational Health and Safety representatives conduct a weekly inspection of their respective areas of responsibility, using a checklist, and report thereon to the Principal Contractor.

Occupational Health and Safety representatives must be included in accident and/or incident investigations.

Occupational Health and Safety representatives must attend all Occupational Health and Safety committee meetings.

SI 4.3.5 Appointment of Occupational Health and Safety Committee

The Principal Contractor must establish an Occupational Health and Safety committee consisting of all the designated Occupational Health and Safety representatives together with a number of management representatives that are not allowed to exceed the number of Occupational Health and Safety representatives on the committee and a representative of the Client who shall act as a co-opt without voting rights. The members of the Occupational Health and Safety committee must be appointed in writing and copies of the appointments included in the Occupational Health and Safety file.

The Occupational Health and Safety committee must meet as a minimum on a **monthly** basis and consider, at least, the following agenda items:

- Opening and welcome
- Members present, apologies and absent
- Minutes of previous meeting
- Matters arising from the previous meeting
- Occupational Health and Safety representatives' reports
- Incident and/or accident reports and investigations

- Incident, accident and/or injury statistics
- Other matters
- Endorsement of registers and other statutory documents by a duly authorised representative of the Principal Contractor
- Close and next meeting.

SI 4.4 MANDATARIES & CONTRACTORS SAFETY FILE

It is a requirement that the Principal Contractor, when he appoints Contractors, includes an OHS Act Section 37(2) agreement (*i.e. Agreement with Mandatary*) in his agreement with such Contractor.

SI 4.5 ADMINISTRATIVE CONTROLS AND THE OCCUPATIONAL HEALTH AND SAFETY FILE

SI 4.5.1 The Occupational Health and Safety File

As required by Construction Regulation 7(2) (b), the Principal Contractor and other Contractors will each keep a completed and updated Occupational Health and Safety File on site, containing the following documents as a minimum:

- Contractual appointment letter
- Assessment and approval by Erwat Safety Office
- Assessment and approval by Erwat loss control office
- Notification of construction work
- Updated copy of the OHS ACT and its Regulations (*General Administrative Regulation 4)*
- Proof of registration and good standing with the Compensation Commissioner or a COID Insurer
- Occupational Health and Safety plan agreed with the Client including the underpinning risk assessment(s) and method statements
- Copies of Occupational Health and Safety committee meetings and other relevant minutes.
- Designs and/or drawings
- A list of Contractors (*Sub-Contractors*) including copies of the agreements between the parties and the type of work being done by each Contractor
- Occupational Health & Safety Policy
- Notice of new projects
- Relevant site start-up documentation
- Security measures
- Copies of written designations and appointments
- Arrangements with contractors and/or mandatories
- Occupational health and safety rules and procedures
- Induction training details
- Occupational health and safety training
- Occupational health and safety promotion
- Occupational health and safety representatives
- Occupational health and safety committees

- Workplace facilities, for example ablution, sheltered eating areas etc.
- Personal protective equipment
- Appointment and designation forms in the safety file
- Workplace inspections and assessments
- Investigation and reporting of incidents and/or accidents
- Mechanical safeguarding
- Safeguarding against hazardous substances
- Lifting machinery and equipment
- Construction vehicles and mobile plant
- Welding, heating and flame cutting
- Excavations
- Protection of the environment affected by construction activities
- Keeping of records in terms of OHSACT

The following registers:

- Accident and/or incident register (*Annexure 1 of the General Administrative Regulations*)
- Occupational Health and Safety representatives inspection register
- Construction vehicles and mobile plant inspections by controller
- Daily inspections of vehicles, plant and other equipment by the operator, driver and/or user
- Designer's inspections and structures record
- Inspection and maintenance of explosive powered tools
- Inspection of electrical installations (including inspection of portable electrical tools, electrical equipment and other electrical appliances)
- Fall protection inspections
- First-aid box content
- Record of first-aid treatment
- Fire equipment inspections and maintenance
- Record of hazardous chemical substances kept and used on site
- Ladder inspections
- Machine safety inspections (*including machine guards, lock-outs etcetera*);
- Inspection registers and logbooks for lifting machines and – tackle *(including daily inspections by drivers/operators*)
- Inspection of scaffolding
- Inspection of stacking and storage
- Inspections of structures
- Pressure Equipment inspections; and
- Inspection of welding equipment.
- All other applicable record.

The Client will conduct an evaluation of the Principal Contractor's Occupational Health and Safety file from time to time during a month, but at least once a month.

The Principal Contractor will conduct an evaluation of the Contractor's Occupational Health and Safety file from time to time during a month, but at least once a month.

Each Contractor must keep his/her Health and Safety File updated for the Principal Contractor, on a weekly basis. The Subcontractor will agree to comply with the terms of the Provisions of Section 37(2) of the Occupational & Safety Act, Act No. 85 of 1993 together with the Construction Regulations 2014 as amended.

Furthermore the sub ccontractor is to indemnify the Employer against any claims in this regard.

SI 4.5.2 Non-conformance to any Health and Safety requirements

The Employer's Safety Consultant (Employer's Agent in terms of the Contract Data) has the right to impose penalties for non-conformance to any safety requirements in terms of the Act and Regulations and the safety specification / plan. A first and only written warning will be issued by the Safety Consultant (*and ratified by the Principal Agent*) to the Principal Contractor in the event of any non-conformance, by means of a contract instruction (*in terms of the Principal Building Agreement*). Immediate compliance **(*within 1 (one) calendar day*)** should be achieved after a written warning has been issued, to the full satisfaction of the Safety Consultant and or Safety Representative of the Principal Contractor, failing which a penalty will be imposed on the Principal Contractor. This penalty will be recovered through a recovery statement and will be equal to an amount calculated at a rate of **R 3,000-00** per calendar day for each and every calendar day of default in terms of the Act and Regulations, safety specification and or safety plan.
The Principal Contractor will recover this penalty in full from the defaulting Sub-Contractor through the N/S recovery statement issued in terms of their Subcontract Agreement.

SI 4.6 OCCUPATIONAL HEALTH AND SAFETY GOALS AND OBJECTIVES AND ARRANGEMENTS FOR MONITORING AND REVIEW OF OCCUPATIONAL HEALTH AND SAFETY PERFORMANCE

The Principal Contractor is required to maintain a casualty incident frequency rate (CIFR) of at least 4 to this document: "Measuring Injury Experience" and report on this to the Client on a monthly basis.

SI 4.7 NOTIFICATION OF CONSTRUCTION WORK

The Principal Contractor must, where the contract meets the requirements laid down in Construction Regulation 4, within 7 days before the work is to be carried out, notify the Department of Labour of the intention to carry out construction work and use the form (*Annexure A in the Construction Regulations*) for this purpose. A copy of the notification must be held on the Occupational Health and Safety file and a copy must also be forwarded to the Client for record purposes.

SI 4.8 TRAINING, AWARENESS AND COMPETENCE

The contents and syllabi of all training required by the OHS Act and Regulations must be included in the Principal Contractor's Occupational Health and Safety plan.

SI 4.8.1 **General Induction Training**

All members of the Contractor's site management as well as all the persons appointed as responsible for Occupational Health and Safety in terms of the Construction and other Regulations will be required to attend a general induction session.

All employees of the principal and other Contractors must be in possession of proof of general induction training.

SI 4.8.2 Site-specific Induction Training

The Principal Contractor will be required to develop a contract work project specific induction training course based on the risk assessments for the contract work and train all employees and other Contractors and their employees in this.

All employees of the Principal and other Contractors must be in possession of proof that they have attended a site-specific Occupational Health and Safety induction training at all times.

SI 4.8.3 Other Training

All operators, drivers and users of construction vehicles, mobile plant and other equipment must be in possession of valid proof of training and where applicable licenses for this applicable construction vehicles & mobile plant.

All employees in jobs requiring training in terms of the OHS Act and Regulations must be in possession of valid proof of training.

Occupational Health and Safety training requirements [*as required by the Construction Regulations and as indicated by the Occupational Health and Safety Specification and the risk assessment(s)*] i.e.:

- General induction *(Section 8 of the OHS Act)*
- Site and job specific induction, including visitors *(Sections 8 and 9 of the Act)*
- Site and project manager
- Construction supervisor
- Occupational Health and Safety representatives *[Section 18 (3) of the Act]*
- Training of the appointees indicated in paragraphs 4.3.1 and 4.3.2 above
- Operators and drivers of construction vehicles and mobile plant (Construction Regulation 23)
- Basic fire prevention and protection *(Environmental Regulations 9 and Construction Regulation 29)*
- Basic first-aid *(General Safety Regulations 3)*
- Storekeeping methods and safe stacking *(Construction Regulation 28)*; and
- Emergency, security and fire coordinator.

SI 4.8.4 Awareness and Promotion

The Principal Contractor is required to have a promotion and awareness programme in place to create an Occupational Health and Safety culture within employees. The following are some of the methods that may be used:

- Toolbox talks (Weekly)
- Posters
- Videos
- Competitions
- Suggestion schemes
- Participative activities such as employee “Occupational Health and Safety circles”.

SI 4.8.5 Notices and Signs

The following notices and signs are, where applicable, compulsory on the construction site as well as the Contractors’ yards:

Area and/or activity where notice or sign is required	**Notice or sign required in terms of**
Display of notices and signs	General Safety Regulation 2B and SANS Code 1186
Entry	General Safety Regulation 2C(2)
First-aid	General Safety Regulation 3(6)
Toilets and change rooms	Facilities Regulation 2 (5) 4(2)(f)
Storage of flammable materials	General Safety Regulation 4(8)(a)(i) and (ii) *[10(e) only applicable to Contractor’s yards]*
Grinding wheels	Driven Machinery Regulation 8(1)(7)
Machinery	General Machinery Regulation 9 *(Schedule D)*
Explosive powered tools	Construction Regulation 21(2)(f)
Area and/or activity where notice or sign is required	**Notice or sign required in terms of**
Prohibition on smoking and eating or drinking at the workplaces where high risk substances [*FR5 (1)*] are stored or handled	Facilities Regulation 6(b)
Non-potable water	Facilities Regulation 7(B)

SI 4.8.6 Competence

The Principal Contractor shall ensure that his and other Contractors’ employees appointed are competent and that all training required doing the work safely and without risk to health of their or other persons, has been successfully completed before work commences.

The Principal Contractor shall ensure that follow-up and refresher training is conducted on a regular basis as well as the contract work progresses and the work situation changes.

Records of all training must be kept on the Occupational Health and Safety file for auditing purposes.

SI 4.9 CONSULTATION, COMMUNICATION AND LIAISON

The following arrangements will apply:

Occupational Health and Safety liaison between the Client, the Principal Contractor, the other Contractors, the designer and other concerned parties will be through the Occupational Health and Safety committee. In the absence of a Health and Safety committee, the Client and Principal Contractor will agree on an alternative communication forum to be implemented.

In addition to the above, communication may be directly to the Client or his appointed Agent, verbally (followed up in writing within 14 days) or in writing, as and when the need arises.

Consultation with the workforce on Occupational Health and Safety matters will be through their supervisors, Occupational Health and Safety representatives, the Occupational Health and Safety committee and their elected trade union representatives, if any.

The Principal Contractor will be responsible for the dissemination of all relevant Occupational Health and Safety information to the other Contractors, for example design changes agreed with the Client and the designer, instructions by the Client and/or his agent, exchange of information between Contractors, the reporting of hazardous and/or dangerous conditions and/or situations etc.

The Principal Contractor will be required to do site safety walks with the Client and/or his Agent on a basis to be determined and agreed between the parties.

The Principal and other Contractors will be required to conduct toolbox talks with their employees on a weekly basis and records of these must be kept on the Occupational Health and Safety file. Employees must acknowledge the receipt of toolbox talks which record must, likewise be kept on the Occupational Health and Safety file. Toolbox talk topics must include applicable health and safety issues.

The Principal Contractor’s most senior manager on site will be required to attend all the Client’s Occupational Health and Safety meetings.

The Client or his Agent and the Principal Contractor will agree of the dates, times and venues of the Occupational Health and Safety meetings.

SI 4.10 CHECKING, REPORTING AND CORRECTIVE ACTIONS

SI 4.10.1 Monthly compliance assessment by Client

The Client will be conducting a monthly assessment to comply with Construction Regulation 5(1) (*o*) and to confirm that the Principal Contractor has implemented and is maintaining the agreed and approved Occupational Health and Safety plan.

SI 4.10.2 Other assessments and inspections by the Client

The Client reserves the right to conduct other ad-hoc assessments and inspections as deemed necessary. This could include among others site safety walks and Sub Contractor safety file audits.

SI 4.10.3 Conducting an assessment

A representative of the Principal Contractor must accompany the Client on all assessments and inspections and may conduct his/her own inspection at the same time. Each party will, however, take responsibility for the results of his/her own assessment and/or inspection.

SI 4.10.4 Contractor's assessments and inspections

The Principal Contractor is to conduct his own internal assessments and inspections to verify compliance with his own Occupational Health and Safety plan and management system as well as the requirements of this specification and the compliance of other Contractors under his/her control. These assessments and inspections must include an audit on documentation no less than once every month.

SI 4.10.5 Inspections by Occupational Health and Safety representatives and other appointees

Occupational Health and Safety representatives must conduct weekly inspections of their areas of responsibility and report thereon to their foreman or supervisor whilst other appointees must conduct inspections and report thereon as specified in their appointments for example vehicle, plant and machinery drivers, operators and users must conduct daily inspections before start-up.

SI 4.10.6 Recording and review of inspection results

All the results of the abovementioned inspections must be in writing, reviewed at Occupational Health and Safety committee meetings, endorsed by the chairperson of the meeting and placed on the Occupational Health and Safety file.

SI 4.10.7 Reporting of Inspection results

The Principal Contractor is required to provide the Client Health and Safety Consultant with monthly reports and inspections.

SI 4.11 INCIDENT REPORTING AND INVESTIGATION

SI 4.11.1 Reporting of Accidents and Incidents

The Principal Contractor must report all incidents where an employee is injured on duty to the extent that he/she:

- dies
- becomes unconscious
- loses a limb or part of a limb
- is injured or becomes ill to such a degree that he/she is likely either to die or to suffer a permanent physical defect or likely to be unable for a period of at least 14 days either to work or continue with the activity for which he/she was usually employed

or where –

- a major incident occurred
- the health or safety of any person was endangered
- where a dangerous substance was spilled
- the uncontrolled release of any substance under pressure took place
- machinery or any part of machinery fractured or failed resulting in flying, falling or uncontrolled moving objects
- machinery ran out of control

to the Client within two days and to the Provincial Director of the Department of Labour within seven days from date of incident (*Section 24 of the OHS ACT and General Administrative Regulation 8*), **except** that, where a person has died, has become unconscious for any reason or has lost a limb or part of a limb or may die or suffer a permanent physical defect, the incident must be reported to both the Client and the Provincial Director of the Department of Labour forthwith by telephone, telefax or e-mail. All other reports should still be completed and provided as required.

The Principal Contractor is required to provide the Client with copies of all statutory reports required in terms of the OHS ACT within 7 days of the incident occurring.

The Principal Contractor is required to provide the Client with copies of all internal and external accident/incident investigation reports, including the reports contemplated in 4.11.2 below, within 7 days of the incident occurring.

SI 4.11.2 Accident and Incident Investigation

The Principal Contractor is responsible for the investigation of all accidents and/or incidents where employees and non-employees were injured to the extent that he, she and/or they had to be referred for medical treatment by a doctor, hospital or clinic.

The results of the investigation are to be entered into the accident and/or incident register.

The Principal Contractor is responsible for the investigation of all minor and non-injury incidents as described in Section 24 (1) (b) and (c) of the OHS ACT and keeping a record of the results of such investigations including the steps taken to prevent similar accidents in future.
The Principal Contractor is responsible for the investigation of all road traffic accidents, related to the construction activities, and keeping a record of the results of such investigations including the steps taken to prevent similar accidents in future.

The Client reserves the right to hold its own investigation into an incident or call for an independent external investigation.

SI 5 OPERATIONAL CONTROL

SI 5.1 EMERGENCY PREPAREDNESS, CONTINGENCY PLANNING AND RESPONSE

The Principal Contractor must appoint a competent person to act as emergency controller and/or coordinator.

The Principal Contractor must conduct an emergency identification exercise and establish what emergencies could possibly develop. He/she must then develop detailed contingency plans and emergency procedures, taking into account any emergency plan that the Client may have in place.

The Principal Contractor and the other Contractors must hold regular practice drills of contingency plans and emergency procedures to test them and familiarize employees with them.

SI 5.2 FIRST-AID

The Principal Contractor must provide first-aid equipment (including a stretcher) and have qualified first-aider(s) on site as required by General Safety Regulation 3 of the OHS Act.

The contingency plan of the Principal Contractor must include arrangements for the speedily and timeously transportation of injured and/or ill person(s) to a medical facility or of getting emergency medical aid to person(s) that may require it.

The Principal Contractor must have firm arrangements with his other Contractors in place regarding the responsibility of the other Contractors injured and/or ill employees.

SI 5.3 MEDICAL CERTIFICATE

A Contractor must ensure that all his or her employees have a valid medical certificate of fitness specific to the construction work to be performed and issued by an Occupational Health Practitioner in the form of **Annexure 3** of the Construction Regulations.

SI 5.4 SECURITY

The Principal Contractor must establish site access rules and implement and maintain these throughout the construction period.

Access control must be controlled and handled by a security company that is registered by SIRA and the rule that non-employees will not be allowed on site unaccompanied.

The Principal Contractor must develop a set of project applicable security rules and procedures and maintain these throughout the construction period.

SI 5.5. FALL PROTECTION PLAN (WORKING IN A FALL RISK POSITION)

A pre-emptive risk assessment will be required for any work to be carried out above (2) two metres from the ground or any floor level and will be classified as "*work in elevated positions*".

As far as is practicable, any person working in an elevated position will work from a stable platform, ladder or other device that is at least as safe as if he or she is working at ground level and whilst working in this position be wearing a single belt with lanyard to prevent the person falling from the platform, ladder or other device utilized. This safety belt will be, as far as is possible, secured to a point away from the edge over which the person might fall and the lanyard must be of such a length and strength that the person will not be able to move over the edge.

Alternatively any platform, slab, deck or surface forming an edge over which a person may fall may be fitted with suitable guard rails at two different heights as prescribed in SANS 10085 code of practice for the design, erection, use and inspection of access scaffolding.

Where the requirement is not practicable, the person will be provided with a full body harness that will be worn and attached above the wearer's head at all times and the lanyard must be fitted with a shock absorbing device or the person must be attached to a fall arrest system that is approved by the Client.

Where the requirements are not practicable, a suitable catch net must be erected.

Employees working in elevated positions must be trained to do this safely and without risk to their Health and Safety.

Where work on roofs is carried out, the risk assessment must take into account the possibility of persons falling through fragile material, i.e. skylights and openings in the roof as well as the possibility of working in unsafe weather conditions.

Updated medical certificate confirming the fitness of employees working at a fall risk position should be kept on the Health and Safety file at all times.

SI 5.6 STRUCTURES

The Principal Contractor must ensure that:

Only skilled employees are allowed to erect structures and that the skills of these employees are being verified at regular intervals.

Steps are taken to ensure that no structure becomes unstable or collapses due to construction work being performed on it or in the vicinity of it.

No structure is overloaded to the extent where it becomes unsafe.

He or she has received from the designer the following information:

- Information on known or anticipated hazards relating to the construction work and the relevant information required for the safe execution of the construction work
- A geo-scientific report (where applicable)
- The loading the structure is designed to bear
- The methods and sequence of the construction process
- Any other applicable information
- All drawings pertaining to the design are on site and available for inspection

SI 5.7 ACCESS SCAFFOLDING

Access scaffolding must be erected, used and maintained safely in accordance with Construction Regulation 16 and SA National of Standards Code of Practice, SANS 10085 entitled, "*The Design, Erection, Use and Inspection of Access Scaffolding".*

Detailed consideration must be given to all scaffolding to ensure that it is properly planned to meet the working requirements, designed to carry the necessary loadings and maintained in a sound condition. It must also be ensured that there is sufficient material available to erect the scaffolding properly.

Scaffolding must be erected, altered or dismantled by person(s) who has/have adequate training and experience in this type of work or under the continuous supervision of such a person.

SI 5.8 LIFTING EQUIPMENT

SI 5.8.1 Lifting equipment must be designed and constructed in accordance with the manufactures/designers specifications as well as generally accepted technical standards and operated, used, inspected and maintained in accordance with the manufactures requirements as well as that of the Driven Machinery Regulation 18 of the OHS Act.

The Driven Machinery Regulation requires that:

- Lifting equipment is clearly and conspicuously marked with the maximum mass load (MML) that it is designed to carry safely. When the MML varies with the conditions of use, the table of maximum loads should be used by the driver/operator
- Each winch on a lifting machine must at all-time have, at least, three full turns of rope on the drum when the winch has been run to its lowest limit
- Lifting equipment be fitted with a brake or other applicable device capable of holding the MML. This brake or device must automatically prevent the downward movement of the load when the lifting power is interrupted
- Lifting equipment fitted with a load limiting device that automatically arrest the lift when the load reaches its highest safe position or when the mass of the load is greater than the MML
- Every chain or rope on a lifting machine that forms an integral part of the machine must have a factor of safety as prescribed by the manufacturer of the machine and where no standard is available the factor of safety must be:

    - chains – 4 (four)
    - steel wire ropes – 5 (five)
    - fiber ropes – 10 (ten)

- Every hook or load attaching device must be designed such or fitted with a device that will prevent the load from slipping off or disconnecting
- Every lifting machine must be inspected and load tested by a competent person every time it has been dismantled and re-erected and every **12 months** after that. The load test must be in accordance with the manufacturers prescription or to 110% of the MML in addition all ropes, chains, hooks or other attaching devices, sheaves, brakes and safety devices forming an integral part of a lifting machine must be inspected every **6 months** by a competent person
- All maintenance, repairs, alterations and inspection results must be recorded in a log book and each lifting machine must have its own log book; and
- No person may be lifted by a lifting machine not designed for lifting persons unless in a cradle approved by an inspector of the Department of Labour

SI 5.9 LIFTING TACKLE

The following requirements will apply to lifting tackle:

- All lifting tackle must be examined at intervals not exceeding **3 months** by person as prescribed in DMR 18(10)(e) Records of such inspections must be kept in the safety file. Manufactured of sound material, well-constructed and free from patent defects
- Clearly and conspicuously marked with and identity number
- Maximum mass load factor of safety:

▪ Natural fiber ropes	10 (ten)
▪ Man-made fiber ropes and woven webbing	6 (six)
▪ Steel wire ropes – single rope	6 (six)
▪ Steel wire ropes – combination slings	6 (six)
▪ Mild Steel chains	5 (five)
▪ High tensile/alloy steel chains	4 (four)

- Steel wire ropes must be discarded (not used any further for lifting purposes) when wear and corrosion is evident and must be examined by a competent person every three months for this purpose and the results recorded in a designated log book
- Lifting tackle must be stored or protected as to prevent damage or deterioration when not in use.

SI 5.10 MACHINE OPERATORS

The following requirements will apply to machine operators:

- Only certified and/or competent employees may be allowed to operate any machinery
- Every lifting machine operator must be trained specifically for the type of lifting machine that he or she is operating
- Operators of Jib cranes with a maximum mass load of 500 kg or more must be in possession of a certificate of training issued by an accredited (*by the Department of Labour*) training provider.

SI 5.11 CONSTRUCTION VEHICLES AND MOBILE PLANT

Construction vehicles and mobile plant will initially during the competency evaluation process be inspected by the Principal Contractor prior to being allowed on a project site and suppliers of hired vehicles, plant and equipment will be required to comply with this specification as well as the OHS Act and Regulations.

Construction vehicles and mobile plant must be:

- Of acceptable design and construction
- Maintained in good working order
- Used in accordance with their design and intention for which they were designed

- Operated and/or driven by trained, competent and authorised operators/drivers
- No unauthorised persons to be allowed to drive construction vehicles and mobile plant
- Provided with safe and suitable means of access
- Fitted with adequate signalling devices to make movement safe including reversing
- Excavations and other openings must be provided with sufficient barriers to prevent construction vehicles and mobile plant from falling into same
- Provided with roll-over protection
- Inspected daily before start-up by the driver, operator and/or user and the findings recorded in a register/log book
- Fitted with two head and two tail lights that is in good working condition whilst operating under poor visibility conditions; and
- Used for transporting persons must have seats firmly secured and sufficient for the number of persons being transported
- Operators and drivers of construction vehicles and mobile plant must be in possession of a valid medical certificate declaring the operator and/or driver physically and psychologically fit to operate or drive construction vehicles and mobile plant
- No loose tools, material etc. is allowed in the driver and/or operators compartment/cabin nor in the compartment in which any other persons are transported
- No person may ride on construction vehicles and mobile plant except for in a safe place designed and provided for this purpose
- The construction site must be organized to facilitate the movement of construction vehicles and mobile plant in such a manner that pedestrians and other vehicles are not endangered. Traffic routes to be suitable, sufficient in number and adequately demarcated
- Construction vehicles and mobile plant left unattended after hours adjacent to roads and areas where there is traffic movement must be fitted with lights, reflectors or barricades to prevent moving traffic from a sudden emergency, or to come into contact with the parked construction vehicles and mobile plant
- In addition construction vehicles and mobile plant left unattended after hours must be parked with all buckets, booms etc. full lowered, the emergency brakes engaged and, where necessary, the wheels chocked, the transmission in neutral and the motor switched off and the ignition key removed and stored safely
- Employees employed adjacent or on public roads must wear reflective safety vests
- All construction vehicles and mobile plant daily inspection records must be kept in the Occupational Health and Safety file.

SI 5.12 ELECTRICAL INSTALLATIONS

The installation of temporary electricity for construction use shall be in accordance with Construction Regulation 24 and the Electrical Installation Regulations.

The Principal Contractor must ensure that:

- Existing services are located and marked before construction commences and during the progress thereof

- Where the abovementioned is not possible, employees with jackhammers etc. are protected against electric shock by the use of suitable protective equipment e.g. rubber mats, insulated handles etc
- Electrical installations and -machinery are sufficiently robust to withstand normal working conditions on site
- Temporary electrical installations must be inspected at least once per week by a competent person and a record of the inspections kept on the Occupational Health and Safety file
- Electrical machinery used on a construction site must be inspected daily before start-up by the competent driver/operator or any other competent person and a record of the inspections kept on the Occupational Health and Safety file; and
- A competent person appointed in writing must control all temporary electrical installations.

SI 5.13 ELECTRICAL AND MECHANICAL LOCKOUT

An electrical and mechanical lockout procedure must be developed by the Principal Contractor and submitted to the Client for approval before construction commences. All Contractors on site must adhere to this lockout procedure.

SI 5.14 USE AND STORAGE OF FLAMMABLES

The Principal Contractor must ensure that:

- No person is required or permitted to work in a place where there is the danger of fire or an explosion due to flammable vapors being present unless adequate precautions is taken
- No flammables is used or applied e.g. in spray painting, unless in a room or cabinet or other enclosure specially designed and constructed for the purpose unless there is no danger of fire or explosion due to the application of adequate ventilation
- The workplace is effectively ventilated. Where this cannot be achieved:
    - Employees must wear suitable respiratory equipment
    - No smoking or other sources of ignition is allowed in the area
    - The area is conspicuously demarcated as "*flammable*"

- Flammables stored on a construction site are stored in a well-ventilated, reasonably fire-resistant container, cage or room that is kept locked with access control measures in place and sufficient firefighting equipment installed and fire prevention methods practiced for example proper housekeeping
- Flammables stored in a permanent flammable store are stored so that no fire or explosion is caused i.e.:
    - Stored in a locked and well-ventilated reasonably fire resistant container, cage or room conspicuously demarcated as "*Flammable Store – No Smoking or Naked Lights*"

- The flammables store to be constructed of two-hour fire retardant walls, door and roof and separated from adjoining rooms or workplaces by means of a two-hour fire retardant fire wall

- Adequate and suitable firefighting equipment installed around the flammables store and marked with the prescribed signs
- All electrical switches and fittings to be of a flameproof design
- Any work done with tools in a flammable store or work areas to be of a non-sparking nature
- No Class A combustibles such as paper, cardboard, wood, plastic, straw etcetera to be stored together with flammables
- The flammable store to be designed and constructed to, in the event of spillage of liquids in the store, to contain the full quantity + 10% of the liquids stored
- A sign indicating the capacity of the store to be displayed on the door
- Only one day's quantity of flammable is to be kept in the workplace
- Containers (including empty containers) to be kept closed to prevent fumes/vapors from escaping and accumulating in low lying areas
- Metal containers to be bonded to earth whilst decanting to prevent build-up of static forces; and
- Welding and other flammable gases to be stored segregated as to the type of gas and empty and full cylinders.

SI 5.15 HOUSEKEEPING

The Principal Contractor must ensure that:

- Housekeeping is continuously implemented and maintained
- Materials and equipment is properly stored
- Scrap, waste and debris is removed regularly
- Materials placed for use are placed safely and not allowed to accumulate or cause obstruction to the free-flow of pedestrians and vehicular traffic
- Waste and debris not to be removed by throwing from heights but by chute or crane
- Where practicable, construction sites are fenced off to prevent entry of unauthorized persons
- Catch platforms or -nets are erected over entry and exit ways or over places where persons are working to prevent them being struck by falling objects
- An unimpeded work space is maintained for every employee
- Every workplace is kept clean, orderly and free of tools and the likes that are not required for the work being done
- As far as is practicable, every floor, walkway, stair, passage and gangway is kept in good state of repair, skid-free and free of obstruction, waste and materials
- The walls and roof of every indoor workplace be sound and leak-free; and
- Openings in floors, hatchways, stairways and open sides of floors or buildings are barricaded, fences, boarded over or provided with protection to prevent persons from falling.

SI 5.16 STACKING AND STORAGE

The Principle Contractor must ensure that:

- A competent person is appointed in writing to supervise all stacking and storage on a construction site

- Adequate storage areas are provided and demarcated
- The storage areas are kept neat and under control
- The base of any stack is level and capable of sustaining the weight exerted on it by the stack
- The items in the lower layers can support the weight exerted by the top layers
- Cartons and other containers that may become unstable due to wet conditions are kept dry
- Pallets and containers are in good condition and no material is allowed to spill out
- The height of any stack does not exceed 3 times the base unless stepped back at least half the depth of a single container at least every fifth tier or the approval of an inspector of the Department of Labour has been obtained to build the stacks higher with the aid of a machine. (The operator of the machine must be protected against items falling from overhead or off the stack and no items may overhang)
- The articles that make up a single tier are consistently of the same size, shape and mass
- Structures for supporting stacks are structural or brick wall sound and able to support the mass of the stack
- No articles are removed from the bottom of the stack first but from the top tier first
- Anybody climbing onto a stack can and does do it safely and that the stack is sufficiently stable to support him or her
- Stacks that are in danger of collapsing are broken down and restacked
- Stability of stacks are not threatened by vehicles or other moving plant and machinery
- Stacks are built in a header and stretcher fashion and that corners are securely bonded
- Persons climbing onto stacks do not approach unguarded moving machinery or electrical installations.

SI 5.17 STORAGE OF FLAMMABLE AND HAZARDOUS CHEMICALS

See paragraphs 5.18 and 5.23 below.

SI 5.18 FIRE PREVENTION AND PROTECTION

The Principal Contractor must ensure that:

- The risk of fire is avoided
- Sufficient and suitable storage of flammables is provided
- Sources of ignition is obviated wherever flammable or highly combustible material is present in the workplace, for example
- Notices prohibiting smoking is displayed and enforced
- Welding and flame cutting is only allowed under controlled conditions that includes written hot work permits
- Only spark-free hand and power tools are used
- No grinding, cutting and shaping of ferrous metals are allowed using electrically driven power tools that produces sparks
- Flameproof switches and fittings are to be used in the flammable atmosphere
- Good housekeeping is maintained to prevent the accumulation of unnecessary combustibles
- Adequate ventilation is maintained

- Adequate and suitable fixed and portable firefighting equipment are provided and maintained in good working order
- Maintenance must include:
- Regular inspections by a competent person appointed in writing and records of such inspections should be kept in the Occupational Health and Safety file
- Annual inspection and service by an accredited service provider
- All employees are instructed in the use of the firefighting equipment and know how to attempt to extinguish a fire
- A sufficient number of employees are appointed and trained to act as an emergency team to deal with fires and other emergencies
- Employees are informed regarding emergency evacuation procedures and escape routes;
- Emergency escape routes are kept clear at all times and clearly marked
- Evacuation assembly points are demarcated and made known to employees;
- Evacuation is practiced to ensure that all persons are evacuated timeously
- Roll call is held after evacuation to account for all employees and to ensure that no-one including visitors have been left behind; and
- A clearly audible, to all persons on site, siren or alarm is fitted and regularly tested.

SI 5.19 EATING, CHANGING, WASHING AND TOILET FACILITIES

SI 5.19.1 Toilets

The provision of toilets for each sex is required in terms of the National Building Regulations and Construction Regulation 30.

Chemical toilets are allowed instead of the water borne sewerage type. Toilets have to be provided at a ratio of at least 1 toilet per 30 employees.

SI 5.19.2 Showers

At least cold-water showers of some sort for each sex have to be provided at a ratio of at least 1 shower per 15 employees.

SI 5.19.3 Change Rooms

Some form of screened off changing facility must be provided separately for each sex.

SI 5.19.4 Eating Facility

Some form of eating facility sheltered from the sun, wind and rain must be provided.

SI 5.19.5 Living Accommodation

Where the site is in a remote location and transport to home is not readily available, reasonable and suitable living accommodation must be provided.

SI 5.20 PERSONAL AND OTHER PROTECTIVE EQUIPMENT (SECTIONS 8, 15 AND 23 OF THE OHS ACT & GSR 2)

The Principal Contractor is required to proactively identify the hazards in the workplace and deal with them on an ongoing basis. He/she must either remove them or, where impracticable take steps to protect employees and make it possible for them to work safely and without risk to health under the hazardous conditions.
Personal protective equipment should, however, be the last resort and there should always first be an attempt to apply engineering and other solutions to mitigating hazardous situations before the issuing of personal protective equipment is considered.

Where it is not possible to create an absolutely safe and healthy workplace the Principal Contractor is required to inform employees regarding this and issue, free of charge, suitable equipment to protect them from any hazards being present and that allows them to work safely and without risk to health in the hazardous environment.

It is a further requirement that the Principal Contractor maintain the said equipment, that he/she instructs and trains the employees in the use of the equipment and ensures that the prescribed equipment is used by the employee/s.

Employees do not have the right to refuse to use and/or wear the equipment prescribed by the employer and, if it is impossible for an employee to use or wear prescribed protective equipment through health or any other valid reason, the employee cannot be allowed to continue working under the hazardous condition(s) for which the equipment was prescribed but an alternative solution has to be found that may include relocating the employee.

The Principal Contractor may **not charge any fee** for protective equipment prescribed by him or her **but may charge for equipment under the following conditions:**

- Where the employee requests additional issue in excess of what is prescribed
- Where the employee has patently abused or neglected the equipment leading to early failure;
- Where the employee has lost the equipment.

All employees shall, as a minimum, be required to wear the following personal protective equipment on any of the Client's projects:

- New protective overalls
- New protective footwear
- New protective headwear; and
- Eye/face & hand protection where necessary.

SI 5.21 PORTABLE ELECTRICAL TOOLS AND EQUIPMENT

Portable electrical tools and equipment includes every unit that takes electrical power from a 15 ampere plug point and is moved around for use in the workplace i.e. drills, saws, grindstones, portable lights, etcetera. In addition electrical appliances such as fridges, hotplates, heaters, and etcetera must be inspected and maintained to the same standards as portable electrical tools and appliances.

The use, inspection and maintenance of portable electrical tools and equipment must be governed by the following:

- Regular inspections by a competent person appointed in writing
- Inspection results must be recorded in a register
- Only competent authorized persons are allowed to use portable electrical tools and equipment; and
- The correct protective equipment is worn / used whilst operating portable electrical tools and equipment.

This equipment:

- Must be maintained in good condition at all times to prevent an electrical shock to the user
- The main source should incorporate an earth leakage protection device or receive power through a double wound transformer or be double insulated and clearly marked as such; and
- All equipment must be fitted with a switch to allow for safe and easy starting and stopping.

SI 5.22 PORTABLE LIGHTS

The following requirements apply to portable lights:

- Must be fitted with a robust non-hygroscopic non-conducting handle
- Live metal parts which may become live must be protected against contact
- The lamp must be protected by a strong guard
- The cable lead-in must withstand rough handling
- A register be kept for each piece of equipment with findings of regular inspections undertaken to evaluate the condition of these lights
- Inspections must be undertaken that concentrate on at least the plug, cord, switch and any obvious faults; and
- When used in wet/damp/metal container conditions, it must be protected.

SI 5.23 PUBLIC HEALTH AND SAFETY (SECTION 9 OF THE OHS ACT)

The Principal Contractor is responsible for ensuring that non-employees affected by the construction work are made aware of the dangers likely to arise from said construction work as well as the precautionary measures to be observed to avoid or minimize those dangers. This includes:

- Non- employees entering the site for whatever reason
- The surrounding community; and
- Passersby the site.

Appropriate signage must be posted to this effect and all employees on site must be instructed to ensure that non-employees are protected at all times.

All non-employees entering the site must receive site applicable induction into the hazards and risks and the control measures for these.

SI 5.24 HAZARDOUS CHEMICAL SUBSTANCES

The Principal Contractor must ensure that:

- Employees receive the necessary information and training to be able to use and store hazardous chemical substances safely
- Employees obey lawful instructions regarding
- The wearing and use of protective equipment
- The use and storage of hazardous chemical substances
- The prevention of the release of hazardous chemical substances
- The wearing of exposure monitoring and measuring equipment
- The cleaning up and disposal of materials containing hazardous chemical substances
- Housekeeping, personal hygiene and the protection of the environment
- The risk assessments required in terms of Construction Regulation 7 include employee exposure to hazardous chemical substances and that the necessary measures be taken to protect persons from being detrimentally affected by hazardous chemical substances present or used in the workplace
- Suppliers provide the necessary information in the form of a material safety data sheet regarding hazardous chemical substances required to ensure the safe use and storage of that substances
- An up-to-date list is kept on site of hazardous chemical substances stored and used together with the material safety data sheet of the said hazardous chemical substances
- Hazardous chemical substances containers be clearly marked as to the contents and main hazardous category e.g. “Flammable” or “Corrosive” and the reference number of the hazardous chemical substances on the list indicated above
- Hazardous chemical substances for example asbestos dust is not cleared by using compressed air but should be vacuumed
- No person eats or drinks in a hazardous chemical substances workplace; and
- Hazardous chemical substances waste is disposed of safely in terms of hazardous waste disposal requirements.

SI 5.25 EXCAVATIONS (INCLUDING PILING)

Where excavations or any part thereof will exceed 1,5 m in depth the Principal Contractor will be required to submit a method statement to the Client for approval before commencing with the excavation and the Client will issue a permit to precede once the risk assessment and method statement is approved.

Regardless of the above, all excavation work has to comply with the following:

- Excavation work must be carried out under the supervision of a competent person with at least two years practical experience in excavation work who has been appointed in writing
- Before excavation work begins the stability of the ground must be evaluated
- Whilst excavation work is being performed, the Principal Contractor must take suitable and sufficient steps to prevent any person from being buried or trapped by a fall or dislodgement of material
- No person may be required or permitted to work in an excavation that has not been adequately shored or braced
- Where the excavation is in stable material or where the sides of the excavation are sloped back to at least the maximum angle of repose measured relative to the horizontal plane, shoring or bracing may be left out **but only after** written permission has been obtained from the appointed competent person
- Shoring and bracing must be designed and constructed to safely support the sides of the excavation and prevent it from collapsing
- Where uncertainty exists regarding the stability of the soil the opinion of a competent professional engineer or professional technologist must be obtained whose opinion will be decisive. The opinion must be in writing and signed by the engineer or technologist as well as the appointed excavator
- No load or material may be placed near the edge of an excavation if it is likely to cause a collapse of the excavation, unless suitable shoring has been installed to be able to carry the additional load
- Neighbouring/adjoining buildings, structures or roads that may be affected or endangered by the excavation must be suitably protected
- Every excavation must be provided with means of access that must be within 6 meters of any employee within the excavation at any time
- The location and nature of any existing services such as water, electricity, gas, telecommunication etcetera must be established before any excavation is commenced with and any service that may be affected by the excavation must be protected and made safe for employees working in or near in the excavation
- Every excavation, including the shoring and bracing or any other method to prevent collapse, must be inspected by the appointed competent person as follows:

    - Daily before work commences
    - After every blasting operation
    - After an unexpected collapse of the excavation or part thereof
    - After substantial damage to any support

- After rain

- The results of any inspections must be recorded in a register kept on site
- Every excavation accessible to the public or that is adjacent to a public road or thoroughfare or that threatens the safety of persons, must be adequately barricaded or fenced off to at least one meter high and as close to the excavation perimeter as practicable
- Provided with warning lights or visible boundary indicators after dark or when visibility is poor
- Upon entering an excavation the requirements of General Safety Regulation 5 must be observed:
- Any confined space may only be entered after the air quality has been tested to ensure that it is safe to breathe and does not contain any flammable or noxious air mixture.
- The confined space must be purged and ventilated of any hazardous or flammable gas, vapor, dust or fumes
- The safe atmosphere must be maintained
- Employees are to be provided with breathing apparatus and wearing a safety harness with a rope with the free end of the rope being continuously attended to by a person outside the confined space
- Furthermore, an additional person, trained in resuscitation, to be in full-time attendance immediately outside the confined space
- Additional serviceable breathing and rescue apparatus is kept immediately outside the confined space for rescue purposes
- All pipes, ducts etcetera that may leak into the confined space to be blanked off sufficiently to prevent any leakage or seepage
- The employer must ensure that all employees have left the confined space after the completion of work
- Where flammable gas is present on or in a confined space no work may be performed in close proximity to the flammable atmosphere that may ignite the flammable gas or vapor.

SI 5.26 WORKING IN CONFINED SPACES (SUCH AS MANHOLES)

SI 5.26.1 VENTILATION

The confined space or manhole cover and two adjacent covers must be opened (i.e. a total of three manholes) and the confined space or manhole be allowed to ventilate for at least 15 minutes before entering the manhole. All open manholes must be barricaded and manned at all times.

A gas monitor must be lowered to the bottom of the confined space or manhole with a rope to test the presence of any toxic/flammable gas. If any gas is detected, the space or line must be force ventilated by means of a blower for at least 15 minutes where after the air must be tested again. Under no circumstances may any space or manhole be entered while there is a toxic/flammable gas present.

After the undertaking of the necessary work, the person in charge of the activities must confirm that all the employees are accounted for and ensure that all the manholes are properly closed and barricading removed.

SI 5.26.2 LATERAL SUPPORT

Lateral support is a specialized operation. The results of the preliminary examination of the structure to be underpinned and any adjacent structure will determent the working method to be adopted.

The Engineer in charge must specify the precise plan of operations and timetable, together with a list of the necessary material and equipment.
Before the work begins all the equipment and materials required for safety measures should be provided and ready for use.

Lateral support operations should be carried out under the direction of a competent experienced person who should be in constant attendance at the site.

SI 5.26.3 ENTERING A MANHOLE

When entering a confined space or manhole, the person entering the space or manhole must wear a safety harness, fully operational gas detector as well as a self-rescuer. A lifeline must be attached to the safety harness and a person on the surface must be in continuous contact with the person in the manhole. At least one person on the surface must be trained in basic first-aid (*level 1*).

No person shall remain within a confined space or manhole for a period of more than one hour at a time. A minimum of 5 minute rest periods on the surface must be taken after this period before re-entering.

Should the alarm sound on the gas monitor, the employees must exit the confined space or manhole and the immediate area must also be evacuated immediately. The area must be properly ventilated and re-tested before re-entering the confined space or manhole. Professional support should be called for if necessary.

Employees must be provided with flameproof lighting when entering deep manholes or manholes with flammable gases. No naked lights, smoking or unprotected electrical apparatus which may cause sparks, shall be permitted in any manhole or confined space or in their vicinity.

SI 5.26.4 GENERAL

All employees working in confined spaces or manholes must be issued with fully functioning gas monitoring equipment and safety harnesses as well as self-rescuers where applicable. All these employees must be trained (including refresher training on a continuous basis) in the use thereof.
Where over-pumping between manholes is involved, only leak free pumping machines and conveyance tubes must be used and allowed.

SI 5.26.5 SAFETY EQUIPMENT

All teams must be issued with fully functional gas monitoring equipment and safety harnesses and self-rescuers where applicable. All employees must be trained *(including refresher training on a continuous basis*) in the use thereof.

SI 5.26.6 GENERAL RECORDS

The following records shall be implemented and maintained by the Principal Contractor:

- Confined space entry permits
- Confined space entry registers
- Safety harness registers

SI 5.26.7 TRAINING

All employees that have to enter a confined space or manholes must be formally trained before being required to enter such areas (new employees to complete this training before working in a confined space).

Refresher courses must be attended by employees at least every 2 years or immediately if new methodologies or equipment are adopted or acquired.

Continuous onsite training and support by supervisory staff should be undertaken.

SI 5.27 TEMPORARY WORKS

Temporary Works must be carried out under the supervision of competent person designated in writing.

Temporary Works structures must be so designed, erected, supported, braced and maintained that it will be able to support any vertical or lateral loads that may be applied.

No load may be imposed onto the structure that the structure is not designed to carry.

Temporary Works must be erected in accordance with the structural or brick wall design drawings for such Temporary Works and if there is any uncertainty, the designer must be consulted before proceeding with the erection/use of the Temporary Works.

All drawings pertaining to the Temporary Works must be kept available on site.

All equipment used in the erection of Temporary Works must be checked by a competent person before use.

The foundation or base upon which the Temporary Works is erected must be able to bear the weight and keep the structure stable.

Employees erecting Temporary Works must be trained in the safe work procedures for the erection, moving and dismantling of the Temporary Works.

Safe access and emergency escape must be provided for employees.

A competent person must inspect the Temporary Works structures that have been erected before, during and after pouring of concrete or the placing of any other load and thereafter daily until the Temporary Works is stripped. The results of all inspections must be recorded in a register kept on site.

The Temporary Works must be left in place until the designated competent person has authorised its stripping in writing.

Any damaged Temporary Works must be repaired and/or rectified without delay.

Deck panels must be secured against displacement.

The slipping of employees and other persons on release agents on deck panels must be prevented at all times.

Employees' health must be protected against the use of solvents, oils or other similar substances.

SI 5.28 DEMOLITION WORK

Demolition work must be carried out under the supervision of a competent person who has been appointed in writing.

- A detailed structural or brick wall engineering survey of the structure to be demolished must be carried out and a method statement on the procedure to be followed in demolishing the structure or brick wall must be developed by a competent person, before any demolition may be commenced
- As demolishing progresses the structural or brick wall or brick wall integrity of the structure must be checked at intervals as determined in the method statement by the appointed competent person in order to prevent any premature collapse.

Steps must be taken to ensure that where a structure or brick wall is being demolished:

- No floor, roof or any other part of the structure is overloaded with debris or material that would make it unsafe
- Precautions are taken to prevent the collapse of the structure or brick wall when any frame or support is cut or removed
- Shoring or propping is applied where necessary

- No employee is required or allowed to work under unsupported overhanging material; and
- The stability of an adjacent building, structure or brick wall or road is maintained at all times
- The location and nature of any existing services such as water, electricity, and gas etcetera must be established before any demolition is commenced with and any service that may be affected by the demolition must be protected and made safe for employees and other persons
- Every stairwell in a building being demolished must be adequately illuminated
- Convenient and safe means of access must be provided
- A catch platform or net must be erected over every entrance to the building or structure being demolished where the likelihood exists of material or debris falling on employees and/or persons entering and leaving and every other area where the likelihood exists of material or debris falling on employees and/or persons must be fenced or barricaded
- No material may be dropped on the outside of the building unless the area into which it is dropped is fenced off or barricaded.

Waste and debris may only be disposed of from a height in a chute with the following design:

- Adequately constructed and rigidly fastened
- Inclined >45 degrees and enclosed on all four sides
- Fitted with a gate or control mechanism to control the flow of material that may not freefall down the chute
- Discharged into a container or a barricaded area; and
- Demolition equipment may only be used on floors or slabs that are able to support it.

Asbestos related work must be conducted to the requirements of the Asbestos Regulations promulgated under the OHS ACT and in particular Asbestos Regulation 21, i.e.:

- Demolition of asbestos may only be carried out by a registered (*with the Department of Labour*) asbestos contractor
- All asbestos materials likely to become airborne must be identified; and
- A plan of work must be submitted for approval to an Approved Asbestos Inspection Authority (AAIA), whom is approved by the Department of Labour, 30 days prior to commencement of demolishing work unless the plan was drawn up by an AAIA and a signed *(by all parties)* copy is submitted to the Department of Labour 14 days before commencement of the demolishing.

During demolition work:

- All asbestos containing material must be disposed of safely
- Employees must be issued with appropriate PPE and the proper use thereof enforced; and
- After the demolition has been completed the area/premises must be thoroughly checked to ensure that all asbestos waste has been removed
- No employee is allowed to:
    - Use compressed air or permit the use of compressed air to remove asbestos dust from any surface or employee or person;

  - Smoke, eat, drink or keep food or beverages in an area not specifically designated for this; and
  - Apply asbestos by spraying.
- Lead related work must be conducted to the requirements of the Lead Regulations promulgated under the OHS Act
- Where demolition works will involve the use of explosives, a method statement must be developed by a competent person in accordance with applicable explosives legislation.

SI 5.29 EXPLOSIVE POWERED TOOLS

The Principal Contractor shall not use or permit any person to use an explosive powered tool, unless:

- it is provided with a protective guard around the muzzle end, which effectively confines any flying fragments or particles
- The firing mechanism is so designed that the explosive powered tool will not function unless-
- It is held against the surface with a force of at least twice its weight; and
- The angle of inclination of the barrel to the work surface is not more than 15 degrees from a right angle, provided that the provisions of this requirement will not apply to explosive powered tools in which the energy of the cartridge is transmitted to the bolts, nails or similar relevant objects by means of an intermediate piston which has a limited distance of travel.

The Principal Contractor shall ensure that:

- Only cartridges suited for the explosive powered tool and the work to be performed are used;
- The explosive powered tool is cleaned and examined daily before use and as often as may be necessary for its safe operation by a competent person who has been appointed
- That the safety devices are in proper working order prior to use
- When not in use, the explosive powered tool and the cartridges are locked up in a safe place, which is inaccessible to unauthorised persons
- The explosive powered tool is not stored in a loaded condition
- A warning notice is displayed in a conspicuous manner wherever the explosive powered tool is used
- The issuing and collection of cartridges and nails or studs are- controlled and done in writing by a person having been appointed in writing; and
- Recorded in a register and that the recipient has accordingly signed for the receipt thereof as well as the returning of any spent and unspent cartridges;

The Principal Contractor shall not permit or require any person to use an explosive powered tool unless such person has been:

- Provided with and uses suitable protective equipment; and
- Trained in the operation, maintenance and use of such tool.

SI 5.30 WELDING, FLAME CUTTING OR SIMILAR OPERATIONS

A competent person will be appointed to supervise welding, flame cutting or similar operations on site.

The following rules will govern all welding and flame cutting or similar operations:

- The welder will be trained regarding the safe use/operation of the equipment
- The welder and his assistant will be provided with effective and appropriate personal protective equipment and/or clothing
- Cables and electrode holders will be effectively insulated
- The workplace will be effectively screened off to prevent bystanders from being affected by the welding rays or they will be provided with protective equipment
- Special precautions will be taken where welding is undertaken in confined spaces e.g. proper and sufficient ventilation will be provided
- In wet or damp conditions the welding equipment and the welder will be properly insulated and someone will be on standby to assist in the event of any emergency
- A qualified person will certify in writing that it is safe to enter and work in a specific confined space before welding or flame cutting is undertaken
- No welding, flame cutting, grinding, soldering or similar work shall be undertaken in respect of any drum, vessels or similar object or container where such object or container:

    - Is completely closed, unless the rise in internal pressure cannot render in dangerous; or
    - Contains any substance which, under the action of heat may explode or react to form dangerous or poisonous substances.

- Where pressure vessels/welding cylinders containing oxygen or acetylene are transported or used, the proper precautionary measures will be taken against bumping, falling, rolling etcetera.
- Gas welding hoses may only be joined with approved connectors and clamps
- No oil or grease may be applied to oxygen valves and fittings
- It is a sound practice to store pressure vessels and/or welding cylinders vertically and to secure them by means of a chain
- Acetylene cylinders may never be inclined in excess of 45º
- Proper and adequate fire prevention measures will be instituted and maintained for as long as the welding continues; and
- Where explosive and/or flammable vapors are present, welding will be done under "*hot work*" permits.

SI 5.31 TRANSPORTATION OF EMPLOYEES

Any vehicle used to transport employees must have seats firmly secured and adequate for the number of employees to be carried.

The Principal Contractor shall not allow employees to be transported in a goods vehicle unless the portion of the vehicle in which the employees are being conveyed is enclosed to a height of:

- at least 350 mm above the surface on which employees are seated; or
- at least 900 mm above the surface on which employees are standing,

in a manner and with a material of sufficient strength to prevent employees from falling from such vehicle when it is in motion.

SI 5.32 PILING DRIVING OPERATIONS

The Contractor appointed to do Piling Driving Operations will be competent and will also appointed.

The area where Piling Driving Operation is to be done will be barricaded. The necessary signs will be promptly displayed.

Daily checklist will be completed on piling machines and operators will comply with Construction Regulation 23(1)(k).

The Method statement and Risk assessment will be available.

SI 5.33 HEALTH AND SAFETY POLICY

The Principal Contractor has to provide the Client, as an annexure to the Health and Safety Plan, with a detailed Health and Safety Policy outlining the Principal Contractor's stance on and principles adopted for Health and Safety.

SI 5.34 COST FOR HEALTH AND SAFETY MEASURES DURING THE CONSTRUCTION PROCESS

To ensure that the appointed Principal Contractor comply with Construction Regulation 5 (1) (g) and have made provision for the cost of Health and Safety measures during the construction process.

SI 5.35 SITE ACCESS

The owner of any land on which excavation work is in progress or on any building is erected or demolished shall take precautions in the working area and on surrounding roads and footways to limit to a reasonable level the amount of dust arising from the work or surroundings thereof.

Access will be through the contractor's entrance. **Proper site identification must be issued to all workers**.

No person shall during the course of any building, demolition or excavation work use any machine, machinery, engine, apparatus, tool or contrivance, which in the opinion of the local authority may unreasonably disturb or interfere with the amenity of the neighbourhood.

The working hours state in Regulation F6 (2) (a) of the National Building Regulations and Building Standards 103/1977 to be strictly obeyed:

i. Working hours: Monday – Friday before 07:00 or after 18:00 on any day other than those days contemplated in subparagraphs ii and iii.
ii. Saturdays: before 07:00 or after 15:00.
iii. Public Holidays & Sundays: no work.

- Working on site outside these hours is prohibited unless arrangements have been made with the Project Manager for competent supervision and the correct equipment will be on site.
- The site will be adequately fenced or hoarded and access to the site shall be controlled, signs will be placed on gates/ fence warning public of construction area. All visitors/ deliveries shall be recorded in the visitor's book in site/ foreman office.

SI 5.36 SITE ORGANOGRAM

The Principal Contractor will display a site organogram and a comprehensive and updated list of all the Contractors on site accountable to the Principal Contractor, the agreements between the parties and the type of work being done are included and available in the site office.

SI 5.37 DUTY TO INFORM

The Principal Contractor will inform the CLIENT of any information that is not covered in the Health and Safety Specifications.

SI 6 MEASUREMENT AND PAYMENT

SI 6.1 MEASUREMENT AND PAYMENT

SI 6.1.1 The scheduled items for health and safety will be included in the preliminary and general section of the schedule of quantities. Measurement will be in terms of Clause 8.1.2 of SANS 1200 A.

SI 6.1.2 The Contractor shall price all items scheduled in this section of the schedule of quantities to enable the Employer to comply with clause 5.1(g) of the Construction Regulations, 2014. Failure by the Contractor to price these items will force the Employer to reject the Contractor's tender in terms of clause 5.1(h) of the Construction Regulations, 2014.

SI 6.1.3 Payment for the scheduled items will be in terms of clause 8.2 of SANS 1200 A.

SI 6.2 SCHEDULING ITEMS

SI 6.2.1 FIXED-CHARGE ITEMS

a) Preparation of Health and Safety Plan…….……...Unit: Sum

The sum shall cover all costs involved in the preparing the Health and Safety Plan (which includes the risk assessment), which shall include the preparation of all permit applications and notifications as required by this specification and shall include the employment cost of all health and safety personnel employed for the preparation of the Contractor's Health and Safety Plan.

b) Health and Safety Training (site specific and other) ……..……..Unit: sum

The sum shall cover all costs involved in preparation of all the necessary Health and Safety Induction Training materials required from the training of the Contractor's employees, Subcontractors and all visitors to the Works.

c) Personal Protective Clothing and equipment…….……..…….……Unit: Sum

The sum shall cover all costs involved in the initial provision of all personal protective clothing and equipment for the Contractor's employees and Subcontractors and any visitors to the Works, as required by this specification (which includes the requirements of the Occupational health and Safety Act, 1993 and its regulations, as amended)

d) Fences, Signs and Barricades…….……..…….…… Unit: Sum

The sum shall cover all costs involved in the initial provision of all fences, signs and barricades necessary for the protection of all persons, plant, vehicles, equipment or facilities, as required by this specification (which includes the requirements of the Occupational Health and Safety Act, 1993 and its regulations, as amended)

e) Establishment of Safety Administration…….……..…….…… Unit: Sum

The sum shall cover all costs involved in establishment of all administrative matters required by this specification which shall include, but not be limited to, the establishment of the Health and Safety File.

f) Other Health and safety Fixed-charge Obligations…….……..…….……Unit: Sum

The sum shall cover the fixed costs of all other obligations that are required for the safe execution of the Works in accordance with the requirements of this specification and that are not specifically covered in 10.2.1(a),(b),(c),(d) or (e).

SI 6.2.2 TIME-RELATED ITEMS

a) Implementation and maintenance of Health and Safety Plan…….……..….. Unit: Month

The rate shall cover all the monthly costs involved in the implementation and maintenance of the Health and Safety Plan. This shall include but shall not be limited to the following:

1) The employment cost of all health and safety personnel including consultants, health and safety officers, inspectors, supervisors and issuers required in terms of the Contractor's Health and safety Plan,
2) Updating the Health and safety Plan as needed.
3) Carrying out of periodic audits and follow-up audits,
4) Compilation of ongoing risk assessments and risk assessment reports as are required by the Works,
5) Convening of regular safety meetings with the Safety Representatives,
6) Accompanying and supporting the Employer or his Safety Agent during ad hoc audits,
7) Compilation of monthly safety reports and statistics for the Employer or his Safety Agent.

b) Implementation and maintenance of Training…….……..…….……Unit: Month

The rate shall cover all the monthly costs involved in the implementation of the induction training of the Contractor's employees, Subcontractors and all visitors to the Works.

c) Maintenance of Personal Protective Clothing and Equipment…….……..…Unit: Month

The rate shall cover all the monthly costs involved in maintenance, repair or replacement of personal protective clothing required by the Contractor's employees or Subcontractors and all visitors to the Works.

d) Maintenance of Fences, Signs and Barricades……..……...……Unit: Month

The rate shall cover all the monthly costs involved in maintenance, repair or replacement for whatever reason of fences, signs and barricades used for the Works. The rate shall include for the provision of security guards for the safeguarding of the items provided should this be necessary.

e) Implementation and maintenance of Safety Administration……..……...……Unit: Month

The rate shall cover all the monthly costs involved in establishment of all administrative matters required by his specification which shall include, but not limited to, the maintenance of the Health and Safety File or the completion and recording of the safety check lists required by this specification.

f) Other Health and Safety Time-related Obligations……..……...……Unit: Month

The rate shall cover all the monthly time-related costs of all other obligations that are required for the proper execution of the Works in accordance with the requirements of this specification and that are not specifically covered in 10.2.2(a), (b), (c), (d) or (e).

SI 7 MANDATARY AGREEMENT BETWEEN CLIENT AND PRINCIPAL CONTRACTOR

OCCUPATIONAL HEALTH & SAFETY ACT 85 of 1993
CONSTRUCTION REGULATIONS 2014

AGREEMENT WITH MANDATARY

In terms of Section 37(1) & (2)

WRITTEN AGREEMENT ENTERED INTO AND BETWEEN

_____

(Hereinafter referred to as Client)

AND

_____

(Principal Contractor)

AGREEMENT WITH MANDATARY TO BE COMPLETED IN BLACK INK AND EACH PAGE AND ANY CHANGE MADE TO BE INITIALLED

Occupational Health & Safety Act of 1993 and Construction Regulations 2014

Requirements:

1. Your attention is drawn to "General Duties of Employers to their Employees" as required by Section 8 of the Act
2. You are required to:

2.1 Sign a written "Agreement with Mandatary" as required by Sect 37(1)) 2) of the Act before commencing any work on site.

2.2 Ensure that all your employees receive the necessary Induction Training and have proof of thereof.
Note: *You must ensure that all employees under your control are informed, instructed and trained by a competent person regarding any hazard and the related work procedures before any work commences.*

2.3 Ensure the provision of Welfare Facilities for your employees as per Construction Regulation 30.

2.4 Provide the Client with your SHE Plan.

2.5 Ensure that Method Statements, Risk Assessments and Safe Work Procedures are done and available.

2.6 Provide the Client with written appointment of the person who is going to supervise the construction per Construction Reg. 8(7).

2.7 Provide the Client with written designation of your nominated Health & Safety Representative as per Section 17(1).
Note: *Your Health & Safety Representative will be expected to attend the Client safety meetings.*

2.8 If you employ more than five (5) persons, you are required to provide your own First Aid Box GSR 3(2).

2.9 If you employ more than ten (10) persons, you are required to provide your own qualified First Aider as per GSR 3(4).
Note*: If you have difficulty in complying with items 2.7 & 2.8 above, you may arrange/come to an agreement with the Client to make use of his First Aid facilities in case of injury. You will be expected to communicate such an agreement to your employees.*

2.10 When working with Hazardous Chemical Substances, comply with HCS Reg. 3.
Note: Asbestos and Lead Regulations are separate.

2.11 When using a Materials Hoist, comply with the requirements of Construction Reg. 19.

2.12 When using Lifting Machines & Lifting Tackle, comply with DMR. 18.
Note*: You may be required to appoint a Banksman to control Lifting / Slinging operations.*

2.13 When erecting / using Scaffolding comply with the requirements of SANS 10085 "Access Scaffolding".

2.14 When erecting / using Suspended Platforms comply with the requirements of Construction Reg. 17.

2.15 When doing Demolition Work, comply with Construction Reg. 14.

2.16 When doing Blasting to comply with Explosives Regulations Chapter 10.

2.17 When doing Excavation Work, comply with Construction Reg. 13.

2.18 When doing Electrical Installations, comply with the requirements of Construction Reg. 24.
Note: *Electrician to provide copy of registration as per Elect. Install. Reg. 9(3).*

2.19 When using Construction Vehicles, comply with Construction Reg. 23.

2.20 When using / erecting Temporary Works, comply with Construction Reg.12.

2.21 When working over or in close proximity to Water, comply with Construction Reg.26.

2.22 Ensure that good Housekeeping, Stacking & Storage principles are applied on this project as per Construction Reg. 27 & 28.

2.23 Ensure that appropriate measures are taken to avoid the risk of Fire / Explosion and comply with requirements of Construction Reg. 29.

2.24 If you are going to work at heights a Fall Protection Plan must be submitted (roof work included) as per requirements of Construction Reg. 10.
2.25 When using Explosive Powered Tools, comply with GSR 19.
2.26 When Welding, Flame Cutting / Soldering, comply with GSR 9.
2.27 When working in Confined Spaces, comply with GSR 5.
3 You are responsible for providing your own **legal safety documents** and **registers** to comply with the Act's requirements. *A copy of the OHS Act of 1993 and the Construction Regulations 2014 will be available for perusal in the Client's **site** office.*
4 You are required to comply with General Safety Regulation 2(1) to (7) and provide your employees with personal protective equipment which will allow them to carry out their work in a safe manner, e.g. hard hats, safety harnesses, gloves, safe footwear, eye protection, ear protection, waterproof clothing etc.
5 Reporting of Incidents and Occupational Diseases shall be done as per General Admin. Regulation 8 (Also see Sect 24 of the Act).
6. Compensation for Occupational Injuries & Diseases Act (No 130 of 1993). You are required to provide the Client/Client with proof of registration with the Compensation Commissioner/Federated Employer(s) Mutual when signing this agreement. If you are not registered, the Client/Client may deduct the necessary amounts from your progress payments and pay it over to the Commissioner to ensure that you are insured. **See Section 80 & 89 of the COID Act.**

Signature: _____ Signature: _____
(Client) (Principal Contractor)

AGREEMENT WITH MANDATARY

In terms of Section 37(1) and (2)

Definition of Mandatary

- Includes an agent, a contractor or sub-contractor for work, but without derogating from his status in his own right as an employer or user

Section 37(1) Whenever an employee does or omits to do any act, which it would be an offence in terms of this Act for the employer of such employee or a user to do or omit to do, then, unless it is proved that-

(a) in doing or omitting to do that act the employee was acting without the connivance or permission of the employer or any such user;
(b) it was not under any condition or in any circumstance within the scope of the authority of the employee to do or omit to do an act, whether lawful or unlawful, of the character of the act or omission charged; and
(c) all reasonable steps were taken by the employer or any such user to prevent any act or mission of the kind in question, the employer or any such user himself shall be presumed to have done or omitted to do

that act, and shall be liable to be convicted and sentenced in respect thereof; and the fact that he issued instructions forbidding any act or omission of the kind in question shall not, in itself, be accepted as sufficient proof that he took all reasonable steps to prevent the act or omission.

Section 37(2) The provisions of subsection (1) shall *mutatis mutandis* apply in the case of a mandatary of any employer or user, **except if the parties have agreed in writing to the arrangements and procedures between them** to ensure compliance by the mandatary with the provisions of this Act.

ACCEPTANCE OF MANDATARY

In terms of the provisions of Section 37(2) of the Occupational Health & Safety Act 1993

I, _____

acting for and on behalf of

_____ **(Company/Close Corporation/ Enterprise/Owner /User)** undertake to ensure that the requirements and provisions of the Act and Regulations are complied with.

Signature: _____ Print Name: _____
(Principal Contractor)

Designation: _____ Date: _____

Mandatary-Workmen's Compensation/Federated Employers Mutual No.: _____

A copy of company/Close corporation "Letter of Good Standing" to be attached.

Signature: _____ Print Name: _____
(Client**)**

Designation: _____ Date: _____

Company: _____

Project / Site: _____

CLIENT

Construction Regulation 5

5(1) A client must:

(a) prepare a baseline risk assessment for an intended construction work project;
(b) prepare a suitable, sufficiently documented and coherent site specific health and safety specification for the intended construction work based on the baseline risk assessment contemplated in paragraph (a)
(k) to appoint each Principal Contractor in writing for the project or part thereof on a construction site

APPOINTMENT

I (Client), _____

of: (Company) _____

appoint (Name): _____

as the Principal Contractor for PROJECT/SITE:

_____

_____

CONSTRUCTION COMPANY / CLOSE CORPORATION:

_____

Your attention is drawn to the following requirements:

1. Ensure that the Provincial Director is notified of the intended construction work.
2. Provide the Client with a suitable and sufficiently documented health & safety plan, based on the Client's documented H & S specifications.
3. Take reasonable steps to ensure co-operation between all contractors so as to enable compliance with the Construction Regulations.
4. Provide appointed Contractors with the applicable sections of the health & safety specifications pertaining to their work.
5. Appoint each Contractor in writing for the construction work he/she has to carry out.
6. Take reasonable steps to ensure compliance by Contractors which shall include monthly safety audits

_____

Contractor	*Witness 1*	*Witness 2*	*Employer*	*Witness 1*	*Witness 2*

7. Stop any Contractor from executing work which is not in compliance with safety specifications or poses a threat to other persons.
8. Ensure that where changes are brought about to the design / construction, sufficient health & safety information and appropriate resources are made available to Contractors to execute their work safely.
9. Ensure that every Contractor is registered and in good standing with the Compensation Commissioner.
10. Ensure that potential Contractors, submitting tenders have made provision for the cost for health & safety during construction.
11. Ensure that a health & safety file, with all documentation required in terms of the Act & Regulations is open & kept available on site.
12. Keep a comprehensive and updated list of all Contractors accountable to the Client; as well as all agreements between the parties and the type of work to be done.
13. On completion of construction work, hand over a consolidated health & safety file to the Client.
14. Notify the Client of all incidents that have to be reported, recorded and investigated as per Sec. 24 of the Act and Gen. Adm. Reg. 8.
15. Ensure that method statements, risk assessments and safe work procedures are in place before commencement of construction work.
16. Ensure that all employees, including those of Contractors, undergo health & safety induction training pertaining to the construction hazards and be in possession of proof of the health & safety induction training given.

Signature: _____ Date: _____
(Client)

Designation: _____

ACCEPTANCE OF APPOINTMENT

I,_____Designation: _____
(Principal Contractor)

hereby accept the requirements of this appointment.

Signature: _____

Date: _____

TECHNICAL SPECIFICATION

PAB ELECTRICAL INSTALLATIONS

CONTENTS

PAB 01 SCOPE

PAB 01.01 This specification comprises all aspects regarding the construction of building electrical systems. Building electrical systems comprise:

(i) Compressor supply cables
(ii) Distribution boards and low voltage cable
(iii) Small power and fixed appliances
(iv) Earthing and lightning protection system
(v) Busbar Systens

PAB 01.02 This specification shall form an integral part of the ERWAT Wastewater Care Works contract document and shall be read in conjunction with other Additional Specifications included in the Bid Document.

PAB 02 STANDARD SPECIFICATIONS, REGULATIONS, CODES AND ADDITIONAL SPECIFICATIONS

PAB 02.01 The latest edition, including all amendments up to date of tender of the following specifications, publication and codes of practice shall be read in conjunction with this specification and shall be deemed to form part thereof.

PAB 02.02 SANS SPECIFICATIONS

General	Distribution and meter boards	LV cables and conductors	Lighting system	Earthing and lightning protection system	Small power installation	
					Power outlets	Conduits, powerskirting, cable trays and ducting
SANS 10142	SANS 152		SANS 10114	SANS 03	SANS 152	SANS 950
SANS 10160	SANS 156	SANS 10198	SANS 163	SANS 10199	SANS 164	SANS 1065
SANS 10400	SANS 172	SANS 1411	SANS 1012		SANS 1084	SANS 1085
SANS 1222		SANS 1507	SANS 1084	**Speed Drives**	SANS 1239	
			SANS 1250			
			SANS 1279	SANS61800		
			SANS 1777			
			SANS 10114			

PAB 02.03 OCCUPATIONAL HEALTH AND SAFETY ACT OF 1993: CONSTRUCTION REGULATIONS, 2003 AS PROMULGATED IN GOVERNMENT GAZETTE NO 25207 AND REGULATION GAZETTE NO 7721 OF 18 JULY 2003

PAB 02.04 MANUFACTURER'S SPECIFICATIONS AND INSTALLATION INSTRUCTIONS

PAB 02.05 ADDITIONAL REQUIREMENTS

Equipment and material installed shall be new and unused.

Luminaires, control gear, isolators and power outlets shall bear the SANS stamp. The Contractor shall ensure that all safety regulations and measures are applied and enforced during repair and maintenance work on cabling, wiring, distribution boards, luminaires, power points and fixed appliances.

PAB 03 TEST AND INSPECTION FOLLOWING COMPLETION OF CONSTRUCTION WORK

PAB 03.01 All systems are to be checked by the Contractor prior to commissioning. Copies of all checks for each installation shall be presented to the Engineer for approval before commissioning takes place.

PAB 03.02 It is the responsibility of the Contractor to provide all labour, accessories and properly calibrated and certified measuring instruments necessary to record the following parameters:

PAB 03.02.01 continuity of ring final circuit conductors
PAB 03.02.02 continuity of protective conductors, including main and supplementary equipotential bonding
PAB 03.02.03 earth electrode resistance
PAB 03.02.04 insulation resistance
PAB 03.02.05 polarity
PAB 03.02.06 earth fault loop impedance
PAB 03.02.07 operation of residual current devices
PAB 03.02.08 phase voltage
PAB 03.02.09 current per phase
PAB 03.02.10 illumination levels in lux

PAB 03.03 The Contractor is responsible for the arrangement of such tests. He shall give at least 72 hours notice to the Engineer prior to the test date.

PAB 04 QUALITY ASSURANCE SYSTEM

PAB 04.01 Following formal approval of his Quality Assurance system by Engineer, the Contractor shall implement the approved QA system.

PAB 04.02 Records of this QA system shall be kept throughout the duration of the contract and shall be submitted to the Engineer as required by the Engineer.

PAB 05 COMMISSIONING OF INSTALLATION

PAB 05.01 On completion of the repair work, the contractor shall check and put all systems into operation.

PAB 05.02 All commissioning shall be performed by the Contractor, to the satisfaction of the Engineer. The Contractor shall confirm in writing that all systems have been repaired according to specification and are fully operational.

PAB 05.03 All installations shall be energised for a minimum continuous period of 96 hours immediately prior to the Engineer's Practical Completion inspection to verify lamp stability and reliability of power reticulation

PAB 06 QUALITY SPECIFICATION FOR MATERIAL AND EQUIPMENT

PAB 06.01 TESTS

After completion of the works and before first delivery is taken, a full test will be carried out on the installation for a period of sufficient duration to determine the satisfactory working thereof. During this period the installations will be inspected and the Contractor shall make good, to the satisfaction of the Representative/Agent, any defects which may arise.

The Contractor shall provide all instruments and equipment required for testing and any water, power and fuel required for the commissioning and testing of the installations at completion.

PAB 06.02 NOTICES AND FEES

The Contractor shall give all notices required by and pay all necessary fees, including any inspection fees, which may be due to the local Supply Authority.

On production of the official account, only the net amount of the fee charged by the Supply Authority for connection of the installation to the supply mains, will be refunded to the Contractor by the Engineer.

PAB 06.03 SCHEDULE OF FITTINGS

In all instances where schedule of light, socket outlet and power points are attached to or included on the drawings, these schedules are to be regarded as forming part of the specification.

PAB 06.04 QUALITY OF MATERIALS

Only materials of first class quality shall be used and all materials shall be subject to the approval of the Engineer.

Wherever applicable the material is to comply with the relevant South African Bureau of Standards, specifications, or to British Standard Specifications, where no SANS Specifications exist.

Materials wherever possible, must be of South African manufacture.

PAB 06.05 CONDUIT AND ACCESSORIES

The type of conduit and accessories required for the service, i.e. whether the conduit and accessories shall be of the screwed type, plain-end type or of the non-metallic type and whether metallic conduit shall be black enamelled or galvanised, is specified in Part 2 of this specification.

Unless other methods of installation are specified for certain circuits, the installation shall be in conduit throughout. No open wiring in roof spaces or elsewhere will be permitted.

The conduit and conduit accessories shall comply fully with the applicable SABS specifications as set out below and the conduit shall bear the mark of approval of the South African Bureau of Standards.

- Screwed metallic conduit and accessories: SABS 1065, parts 1 and 2
- Plain-end metallic conduit and accessories: SABS 1065, parts 1 and 2
- Non-metallic conduit and accessories: SANS 950.

All conduit fittings except couplings, shall be of the inspection type. Where cast metal conduit accessories are used, these shall be of malleable iron. Zinc base fittings will not be allowed.

Bushes used for metallic conduit shall be brass and shall be provided in addition to locknuts at all points where the conduit terminates at switchboards, switch-boxes, draw-boxes, etc.

Draw-boxes are to be provided in accordance with the “Wiring Code” and wherever necessary to facilitate easy wiring.

For light and socket outlet circuits, the conduit used shall have an external diameter of 20mm. In all other instances the sizes of conduit shall be in accordance with the “Wiring Code” for the specified number and size of conductors, unless otherwise directed in part 2 of this specification or indicated on the drawings.

Only one manufactured type of conduit and conduit accessories will be permitted throughout the installation.

Running joints in screwed conduit are to be avoided as far as possible and all conduit systems shall be set or bent to the required angles. The use of normal bends must be kept to a minimum with exception of larger diameter conduits where the use of such bends is essential.

All metallic conduit shall be manufactured of mild steel with a minimum thickness of 1,2mm for plain-end conduit and 1,6mm in respect of screwed conduit.

Under no circumstances will conduit having a wall thickness of less than 1,6mm be allowed in screeding laid on top of concrete slabs.

Bending and setting of conduit must be done with special bending apparatus manufactured for the purpose and which are obtainable from the manufacturers of the conduit systems. Damage to conduit resulting from the use of incorrect bending apparatus or methods applied must on indication by the Engineer’s inspectorate staff, be completely removed and rectified and any wiring already drawn into such damaged conduits must be completely renewed at the Contractor’s expense.

Conduit and conduit accessories used for flame-proof or explosion proof installations and for the suspension of luminaires as well as all load bearing conduit shall in all instances be of the metallic screwed type.

All conduit and accessories used in areas within 50 km of the coast shall be galvanised to SABS 763.

Tenderers must ensure that general approval of the proposed conduit system to be used is obtained from the local electricity supply authority prior to the submission of their tender. Under no circumstances will consideration be given by the Engineer to any claim submitted by the Contractor, which may result from a lack of knowledge in regard to the supply authority's requirements.

PAB 06.06 CONDUIT IN ROOF SPACES

Conduit in roof spaces shall be installed parallel or at right angles to the roof members and shall be secured at intervals not exceeding 1,5m by means of saddles screwed to the roof timbers.

Nail or crampets will not be allowed.

Where non-metallic conduit has been specified for a particular service, the conduit shall be supported and fixed with saddles with a maximum spacing of 450 mm. The Contractor shall supply and install all additional supporting timbers in the roof space as required.

Under flat roofs, in false ceilings or where there is less than 0,9m of clearance, or should the ceilings be insulated with glass wool or other insulating material, the conduit shall be installed in such a manner as to allow for all wiring to be executed from below the ceilings.

Conduit runs from distribution boards shall, where possible terminate in fabricated sheet steel draw-boxes installed directly above or in close proximity to the boards.

PAB 06.07 SURFACE MOUNTED CONDUIT

The conduit installation shall be surface mount as there is no building work on this contract. Conduit installed on the surface must be plumbed or levelled and only straight lengths shall be used.

The use of inspection bends is to be avoided and instead the conduit shall be set uniformly and inspection coupling used where necessary.

No threads will be permitted to show when the conduit installation is complete, except where running couplings have been employed.

Running couplings are only to be used where unavoidable, and shall be fitted with a sliced couplings as a lock nut.

Conduit is to be run on approved spaced saddles rigidly secured to the walls.

Alternatively, fittings, tees, boxes, couplings etc., are to be cut into the surface to allow the conduit to fit flush against the surface. Conduit is to be bedded into any wall irregularities to avoid gaps between the surface and the conduit.

Crossing of conduits is to be avoided, however, should it be necessary purpose-made metal boxes are to be provided at the junction. The finish of the boxes and positioning shall be in keeping with the general layout.

Where several conduits are installed side by side, they shall be evenly spaced and grouped under one purpose-made saddle.

Distribution boards, draw-boxes, industrial switches and socket outlets etc., shall be neatly recessed into the surface to avoid double sets.

In situations where there are no ceilings the conduits are to be run along the wall plates and the beams.

Painting of surface conduit shall match the colour of the adjacent wall finishes.

Only approved plugging materials such as aluminium inserts, fibre plugs, plastic plugs, etc., and round-head screws shall be used for fixing saddles, switches, socket outlets, etc., to walls, wood plugs and the plugging in joints in brick walls are not acceptable.

PAB 06.08 CONDUIT IN CONCRETE SLABS

In order not to delay building operations the Contractor must ensure that all conduits and other electrical equipment which are to be cast in the concrete columns and slabs are installed in good time.

The Contractor shall have a representative in attendance at all times when the casting of concrete takes place.

Draw-boxes, expansion joint boxes and round conduit boxes are to be provided where necessary. Sharp bends of any nature will not be allowed in concrete slabs.

Draw and/or inspection boxes shall be grouped under one common cover plate, and must preferable be installed in passages or male toilets.

All boxes, etc., are to be securely fixed to the shuttering to prevent displacement when concrete is cast. The conduit shall be supported and secured at regular intervals and installed as close as possible to the neutral axis of concrete slabs and/or beams.

Before any concrete slabs are cast, all conduit droppers to switchboards shall be neatly spaced and rigidly fixed.

PAB 06.09 FLEXIBLE CONNECTIONS FOR CONNECTING UP OF MACHINES, ETC

Flexible tubing connections shall be of galvanised steel construction, and in damp situations of the plastic sheathed galvanised steel type. Other types may only be used subject to the prior approval of the Engineer's site electrical representative.

Connectors for coupling onto the flexible tubing shall be of the gland or screw-in types, manufactured of either brass or cadmium or zinc plated mild steel, and the connectors after having been fixed onto the tubing, shall be durable and mechanically sound.

Aluminium and zinc alloy connectors will not be acceptable.

PAB 06.10 WIRING

Except where otherwise specified in Part 2 of this specification, wiring shall be carried out in conduit throughout. Only one circuit per conduit will be permitted.

No wiring shall be drawn into conduit until the conduit installation has been completed and all conduit ends provided with bushes. All conduits to be clear of moisture and debris before wiring is commenced.

Unless otherwise specified in Part 2 of this specification or indicated on the service drawings, the wiring of the installation shall be carried out in accordance with the "Wiring Code". Further to the requirements concerning the installation of earth conductors to certain light points as set out in the "Wiring Code", it is a specific requirement of this document that where plain-end metallic conduit or non-metallic conduit has been used, earth conductors must be provided and drawn into the conduit with the main conductors to all points, including all luminaires and switches throughout the installation.

Wiring for lighting circuits is to be carried out with 2,5mm² conductors and a 2,5mm²-earth conductor. For socket outlet circuits the wiring shall comprise 4mm² conductors and a 2,5mm²-earth conductor. In certain instances, as will be directed in Part 2 of this specification, the sizes of the aforementioned conductors may be increased for specified circuits. Sizes of conductors to be drawn into conduit in all other instances, such as feeders to distribution boards, power points etc., shall be as specified elsewhere in this specification or indicated on the drawings. Sizes of conductors not specified must be determined in accordance with the "Wiring Code".

The loop-in system shall be followed throughout, and no joints of any description will be permitted.

The wiring shall be done in PVC insulated 600/1000 V grade cable to SABS 150.

Where cable ends connect onto switches, luminaires etc., the end strands must be neatly and tightly twisted together and firmly secured. Cutting away of wire strands of any cable will not be allowed.

PAB 06.11 SWITCHES AND SOCKET OUTLETS

All switches and switch-socket outlet combination units shall conform to the Quality Specifications, which form part of this specification.

No other than 16 A 3 pin sockets are to be used, unless other special purpose types are distinctly specified or shown on the drawings.

All light switches shall be installed at same positions to existing.

PAB 06.12 SWITCHGEAR

Switchgear, which includes circuit breakers, iron-clad switches, interlocked switch-socket outlet units, contactors, time switches, etc., is to be in accordance with the Quality Specifications which form part of this specification and shall be equal and similar in quality to such brands as may be specified.

For uniform appearance of switchboards, only one approved make of each of the different classes of switchgear mentioned in the Quality Specifications shall be used throughout the installations. Contractor to note that all switchgear to match existing and any other type shall be approved by site representative and/or engineer

PAB 06.13 SWITCHBOARDS

All boards shall be in accordance with the types as specified, be constructed according to the detail or type drawings and must be approved by the Engineer before installation.

In all instances where provision is to be made on boards for the supply authority's main switch and/or metering equipment the contractor must ensure that all requirements of the authorities concerned in this respect are met.

Any construction or standard type aboard proposed, as an alternative to that specified must have the prior approval of the Engineer.

All busbars, wiring, terminals, etc., are to be adequately insulated and all wiring is to enter the switchgear from the back of the board. The switchgear shall be mounted within the boards to give a flush front panel. Cable and boxes and other ancillary equipment must be provided where required.

Clearly engraved labels are to be mounted on or below every switch. The working of the labels in English, is to be according to the lay-out drawings or as directed by the Engineer's representative and must be confirmed on site. Flush mounted boards to be installed with the top of the board 2,0m above the finished floor level.

PAB 06.14 WORKMANSHIP AND STAFF

Except in the case of electrical installations supplied by a single-phase electricity supply at the point of supply, an accredited person shall exercise general control over all electrical installation work being carried out.

The workmanship shall be of the highest grade and to the satisfaction of the Engineer.

All inferior work shall, on indication by the Engineer's inspecting officers, immediately be removed and rectified by and at the expense of the Contractor.

PAB 06.15 CERTIFICATE OF COMPLIANCE

On completion of the service, a certificate of compliance must be issued to the Engineer's Representative/Agent in terms of the Occupational Health and Safety Act, 1993 (Act 85 of 1993).

PAB 06.16 EARTHING OF INSTALLATION

Main earthing

The type of main earthing must be as existing or required by the supply authority if other than the Engineers, and in any event as directed by the Engineer's representative, who may require additional earthing to meet test standards.

Alternatively or additionally earth rods or trench earths may be required as specified or directed by the Engineer's authorised representative.

Installations shall be effectively earthed in accordance with the "Wiring Code" and to the requirements of the supply authority. All earth conductors shall be stranded copper with or without green PVC installation.

Sub-distribution boards

A separate earth connection shall be supplied between the earth busbar in each sub-distribution board and the earth busbar in the Main Switchboard. These connections shall consist of a bare or insulated stranded copper conductors installed along the same routes as the supply cables or in the same conduit as the supply conductors. Alternatively armoured cables with earth continuity conductors included in the armouring may be utilised where specified or approved.

Sub-circuits

The earth conductors of fall sub-circuits shall be connected to the earth busbar in the supply board in accordance with SANS 10142.

Ring Mains

Common earth conductors may be used where various circuits are installed in the same wire way in accordance with SANS 10142. In such instances the sizes of earth conductors shall be equivalent to that of the largest current carrying conductor installed in the wire way, alternatively the size of the conductor shall be as directed by the Engineer. Earth conductors for individual circuits branching from the ring main shall by connected to the common earth conductor with T-ferrules or soldered. The common earth shall not be broken.

Non-metallic Conduit

Where non-metallic conduit is specified or allowed, the installation shall comply with the Engineer's standard quality specification for "conduit and conduit accessories".

Standard copper earth conductors shall be installed in the conduits and fixed securely to all metal appliances and equipment, including metal switch boxes, socket-outlet boxes, draw-boxes, switchboards, luminaires, etc. The securing of earth conductors by means of self-threading screws will not be permitted.

Flexible Conduit

An earth conductor shall be installed in all non-metal flexible conduit. This earth conductor shall not be installed externally to the flexible conduit but within the conduit with the other conductors. The earth conductor shall be connected to the earth terminals at both ends of the circuit.

Connection

Under no circumstances shall any connection points, bolts, screws, etc., used for earthing be utilised for any other purpose. It will be the responsibility of the Contractor to supply and fit earth terminals or clamps on equipment and materials that must be earthed where these are not provided.

Unless earth conductors are connected to proper terminals, the end shall be tinned and lugged.

PAB 06.17 MOUNTING AND POSITIONING OF LUMINAIRES

The Contractor is to note that in the case of replacement of faulty light fittings, contractor to ensure that as far as possible the luminaires are symmetrically positioned with regard to the existing pattern.

The layout of the luminaires as indicated on the drawings must be adhered to as far as possible and must be confirmed with the Engineer's representative.

Fluorescent luminaires installed against concrete ceilings shall be screwed to the outlet boxes and in addition 2 x 6mm expansion or other approved type fixing bolts are to be provided. The bolts are to be ¾ of the length of the luminaires apart.

Fluorescent luminaires to be mounted on board ceilings shall be secured by means of two 40mm x No. 10 round head screws and washers. The luminaires shall also be bonded to the circuit conduit by means of locknuts and brass bushes. The fixing screws are to be placed ¾ of the length of the fitting apart.

Earth conductors must be drawn in with the circuit wiring and connected to the earthing terminal of all fluorescent luminaires as well as other luminaires exposed to the weather in accordance with the "Wiring Code".

Incandescent luminaires are to be screwed directly to outlet boxes in concrete slabs. Against board ceilings the luminaires shall be secured to the brandering or joists by means of two 40mm x No. 8 round head screws.

PAB 07 INSTALLATION TECHNICAL DETAILS

PAB 07.01 CABLE SLEEVE PIPES

Where cables cross under roadways, other services and where cables enter buildings, the cables shall be installed in asbestos-cement pipes, earthenware or high-density polyethylene pipes.

The ends of all sleeves shall be sealed with a non-hardening watertight compound after the installation of cables. All sleeves intended for future use shall likewise be sealed.

PAB 07.02 NOTICES

The Contractor shall issue all notices and make the necessary arrangements with relevant authorities as may be required with respect to the installation.

PAB 07.03 ELECTRICAL EQUIPMENT

All equipment and fittings supplied must be in accordance with the attached quality specification (Part 3 of this document), suitable for the relevant supply voltage, and frequency and must be approved by the Engineer's representative.

PAB 07.04 DRAWINGS

The drawings generally show the scope and extent of the proposed work and shall not be held as showing every minute detail of the work to be executed.

The position of power points, switches and light points that may be influenced by built-in furniture must be established on site, prior to these items being built in.

PAB 07.05 BALANCING OF LOAD

The Contractor is required to balance the load as equally as possible over the multiphase supply.

PAB 07.06 SERVICE CONDITIONS

All plant shall be designed for the climatic conditions appertaining to the service.

PAB 07.07 SWITCHES AND SOCKET OUTLETS

The installation of switches and socket outlets must conform to clause PAB.06.11 of this specification.

PAB 07.08 LIGHT FITTINGS AND LAMPS

The installation and mounting of luminaires must conform to clause PAB 06.18 of this specification.

All fittings to be supplied by the Contractor shall have the approval of the Engineer. Incandescent lamps shall bear the approved mark of the S.A.B.S. and shall have the British light centre length.

The light fittings must be of the type specified in the Schedule of Light Fittings.

PAB 07.09 EARTHING AND BONDING

The Contractor will be responsible for all earthing and bonding of the building and installation. The earthing and bonding is to be carried out strictly as described in clause PAB 09.16 of this specification and to the satisfaction of the Engineer's representative.

PAB 07.10 MAINTENANCE OF ELECTRICAL SUPPLY

All interruptions of the electrical supply that may be necessary for the execution of the work, will be subject to prior arrangement between the Contractor and the user Engineer and the Engineer's representative.

PAB 07.11 EXTENT OF WORK

The work covered by this contract comprises the complete electrical installation, in working order, as shown on the drawings and as per this specification, including the supply and installation of equipment and also the installation of such equipment supplied by the Engineer.

PAB 07.12 SUPPLY AND CONNECTION

The supply at the existing MCC is 400/230 Volt 50Hz.

The Contractor will be responsible for the supply and installation from MCC to new blowers and any other low-tension distribution board. The size and length of the cable is listed in the Schedule of Cables and measured in the Bills of Quantities.

PAB 07.13 CONDUIT AND WIRING

Conduit and conduit accessories shall be galvanised screwed conduit or galvanised plain end conduit in accordance with SABS 162, 763 and 1007 respectively.

All conduits, regardless of the system employed, shall be installed strictly as described in the applicable paragraphs of clauses 4 to 8 of Part 1 of the specification. Wiring of the installation shall be carried out as directed in clause 9 part 1 of this specification.

Where plain end conduit is offered all switches and light fittings must be supplied with a permanent earth terminal for the connection of the earth wire.

Lugs held by switch fixing screws or self tapping screws will not be acceptable.

PAB 07.14 POWER POINTS

Allow for the installation of power points and equipment as listed in the schedule, indicated on the drawings and described below:

PAB 07.15 CABLES

The Contractor shall supply and completely install all distribution cables as indicated on the drawings, and listed in the Schedule of Cables.

The storage, transportation, handling and laying of the cables shall be according to first class practice, and the contractor shall have adequate and suitable equipment and labour to ensure that no damage is done to cables during such operations.

The cable-trenches shall be excavated to a depth of 1m deep below ground level and shall be 450mm wide for one to three cables, and the width shall be increased where more than three cables are laid together so that the cables may be placed at least two cable diameters apart throughout the run. The bottom of the trench shall be level and clean and the bottom and sites free from rocks or stones liable to cause damage to the cable.

The Contractor must take all necessary precautions to prevent the trenching work being in any way a hazard to the personnel and public and to safeguard all structures, roads, sewage works or other property on the site from any risk of subsidence and damage.

In the trenches the cables shall be laid on a 75mm thick bed of earth and be covered with a 150-mm layer of earth before the trench is filled in.

All joints in underground cables and terminations shall be made either by means of compound filled boxes according to the best established practice by competent cable jointers using first class materials or by means of approved epoxy-resin pressure type jointing kits such as “Scotchcast”. Epoxy-resign joints must be made entirely in accordance with the manufacturer’s instructions and with materials stipulated in such instructions. Low tension PVCA cables are to be made off with sealing glands and materials designed for this purpose which must be of an approved make. Where cables are cut and not immediately made off, the ends are to be sealed without delay.

The laying of cables shall not be commenced until the trenches have been inspected and approved. The cable shall be removed from the drum in such a way that no twisting, tension or mechanical damage is caused and must be adequately supported at intervals during the whole operation. Particular care must be exercised where it is necessary to draw cables through pipes and ducts to avoid abrasion, elongation or distortion of any kind. The ends of such pipes and ducts shall be sealed to approval after drawing in of the cables.

Backfilling (after bedding) of the trenches is to be carried out with a proper grading of the material to ensure settling without voids, and the material is to be tamped down after the addition of every 150mm. The surface is to be made good as required.
On each completed section of the laid and jointed cable, the insulation resistance shall be tested to approval with an approved “Megger” type instrument of not less that 500 V for low tension cables.

Earth continuity conductors are to be run with all underground cables constituting part of a low tension distribution system. Such continuity conductors are to be stranded

bare copper of a cross-sectional area equal to at least half that of one live conductor of the cable, but shall not be less than 4mm² or more than 70mm². A single earth wire may be used as earth continuity conductor for two or more cables run together, branch earth wires being brazed on where required.

PAB 07.16 LAYING, JOINTING AND MAKING OFF OF ELECTRICAL CABLES

[The requirements specified hereafter, are aimed essentially at high tension cable but are also valid for low tension cable, where applicable.]

The use of the term “Inspector” includes the Engineer or inspector of the Engineer or an empowered person of the concerned supervising consulting engineer’s firm.

No cable is to be laid before the cable trench is approved and the soil qualification of the excavation is agreed upon by the Contractor and inspector.

After the cable has been laid and before the cable trench is back-filled the inspector must ensure that the cable is properly bedded and that there is no undesirable material included in the bedding layer.

No cable jointing will be permitted on this contract.

PAB 07.17 DISTRIBUTION BOARDS

The Contractor shall supply and install the distribution boards as indicated on the drawings and listed in the distribution Board Schedule. All distribution boards shall comply with this specification, and be approved by the Engineer’s representative.

The following types of distribution boards are required for the service:
Blower house and Module 2 & 3

- Surface Mounted Distribution

PAB 07.18 SCHEDULE OF DISTRIBUTION BOARDS

The front panels of normal supply, standby power and no-break supply sections shall be painted in distinctive colours as follows:

Normal supply	:	Light Orange, colour B26 of SANS 1091.
Standby power	:	Signal Red, colour A11 of SANS 1091.
No-break supply	:	Dark Violet, colour F06 or Olive Green, Colour H05 of SANS 1091.

Indicated is the probable fault level rating (kA) of the busbars. Refer to the Summary of Switchgear and Circuits for the minimum fault level rating of specified equipment.

BOARD	TYPE	PANEL	FAULT LEVEL	LOAD
MCC-1	Floor standing with doors	Normal power	45 kA	400 kW
MCC-2	Floor standing with doors	Normal power	45 kA	800 kW
MCC-3	Floor standing with doors	Normal power	45 kA	800 kW

PAB 07.19 SCHEDULE OF CABLES, CONDUIT AND WIRING

Supply, install and connect the following cable, conduit and wiring:

FROM	TO	SIZE AND TYPE	LOAD (kW)
MCC Existing to	MCC 2 & 3	6 x 240mm² 1-core PVC/SWA/PVC/ECC cable	800
MCC2 Normal/ Standby	Blower 1	2 x 185mm² 3-core PVC/SWA/PVC/ECC cable	400
MCC2 Normal/ Standby	Blower 2	2 x 185mm² 3-core PVC/SWA/PVC/ECC cable	400
MCC1 Normal/ Standby	Blower 3	2 x 185mm² 3-core PVC/SWA/PVC/ECC cable	400
MCC3 Normal/ Standby	Blower 4	2 x 185mm² 3-core PVC/SWA/PVC/ECC cable	400
MCC3 Normal/ Standby	Blower 5	2 x 185mm² 3-core PVC/SWA/PVC/ECC cable	400
MCC Normal/ Standby	LCP 1	1 x 4mm² 4-core PVC/SWA/PVC/ECC cable	3
MCC Normal/ Standby	LCP 2	1 x 4mm² 4-core PVC/SWA/PVC/ECC cable	3
MCC Normal/ Standby	LCP 3	1 x 4mm² 4-core PVC/SWA/PVC/ECC cable	3
MCC Normal/ Standby	LCP 4	1 x 4mm² 4-core PVC/SWA/PVC/ECC cable	3
MCC Normal/ Standby	LCP 5	1 x 4mm² 4-core PVC/SWA/PVC/ECC cable	3
MCC Normal/ Standby	RAS Pump 1	1 x 10mm² 4-core PVC/SWA/PVC/ECC cable	15
MCC Normal/ Standby	RAS Pump 2	1 x 10mm² 4-core PVC/SWA/PVC/ECC cable	15
MCC Normal/ Standby	RAS Pump 3	1 x 10mm² 4-core PVC/SWA/PVC/ECC cable	15
MCC Normal/ Standby	RAS Pump 4	1 x 10mm² 4-core PVC/SWA/PVC/ECC cable	15
MCC Normal/ Standby	WAS Pump 1	1 x 4mm² 4-core PVC/SWA/PVC/ECC cable	3
MCC Normal/ Standby	WAS Pump 2	1 x 4mm² 4-core PVC/SWA/PVC/ECC cable	3
MCC Normal/ Standby	WAS Pump 3	1 x 4mm² 4-core PVC/SWA/PVC/ECC cable	3
MCC Normal/ Standby	WAS Pump 4	1 x 4mm² 4-core PVC/SWA/PVC/ECC cable	3
MCC Normal Power	Flow Meters	1 x 1.5mm² 3-core PVCA cable	0.1

PAB 08 INSTALLATION DETAILS AND MEASUREMENT AND PAYMENT

PAB 08.01 INSTALLATION DESCRIPTION

Blower house upgrades of blower supply power and MCC panels

PAB 08.02 SCOPE OF WORK

The scope of this Contract includes the supply and installation of equipment and infrastructure for two new busbar routes connecting Feeder 1 to Incomer 1 and Feeder 2 to Incomer 2 with all ancillary plant work for ERWAT Waterval Wastewater Care Works, Modules 2 and 3, including:

- Manufacture, supply and Install new resin encapsulated aluminium busbars to accommodate electrical load of five Siemens Aeration Compressors (1050kW) between Feeder and Incomer MCC's;
- Install all mounting brackets, cable ladders for flexible leads and all necessary methods of earthing for busbar connection;
- Decommissioning, disconnection and removal of all existing supply cables in a staged manner to ensure maximum continued operation;
- Termination on new flexible leads to existing Feeder and Incomer MCC's;
- Modifications to the air inlet plenum Eastern wall to allow busbar access inside plenum and to Incomer MCC;
- Modification to the air inlet plenum door position to accommodate busbars running against the Blower house Northern wall;
- Testing and commissioning of the installation with COC certificate from qualified master electrician.
- Sealing of existing openings in walls with a non-shrink grout.
- Remove existing door and install new galvanized door in the plenum
- Minor building and structural work in order to install the door in the plenum
- Core drilling for the installation of the Busbars where required.

PAB 08.03 CABLE INSTALLATION

PAB 08.03.01 All low voltage 400V cables shall have stranded copper conductors, shall be of the 600/1 000V PVC/SWA/PVC/ECC type.

PAB 08.03.02 Where sleeves are not specified, cables shall be laid directly in the ground. Minimum laying depths shall be 1000 mm below final ground level unless otherwise specified. Contractor shall use hand excavation to minimise risk of damage to the existing services.

PAB 08.03.03 All trenching, including excavations, bedding layers, shoring and prevention of waterlogging, drainage of excavations, backfilling and compaction of trenches form part of this contract. The contractor shall be deemed to have allowed for the laying of

cables, terminal boxes, glands and termination of cables. Trenches shall be compacted to a minimum of 93% of modified AASHTO density during backfilling.

PAB 08.03.04 Tenderers shall take cognisance of the fact that other services might be installed along the same routes as the cables. The contractor shall, before commencing with any excavations, peg out the proposed cable route and confirm it with the Resident Engineer.

PAB 08.03.05 Tenderers are to note that the minimum earth cable size buried in soil shall be 25 mm².

PAB 08.03.06 Tenderers are to note that some cables will be installed underneath paved areas. The contractor shall be required to provide appropriate machinery for this type of installation and shall allow in his tender price for hiring of such machinery and the remedial civil work associated with this installation.

PAB 08.03.07 Cables running on surfaces of walls shall be routed inside galvanised steel piping or cable ladders.

PAB 08.04 DISTRIBUTION BOARDS

PAB 08.04.01 Existing Distribution Boards

(a) Tenderers shall note that, all distribution boards shall remain safe at all times. Adequate provision for the installation of temporary 3mm Perspex faceplates shall be allowed in the tender rates.

PAB 08.04.02 New Distribution Boards

(a) The distribution board requirements are as shown on the schematic drawings. Note the 6 kA minimum fault level.
(b) Electrical Contractors are advised to order the distribution board and equipment from a reputable manufacturer, as inferior boards will not be accepted.
(c) It shall further be noted that late approval of drawings and distribution boards due to non-compliance with the specification will not relieve the Electrical Contractor from his obligations to complete the installation according to programme. No claims for delays or extension of time in this regard, will be entertained.
(d) All phase, neutral and earth busbars shall be adequately sized to accept all present as well as future circuits and connections.
(e) Door hinges shall be of the Perano manufacture. The steel door shall be padlockable.
(f) The distribution board shall be powder coated
(g) The front face panel shall be secured by means of the Perano type catches. Catches with slots or square key formats will not be acceptable.

(h) Field panels shall be weatherproof and water tight

PAB 08.05 CONDUIT

PAB 08.05.01 Conduit work under open roof structures, along service passages and inside plant rooms shall be done on the surface in a rectangular grid pattern. Galvanized steel hospital saddles shall be used on all exposed conduit. Caddy clamps shall be used on roof purlins. Maximum spacing of saddles and clamps shall be 750 mm.

PAB 08.05.02 External draw box covers shall be sealed with white silicone after the installation has been completed.

PAB 08.05.03 Chasing on any concrete work will not be allowed.

PAB 08.06 OUTLETS

PAB 08.06.01 General

For the power installation, the Contractor shall be responsible for: -

(a) Supply and installation of isolators for equipment, motors including wiring, earthing and bonding.
(b) Final connection between isolator and equipment/motor.
(c) Supply and replacement of 16A switch socket outlets.
(d) Wiring of all circuits back to the DB with SABS approved wire as specified in the schedule of quantities.
(e) Labelling of all outlets as specified.
(f) Testing and commissioning of all circuits.

PAB 08.06.02 Isolators

(a) Isolators shall be similar or approved equal to GEWISS GW70432 or Lumex Clipsal type WHD.
(b) The isolators shall be the water resistant, surface mounted type installed in a non-corrosive enclosure
(c) The enclosure shall bear a permanently fixed (screwed) engraved Traffolite label indicating the DB and circuit number.

PAB 08.07 WIRING

PAB 08.07.01 Surfix or Norse cable shall not be accepted on this project.

PAB 08.07.02 All circuits shall be wired from fresh unused coils of red, white, blue and black conductors. The colours of conductors shall correspond to the phase from which that circuit is fed. The use of insulation tape to indicate phases will not be accepted.

PAB 08.07.03 Wiring shall not be drawn into conduit until the conduit installation has been completed, fitted with bushes and all moisture and debris have been removed.

PAB 08.07.04 Joints of any kind will not be permitted in wiring. No more than 2 single or 1 three phase circuit may be drawn into any 20mmø conduit.

PAB 08.08 EARTHING AND BONDING

PAB 08.08.01 The electrical contractor is to ensure that the installations covered in this document are effectively earthed and bonded in accordance with the requirements of the SANS 0313.

PAB 08.08.02 Particular attention shall be paid to motor bonding and earthing.

PAB 08.08.03 The earth conductor linking adjacent or back-to-back socket outlets shall not be cut. The conductor must be kept continuous and be doubled at the intermediate earth terminals.

PAB 08.09 LABELLING OF CIRCUITS

PAB 08.09.01 All conductors shall be marked by suitable cable markers indicating the circuit (e.g. P1 or G1 on both line and neutral conductors).

PAB 08.09.02 The label shall indicate the supply DB and circuit number (e.g. DB-M-P5).

PAB 08.10 INSPECTIONS

PAB 08.10.01 The Electrical Engineer's or Client's representative will inspect the installation at any time. All inferior, unsuitable, unacceptable or rejected work shall, if indicated by the inspecting officers or the Engineer, be removed and shall be rectified by the electrical contractor at his own expense. Under no circumstances will these inspections relieve the electrical contractor of his obligations in terms of the document nor will these inspections be regarded as final approval of the works or portions thereof.

PAB 08.10.02 Where inspections are requested by the Contractor, the Electrical Engineer's or Client's inspection shall only be carried out after the Contractor has carried out his own preliminary inspection to ensure that the Works are completed and comply with the documents. The Electrical Engineer's or Client's inspection shall therefore not be regarded as supervision, fault listing, quality assurance or site management.

PAB 08.10.03 Servicing of Distribution boards and cabling

(a) Service distribution boards: inspect and clean the distribution boards, treat the enclosure for moisture ingress and corrosion.

(b) Check for rigidity and fastening of equipment trays, panels, doors and handling devices.

(c) Check locking mechanism and fit padlock. All padlocks shall be of local manufacture with brass bodies and 75 mm chrome shackles. Three keys (with pvc labels) shall be provided for each lock.

(d) Replace damaged or missing faceplates, doors, mounting frames, handles, thumb catches, etc.

(e) Check operation of distribution board equipment and meters, replace if faulty or damaged with an approved type.

(f) Remove all obsolete equipment and meters.

(g) Check and fasten wiring and cable terminations.

(h) Re-arrange wiring and equipment to give a neat installation.

(i) Trace outgoing circuits.

(j) Fit labelling and blank face plate covers.

(k) Replace the distribution boards if required and replacement is approved by Engineer. Check earth bar and earth continuity, record.

(l) Label all wiring and cabling with Grafoplast Trasp PVC markers.

(m) Replace all circuit breakers that are rated below 5 kA.

PAB 08.10.04 <u>Lighting system</u>

(a) Indoor luminaires

(i) Operational and complete luminaires

- Remove lamps and wash luminaire body with detergent. Clean polycarbonate diffusors with detergent. Clean polished pure aluminium diffusors / reflectors with benzene.
- Check condition of luminaire seal, entrance gland, lampholder and internal wiring.
- Ensure that earth stud and earth connection is sound.
- Replace missing screws, catches, bolts and plugs.
- Check condition of suspension cords of pendant luminaires.
- Re-lamp.

(ii) Damaged or incomplete luminaires

- Remove luminaire.
- Replace luminaire and reconnect.
- Fit new lamps.

(b) Light switches

<u>Note</u>: All light switches shall have steel faceplates with permanent glued Traffolite labels.

- Remove switch cover.
- Check continuity of earth connection.
- Check operation of switch and replace if suspect.

- Replace switch cover, fit new csk stainless steel screws if required.

(c) Photocells

- Wash translucent body with detergent.
- Cover photocell and verify operation.
- Check bypass manual switching circuit.
- Enclose all exposed wiring in 16 mm ø Sprague.
- Install photocell in a dummy bulkhead

(d) Floodlight and bulkhead luminaires

- Remove lens and lamp. Wash lens thoroughly.
- Wash luminaire body with detergent.
- Clean polished pure aluminium reflectors with benzene.
- Check condition of internal wiring, capacitor, ballasts and starters.
- Check condition of neoprene seal and replace if worn or damaged.
- Check condition of lampholder.
- Seal conduit and wiring entry with silicone to eliminate water ingress.
- Fit new lamp.
- Check condition of earth stud and luminaire earth connection.
- Replace all missing screws, lens catches, bolts.
- Close cover securely, check stirrup bolts.

SCHEDULE OF LUMINAIRES

TYPE	DESCRIPTION
A	2 x 58W SABS OPEN CHANNEL FLUORESCENT LUNINAIRE - LASCON TYPE : R1-258 SS
B	2 x 58W SABS SURFACE MOUNTED INDUSTRIAL FLUORESCENT LUMINAIRE WITH STEEL REFLECTOR : LASCON TYPE R3-258 SS-SR
C	2 x 58W SABS IP 55 FLUORESCENT LUMINAIRE - LASCON TYPE : C2-258SS WITH WATERTIGHT DIFFUSER
D	70W HPS B40 BRITELITE WALL MOUNTED BULKHEAD LUMINAIRE : LASCON TYPE B40-70W HPS
E	BULKHEAD LUMINAIRE - LASCON TYPE: B10 WITH 2XPL9 LAMPS

PAB 08.10.05 Power outlets and fixed appliances

Note: All power outlets shall have steel faceplates with permanent glued Traffolite labels.

(a) Inspect all power outlets and verify earthing.
(b) Check contact points and tighten screws.
(c) Replace missing screws and covers for outlet and draw boxes.
(d) Replace missing, faulty or damaged socket outlets and plugs.
(e) Check conditions and operation of local isolators and control switches for fixed equipment and replace if faulty, damaged or missing.
(f) Check earthing of fixed appliances and test for earth continuity.
(g) Inspect cable and wireways.
(h) Check for rigidity and fastening of the cable ducts, ladders, ducting, powerskirting and surface conduiting, fasten or replace if loose or damaged, check earthing and test for earth continuity.

PAB 08.10.06 Earthing, bonding and lightning protection

(a) Check earthing and bonding of outlet points, equipment, cable and wireways, fixed appliances, water and gas pipes, etc.
(b) Check installation and termination of protective conductors and earth electrodes
(c) Test for earth continuity.
(d) Provide 6 mm² copper earth wire jumper between roof cladding and all gutter downpipes. Fasten with lugs and galvanized zinc bolts. Typically ten downpipes per housing unit. Earth at least two gutter downpipes by means of 16 mm² green insulated earth wire connected to 1,2 m earth electrode by means of cadwelding. Typically two downpipes per 25 m long housing unit.
(e) Installation of 50 mm² aluminium roof conductor in galvanised conduit from the roof cladding against the building to the earth electrode.

PAB 09 BUSBARS & TRUNKING SYSTEM SPECIFICATION

1. Busbars, metal-enclosed busbar trunking systems and connections shall comply with the relevant codes and specifications. The busbar trunking system, both feeder and plug-in, shall be of low impedance and sandwiched construction meaning no air gap shall exist between busbars expect at plug-in opening. All the insulation materials shall be halogen free.

2. The busbar trunking system shall be suitable for a 3 phases 4 wires system with full size neutral and continuous internal copper earth bar of 25% size.

3. The main busbars, distribution busbars, risers and droppers shall be of hard drawn high conductivity copper, having a constant rectangular cross section throughout. They shall be rated as specified in the Table below, but the rating shall not be less

than specified for the main incoming circuit breaker or isolator.

Item	Description	Requirements
1	Busbar Conductor Material	Aluminium
2	Rated Current	3200A
3	Rated Voltage	1000V
4	Number of Conductors	3L + N + PE
	Earth Conductor	25% Size
	Casing Size	290x150mm ±5% max
	Rated short-time withstand r.m.s current 1 sec (kA)	50kA
	Frequency	50Hz

4. The busbars shall be designed to withstand for 3 seconds the mechanical and thermal stresses associated with the prospective short-circuit current specified in the table above.

5. All busbar trunking system including all fittings (elbows, zeds, end-feed units, tap-off units, etc.) shall be IP55 and above in accordance to IEC 60529 and sprinkler proof without any extra accessory.

6. The main busbars shall be mounted horizontally with the longer dimension in the vertical plane. All joints shall be tightened to the correct torque before the power is switched ON and must be checked just prior to commissioning.

7. Busbars shall be mounted on substantial moulded epoxy or resin insulators fixed with robust steel brackets/hangers. Horizontal runs of busbar trunking system shall be supported by brackets/hangers at every 3 meters minimum.

8. The minimum clearances between current carrying parts and between current carrying parts and other metal parts shall be in accordance with the relevant codes and specifications.

9. The switchgear manufacturer shall provide necessary copper flexible or bar connections between the riser terminals and the cable terminals. The switchgear riser terminals shall be properlytinned.

10. Connections to the busbars shall be effected by means of the correct clamps or lugs with soldered connections or with connections crimped with the correct equipment.

11. The neutral busbar cross-section shall be equal to that of the phase busbars, and may not be reduced without the approval of the Engineer.

12. Unless fully tested in accordance with SANS IEC 60439-1, the current density of copper busbars shall not exceed 2 A/mm² for currents up to 1600 A, or 1,6 A/mm² for currents above 1600 A.

13. All terminations onto busbars and busbar interconnections shall be bolted with cadmium-plated high tensile bolts, washers, spring washers and nuts. In corrosive areas, substitute lock nuts for spring washers. The largest possible size bolt that will fit into holes in lugs and fixing holes of equipment shall be used in every instance. Bolts shall be of sufficient length that at least two but not more that five threads protrude beyond the nut. Connections shall be kept as short and straight as possible and where dissimilar metals are connected means shall be provided to prevent electrochemical reactions and corrosion.

14. The maximum current density in busbars and connections shall be such that in no part of the switchgear equipment including circuit breakers, isolating equipment, busbars, current transformers, cable boxes, and connections shall exceed a temperature of 60°C
i.e. a temperature rise of 20°C at an ambient temperature of 40°C.

15. Earth bars shall have sufficient ways for all the earth conductors and, in addition, 30% spare space shall be provided.

16. Bustrunking

The busbar trunking shall be vermin-proof and noiseless under load and completely maintenance-free.

Busbar trunking shall have rated short-time withstand current for one second equal to the indicated maximum prospective fault current.

The Contractor shall submit type tests for current rating, rated short-time withstand current, and impedance characteristics to the Engineer.

Pressure test low voltage busbar trunking after installation and before commissioning at 2 kV for one minute between phases, between phases and neutral and between phases and earth.

Confirm route access and dimensions on site and compile shop drawings. Submit shop drawings to the Engineer for approval before proceeding with manufactore.

Epoxy or polyester moulded, enclosed bustrunking shall be subject to the Engineers approval. Test certificates according to the relevant cables and specification shall be submitted as required.

The Contractor shall allow in the pricing for a complete system including all inter-connectors, flexible links, terminations and suitable brackets to fix the busbars to structures.

The busbar trunking system shall be suitable for continuous operation without derating at an average ambient temperature of 35o C for 24h (40°C maximum peak).

17. Expansion Joint

Busbar expansion units shall be use in cases when it crosses a building expansion joint or as recommended by the vendor to reduce the stress on the system by differential expansion between the busbars and the casing; particularly for long run of the busbar.

It shall be consist of a flexible joint in the middle on the conductors and a sliding casing in 2 sections which can absorb the relative movements of each section of the length.

PAB 10. MEASUREMENT AND PAYMENT

PAB 10.01 Service distribution board No

The unit of measurement shall be the number of distribution kiosks or boards opened and serviced as specified in Clause AB 10.02.

The tendered rate shall include full compensation for the opening of the distribution board or kiosk, internal cleaning of the enclosure, cleaning of equipment and meters, removal of obsolete distribution board equipment, re-arrangement of equipment and wiring, treatment of the enclosure for moisture ingress and corrosion, vermin protection, fastening and / or replacement of wiring, tracing of outgoing circuits, labelling of outgoing wiring and mcb's and cable terminations and earth testing.

The tendered sum shall further include for replacement of damaged, missing or faulty distribution board switchgear, meters, face plates, mounting frames, handling devices, doors, labelling with engraved Traffolite labels, neutral bars, earth bars etc. All downstream circuit breakers shall be rated at 6 kA fault level.

PAB 10.02 Supply and install distribution board No

The unit of measurement shall be the number of distribution boards supplied and installed.

The tendered rate shall include full compensation for the supply and installation of an epoxy painted new enclosure, mounting frames, plates, equipment, meters, labelling etc.

The tendered sum shall further include for wiring of the board, cable termination, cable labelling, remedial builders work and earth testing.

PAB 10.03 **Supply and install or removal of cabling** m

The unit of measurement shall be the linear length of cable supplied and installed or removed from the installation.

The tendered rate shall include full compensation for the supply, handling, installation and termination of the specified type of cable. This rate shall also include for the supply of all cable ties, clamps and other material necessary to ensure that the installation conforms to the specification.

The tendered rate shall further include full compensation for the removal of the cables from the cable racks and installation and neatly coiling of the cables. Cables to be delivered to the stores on site.

PAB 10.04 **Supply and install wiring** m

The unit of measurement shall be the linear length of conductors supplied and installed.

The tendered rate shall include full compensation for the supply, handling, installation, pulling in conduit and termination of the specified type of conductor.

This rate shall further include for the supply of all cable ties, labelling, and other material necessary to ensure that the wiring conforms to the specification.

PAB 10.05 **Jointing and termination of cables** No

The unit of measurement shall be number of cable joints or terminations.

The tendered rate shall include full compensation for the cost for providing the kits, complete with compound, ferrules and cable lugs, the cost for cutting the cable, handling and fitting kits and the cost of testing the joints and terminations. Position of joints shall be indicated on as-built drawing

PAB 10.06 **Supply and install padlocks** No

The unit of measurement shall be number of padlocks supplied and installed.
The tendered rate shall include full compensation for the ordering, supply and installation of the 75 m locally manufactured padlocks and locking devices as well as fitting each of the three keys with purpose-made pvc labels.

PAB 10.07 **Excavate in all materials for trenches, backfill, compact and dispose of surplus material** m^3

The unit of measurement shall be the cubic meter of material excavated in trenches.

The tendered rate shall include full compensation for clearing and grubbing the trench areas, for excavating the trench, preparing the bottom of the trench, separating material unsuitable for backfill and dealing with any surface or subsurface water.

The tendered rate shall furthermore cover the cost of installing the sand bed and sand cover, backfilling, compacting and disposing of the surplus material.

PAB 10.08 **Supply and install cable sleeves** m

The unit of measurement shall be the linear length in meter of the cable sleeve supplied and installed.

The tendered rate shall include full compensation for the supply, delivery, handling and installing the specified sleeves including the all the required, couplings, steel draw wires and plugs.

PAB 10.09 **Supply and install plastic warning tape** m

The unit of measurement shall be the linear length in meter of the plastic warning tape supplied and installed.

The tendered rate shall include full compensation for the supply, handling and laying of the plastic warning tape.

PAB 10.10 **Termination/Disconnection of the low voltage cable** No

The unit of measurement shall be the number of low voltage cable terminated or disconnected.

The tendered rate shall include full compensation for providing the cable glands and shrouds, the cost for handling, fitting and cutting the cable.
The tendered rate shall further include full compensation for disconnecting the cable glands and shrouds, the cost for removal of the cables from the installation.

PAB 10.11 **Supply and install earth continuity conductor** m

The unit of measurement shall be the linear length in meter of the earth continuity conductor supplied and installed.

The tendered rate shall include full compensation for procuring, furnishing and laying the specified earth continuity conductor.

PAB 10.12 **Termination and connect earth continuity conductor** No

The unit of measurement shall be the number of earth continuity conductors terminated and connected.

The tendered rate shall include full compensation for supplying all the material required to terminate and connect the earth continuity conductors and the connecting thereof to the earth bars, including label tags.

PAB 10.13 **Supply and installation of circuit breakers** No

The unit of measurement shall be the number of circuit breakers supplied and installed.

The tendered rate shall include full compensation for the supply and installation of the specified type and size of circuit breaker, including printed PVC labelling.

PAB 10.14 **Supply and installation of isolators** No

The unit of measurement shall be the number of isolators supplied and installed.

The tendered rate shall include full compensation for the supply and installation of the specified isolator, including printed PVC labelling.

PAB 10.15 **Supply and install contactors** No

The unit of measurement shall be the number of contactors supplied and installed.

The tendered rate shall include full compensation for the supply and installation of the specified type of contactor, including engraved labelling on rear tray.

PAB 10.16 **Supply and install switching timers** No

The unit of measurement shall be the number of switching timers supplied and installed.

The tendered rate shall include full compensation for the supply and installation of the specified type of switching timer, including labelling.

PAB 10.17 **Supply and install earth leakage units** No

The unit of measurement shall be the number of earth leakage units supplied and installed.

The tendered rate shall include full compensation for the supply and installation of the specified type of earth leakage units, including labelling.

PAB 10.18 **Supply and install fuses** No

The unit of measurement shall be the number of fuses supplied and installed.

The tendered rate shall include full compensation for the supply and installation of the specified type of fuse, including engraved label indicating fuse rating.

PAB 10.19 **Supply and install surge arrestors** No

The unit of measurement shall be the number of surge arrestors supplied and installed.

The tendered rate shall include full compensation for the supply and installation of the specified type of surge arrestors, with visual indication.

PAB 10.20 Supply wire marker kit No

The unit of measurement shall be the number of specified wire marker kits supplied.

The tendered rate shall include full compensation for the procurement and delivery of the cable marker kit as specified.

PAB 10.21 LIGHTING SYSTEM

PAB 10.21.01 Re-lamp luminaire No

The unit of measurement shall be the number of lamps replaced.

The tendered rate shall include full compensation for the supply and installation of the specified lamp according to the manufacturer's instructions. Replacement date must be written on lamp.

PAB 10.21.02 Service luminaire No

The unit of measurement shall be the number of luminaires opened and serviced In accordance with Clause AB 10.02.

The tendered rate shall include full compensation for the servicing of the luminaire, including washing, checking of seals, glands, lamp holders, cleaning of diffusers, tightening of fixing screws and bolts, corrosion protection and the checking of earthing continuity and aiming angle if applicable. All external luminaire conduit entries are to be sealed with silicone, which cost is included in this payment item.

The tendered rate shall further include for replacement of the luminaires internal wiring where applicable and the tightening of all connections

PAB 10.21.03 Supply and install luminaire No

The unit of measurement shall be the number of luminaries supplied and installed .

The tendered rate shall include full compensation for the supply and installation of the specified type of light fitting complete with lamp and control gear, according to manufacturer's instructions.

PAB 10.21.04 Supply and install light switch No

The unit of measurement shall be the number of light switches supplied and installed.

The tendered rate shall include full compensation for the removal of the existing light switch and for the supply and installation of the specified type of light switch to manufacturer's instructions. Light switch face plate shall be fitted with an engraved Traffolite label as per Nosa-standard, cost of, which is included in rate.

PAB 10.21.05 Supply and install photo-electric switch No

The unit of measurement shall be number of photocell units replaced.

The tendered rate shall include full compensation for the supply, connecting and testing of the switch.
The rate shall further include full compensation for the cost of providing and installing all hardware, screws, wall plugs, 16 mm ø sprague and other material required to install the photo electric light switch in accordance with the manufacturer's specification.

The tendered rate shall further compensate for the supply and installation of the photocell inside a dummy B10 bulkhead.

PAB 10.21.06 Replace luminaire diffuser No

The unit of measurement shall be number of luminaire diffusers replaced.

The tendered rate shall include full compensation for the supply and installation of the specified type of diffuser, including fixing screws and clips.

PAB 10.21.07 Service light switch No

The unit of measurement shall be the number of light switches opened and serviced.

The tendered rate shall include full compensation for the servicing of the light switch, internal cleaning of the enclosure, spray painting, inspection of the contact points, switching mechanism, earthing, etc.

The tendered sum shall further include for replacement of any missing outlet covers and fixing screw and earth testing. Light switch face plate shall be fitted with an engraved Traffolite label as per Nosa-standard, cost of, which is included in rate.

PAB 10.21.08 Remove, clean, store and reinstallation of luminaire No

The unit of measurement shall be the number of light fittings removed, cleaned, stored and reinstalled.

The tendered rate shall include full compensation for the removal, disconnect, cleaning, storage (4 weeks) reinstallation, reconnection and testing of the luminaire.

The rate shall further include full compensation for the installation of 2 x 700 mm supporting timber members above the ceiling (114 x 38 Par SA Pine) and the mounting of 63 mm ø round conduit outlet box complete with 2 x 4 x 60 mm galvanised screws.

PAB 10.21.09 Replace Lamp Holder No

The unit of measurement shall be the number of lamp holders replaced.

The tendered rate shall include full compensation for the removal of the existing lamp holder and for the supply and installation of the specified type (ceramic) of lamp holder to the manufacturer's instructions.

PAB 10.21.10 Replace Luminaire internal components No

The unit of measurement shall be the number of SANS approved internal luminaire components replaced.

The tendered rate shall include full compensation for the removal of the defective component and for the supply, installation and testing of the specified type of component to the manufacturer's instructions.

PAB 10.22 SMALL POWER AND FIXED APPLIANCES

PAB 10.22.01 Supply and install socket outlet No

The unit of measurement shall be the number of socket outlets supplied and installed.

The tendered rate shall include full compensation for the removal of the existing socket outlet and the supply and installation of the specified type of socket outlet.

All socket outlets shall be supplied complete with cover plates and boxes where required. The tendered rate shall therefore include for the supply of the cover plates and fixing screws where applicable. Outlet face plate shall be fitted with an engraved, Traffolite label as per Nosa-standard, cost of, which is included in the rate.

PAB 10.22.02 Supply and install isolator No

The unit of measurement shall be the number of isolators supplied and installed.

The tendered rate shall include full compensation for the supply and installation of the specified type of isolator or control unit.

The tendered sum shall further include for the provision of 4 wire, 3 phase connections to the fixed appliance. Isolator face plate shall be fitted with an engraved Traffolite label as per Nosa-standard, cost of, which is included in the rate.

PAB 10.22.03 Replace plug tops No

The unit of measurement shall be the number of plug tops replaced.

The tendered rate shall include full compensation for the supply and installation of the required type of plug top.

PAB 10.22.04 Supply and install conduit m

The unit of measurement shall be the linear meter of conduit supplied and installed.

The tendered rate shall include full compensation for the supply and installation of the specified type and size of conduit, including all fixing accessories.

PAB 10.22.05 Supply and install wiring channel m

The unit of measurement shall be number of linear meter of wiring channel replaced.

The tendered rate shall include full compensation for the supply and installation of the specified type of wiring channel with 6 x 60 mm fasteners, including the cover and all the necessary accessories.

PAB 10.22.06 Supply and install connections to fixed appliances No

The unit of measurement shall be number of connections made.

The tendered rate shall include full compensation for the supply and installing of the connections to the fixed appliances.

PAB 10.22.07 Service socket outlet No

The unit of measurement shall be the number of socket outlets opened and serviced.

The tendered rate shall include full compensation for the servicing of the socket outlet , internal cleaning of the enclosure, inspection of the contact points, switching mechanism, if applicable, earthing, etc. Outlet face plate shall be fitted with an engraved, Traffolite label as per Nosa-standard, cost of, which is included in the rate.

The tendered sum shall further include for replacement of any missing outlet covers and fixing screw and earth testing.

PAB 10.22.08 Service isolator No

The unit of measurement shall be the number of isolators opened and serviced.

The tendered rate shall include full compensation for the servicing of the isolator , internal cleaning of the enclosure, inspection of the contact points, switching mechanism, earthing and connections to the fixed appliance. Isolator face plate shall be fitted with an engraved Traffolite label as per Nosa-standard, cost of, which is included in the rate.

The tendered sum shall further include for replacement of any damaged or missing outlet covers and fixing screw, connections to appliances including earth continuity testing.

PAB 10.22.09 Replace power skirting m

The unit of measurement shall be the linear metre of power skirting supplied and installed.

The tendered rate shall include full compensation for the removal of the existing power skirting, the supply and installation of the specified type and size of powerskirting including all accessories.

PAB 10.22.10 Supply and install Pratley boxes No

The unit of measurement shall be the number of Pratley boxes supplied and installed.

The tendered rate shall include full compensation for the supply and installation of the specified type of Pratley box.

PAB 10.22.11 Supply and install draw boxes No

The unit of measurement shall be the number of draw boxes supplied and installed.

The tendered rate shall include full compensation for supplying and installing the draw boxes including cover plates where no equipment is installed in the box.

PAB 10.22.12 Supply and install draw box cover plates No

The unit of measurement shall be the number of draw box cover plates supplied and installed.

The tendered rate shall include full compensation for the supply and installation of the specified type and size of cover plates for draw boxes including the fixing screws.

PAB 10.22.13 Replace “stop-start” local control panel No

The unit of measurement shall be the number of “stop-start” local control panels supplied and replaced.

The tendered rate shall include full compensation for the supply and installation of “stop/start” local control panel including emergency stop button and 32A 3 pole contactor in an IP55 polycarbonate enclosure. The rate shall include an engraved Traffolite label indicating load and supply DB.

PAB 10.23 Provide Certificate of Compliance sum

The unit of measurement shall be a sum for all Certificate of Compliance obtained from local authorities and issued to the Engineer for all the buildings under the installation.

The tendered rate shall include full compensation for the testing and all associated equipment to complete the Certificate of Compliance and certification thereof.

PAB 10.24. EARTHING AND BONDING

PAB 10.24.01 Supply and install earthing and bonding for the installation

Lump sum

The tendered lump sum shall include full compensation for the provision of all material required for the earthing and bonding of the installation in accordance with the specification.

PAB 10.24.02 Testing of the earth installation by a specialist contractor

Lump sum

The tendered lump sum shall include full compensation for the testing of the earth installation by a specialist contractor approved by the Engineer.

PAB 10.24.03 Earth building roof structure No

The unit of measurement shall be the number of roof structures earthed.

The tendered sum shall include full compensation for the supply and installation of the specified type and size of earthwire and the termination there off onto a 1.2 m Cu earth electrode driven into the soil 1,8 m deep.

PAB 10.25 INSPECTION OF ELECTRICAL INSTALLATION

PAB 10.25.01 Inspection of building general electrical installation sum

The unit of measurement shall be the sum for the building inspected prior to commencement of the repair work phase.

The tendered sum shall include the visual and functional inspection and testing of all lights, switches, small power points and fixed appliances, to determine the extent of repairs or replacements required.

The rate shall further include the preparation of a schedule of items requiring repairs or replacement, for approval by the engineer.

PROJECT NO: ERW202012/TNDR-001

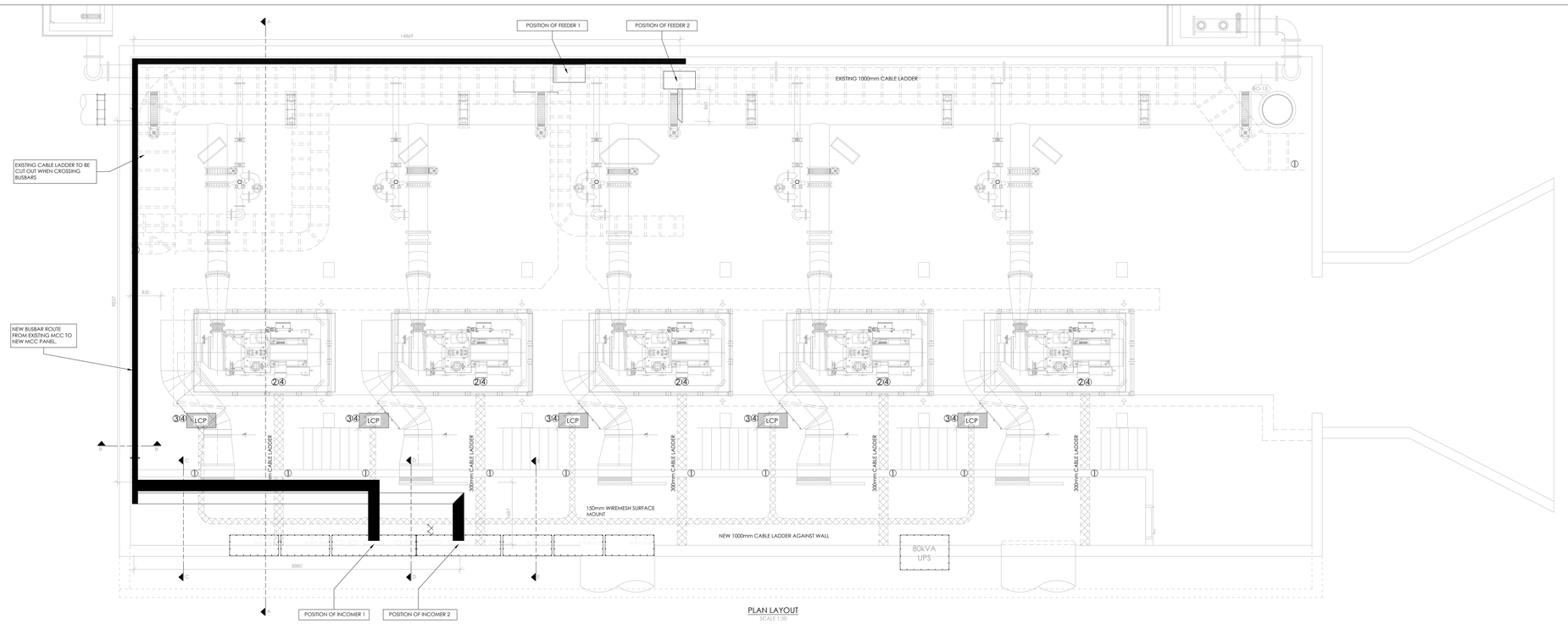
WATERVAL WASTEWATER CARE WORKS: SUPPLY AND INSTALLATION OF 3200A RESIN ENCAPSULATED BUSBAR SYSTEM FOR AERATION BLOWERS PROJECT

ERWAT
EXCELLENCE IN WATER CARE

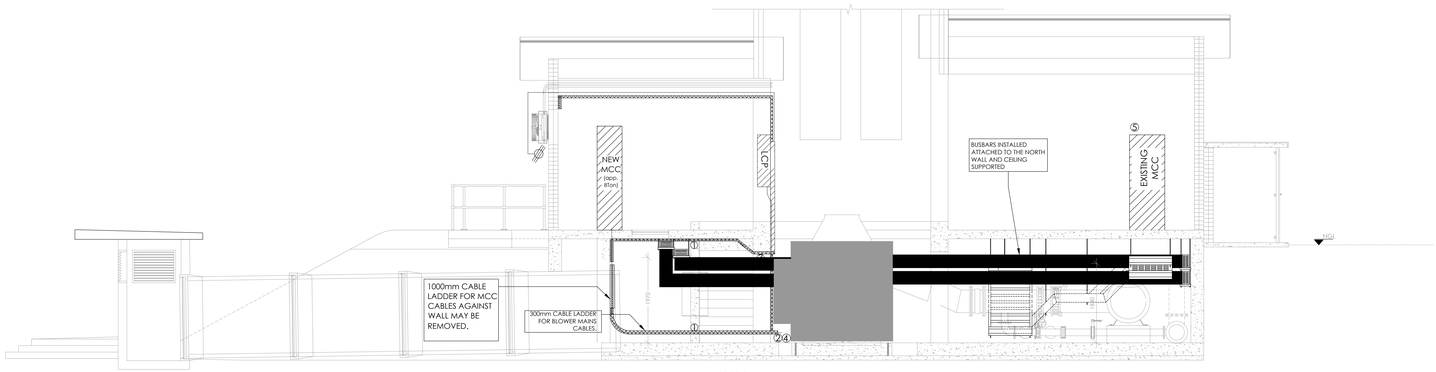
C6 DRAWINGS

DRAWINGS ISSUED FOR CONTRACT ERW202012/TNDR-001 SUPPLY AND INSTALLATION OF 3200A RESIN ENCAPSULATED BUSBAR SYSTEM FOR AERATION BLOWERS PROJECT

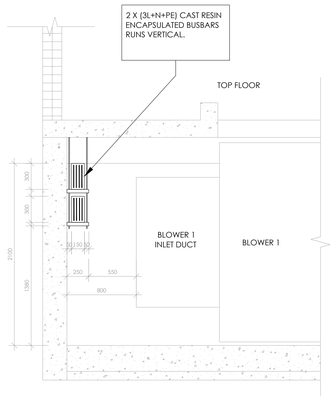
DRAWING NUMBER	DRAWING TITLE
ERW202012/TNDR-001	BLOWER HOUSE BUSBARS: LAYOUT AND SECTIONAL DETAIL OF NEW ELECTRICAL BUSBAR ROUTES FROM EXISTING MCC TO NEW MCC



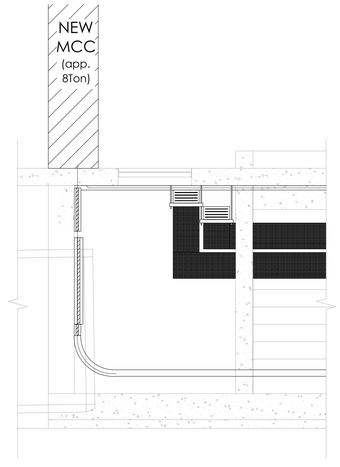
PLAN LAYOUT
SCALE 1:50



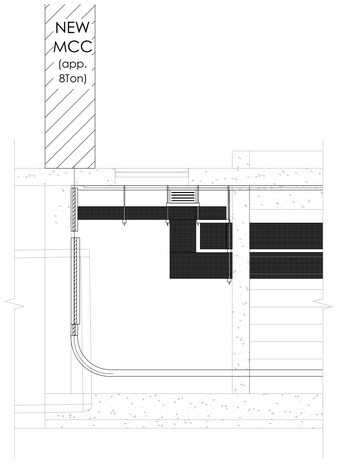
SECTION A - A
SCALE 1:20
(REFER TO DRAWING 0229/02/04)



SECTION B - B
SCALE 1:25



SECTION C -C
SCALE 1:25



SECTION D - D
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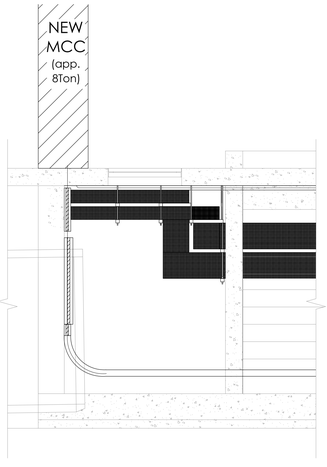

SECTION E - E
SCALE 1:25

FOR CONSTRUCTION

NOTES

NO.	DATE	REVISIONS	INITIALS
0	DEC'20	ISSUED FOR TENDER	JM

CAD FILE NAME: ERW202012/TNDR-001_BLOWER HOUSE BUSBAR ROUTES
PAGE TYPE: A0

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PROJECT TITLE

WATERVAL WASTEWATER CARE WORKS: SUPPLY AND INSTALLATION OF 3200A RESIN ENCAPSULATED BUSBARS FOR AERATION BLOWERS PROJECT

PROJECT NUMBER
ERW202012/TNDR-001

DRAWING TITLE

BLOWER HOUSE BUSBARS: LAYOUT AND SECTIONAL DETAIL OF NEW ELECTRICAL BUSBAR ROUTES FROM EXISTING MCC TO NEW MCC

DRAWN: R RYKAART	DESIGNED:
SCALE: N.T.S	CHECKED: J MALAN
DATE: DEC'20	APPROVED: M RATSHITANGA

DRAWING NUMBER: ERW202012/TNDR-001
REVISION: T1