

VOLUME 3 OF 3

THE CONTRACT

NEC 3 Engineering and Construction Contract Option A: Priced Contract with Activity Schedule of April 2013 (including amendments).

TENDER NO. RFP260/2021

APPOINTMENT OF AN EPC CONTRACTOR TO CARRY OUT ENGINEERING, PROCUREMENT AND CONSTRUCTION OF A 50 TON PER DAY BIODIGESTER PILOT PLANT AT ROBINSON DEEP LANDFILL SITE, JOHANNESBURG AND OPERATING AND MAINTAINING IT FOR A PERIOD OF 3 YEARS



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Notes:

The Tender Document must be submitted as a whole. All forms must be properly completed as required and the document shall not be taken apart or altered in any way whatsoever.

All forms must be duly completed in **black ink** as required.

The list of returnable documents, which consists of forms and schedules to be completed and company specific certificates and information pages to be attached, comprise the following:

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THE CONTRACT

- C1 : AGREEMENT AND CONTRACT DATA**
- C2 : PRICING DATA**
- C3 : SCOPE OF WORK**
- C4 : SITE INFORMATION**

PART 1: AGREEMENT AND CONTRACT DATA

NOTE: Tenderers to note that this project will be carried out with two different contracts as follows:

1. **Contract 1 – Engineering Procurement Construction and Commissioning Contract of the Biomethane Demonstration Plant.**
 - a. **NEC 3 Engineering and Construction Contract Option A:** Priced Contract with *Activity Schedule* of April 2013 (including amendments).
2. **Contract 2 – Operations and Maintenance Contract for 3 Years for the Biomethane Demonstration Plant**
 - a. **NEC3 -Term Service Contract** of April 2013 (including amendments).

Document reference	Title	No of pages
C1.1	Form of Offer and Acceptance	4
C1.2	Contract Data	1
	Part One – Data provided by the <i>Employer</i>	24
	Part Two – Data provided by the <i>Contractor</i>	2
C1.3	Performance Guarantee	4
	Total number of pages	33

C1.1 FORM OF OFFER AND ACCEPTANCE

C1.1.1 Offer

The Employer, identified in the acceptance signature block, has solicited offers to enter into a contract for the procurement of: **TENDER No: RFP260/2021: APPOINTMENT OF AN EPC CONTRACTOR TO CARRY OUT ENGINEERING, PROCUREMENT AND CONSTRUCTION OF A 50 TON PER DAY BIODIGESTER PILOT PLANT AT ROBINSON DEEP LANDFILL SITE, JOHANNESBURG AND OPERATING AND MAINTAINING IT FOR A PERIOD OF 3 YEARS.**

The tenderer, identified in the offer signature block, has examined the documents listed in the tender data and addenda thereto as listed in the returnable schedules, and by submitting this offer has accepted the conditions of tender.

By the representative of the tenderer, deemed to be duly authorized, signing this part of this form of offer and acceptance, the tenderer offers to perform all of the obligations and liabilities of the service provider 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 of the Prices exclusive of VAT is	R
Value Added Tax @ 15% is	R
The offered total of the amount due inclusive of VAT is ¹	R
(in words)	

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 or issue a conditional Letter of Acceptance subject to certain conditions which must be fulfilled prior to final acceptance and signing of the acceptance part of this form, whereupon the tenderer becomes or may become 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 of Tenderer

Address of Tenderer

Name of witness

Signature of witness Date

C1.1 FORM OF OFFER AND ACCEPTANCE (Continued)

C1.1.2 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 service provider 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:

- Part C1: Agreements and Contract Data, (which includes this Form of Offer and Acceptance)
- Part C2: Pricing data
- Part C3: Scope of work.
- Part C4: Site information

and the schedules, forms, drawing 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 authorized representatives of both parties.

The tenderer shall within two weeks after receiving a completed copy of this agreement, including the schedule of deviations (if any), or the date specified in the conditional Letter of Acceptance, whichever date is the earliest, contact the Employer's representative (whose details are given in the contract data or Letter of Acceptance) to arrange the delivery of any securities, bonds, guarantees, proof of insurance and any other documentation to be provided in terms of the conditions of contract identified in the contract data or Letter of Acceptance. Failure to fulfil any of these obligations in accordance with those terms shall constitute a repudiation of this agreement and the Employer may in its sole discretion accept such repudiation and either appoint one of the other tenderers or cancel the tender and re-issue it.

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 or the conditional Letter of Acceptance notified 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**

Development Bank of Southern Africa Limited
1258 Lever Road, Headway Hill, Midrand, Gauteng Province

Name of witness

Signature of witness Date

Schedule of Deviations

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 Tender Data and the Conditions of Tender.

A Tenderer's covering letter will not necessarily 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.

(Any cover letter must be referenced here if applicable, or it will not be valid as part of this submission).

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.

Any change or addition to the Tender documents arising from the above agreements and recorded here shall also be incorporated into the final Contract.

1 Subject	.....
Details	.....

2 Subject	.....
Details	.....

3 Subject	.....
Details	.....

4 Subject	.....
Details	.....

5 Subject	.....
Details	.....

By the duly authorized 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 the 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:

Signature(s)

Name(s)

Capacity

Name of Tenderer

Address of Tenderer

Name of witness

Signature of witness Date

For the Employer:

Signature(s)

Name(s)

Capacity

Name of Employer: **Development Bank of Southern Africa Limited**

Address of Employer 1258 Lever Road, Headway Hill, Midrand, Gauteng Province

Name of witness

Signature of witness Date

C1.2 CONTRACT DATA

Document reference	Title	No of pages
C1.2	Contract Data	
	Part One – Data provided by the <i>Employer</i>	24
	Part Two – Data provided by the <i>Contractor</i>	2
C1.3	Performance Guarantee	4
	Total number of pages	28

Part One - Data provided by the *Employer*

[Instructions to the contract compiler: (delete these two notes in the final draft of a contract)]

1. Please read the relevant clauses in the conditions of contract before you enter data. The number of the clause which requires the data is shown in the left hand column for each statement however other clauses may also use the same data.
2. Whenever a cell is shaded in the left hand column it denotes this data is optional and would be required in relation to the option selected. In the event that the option is not required select and delete the whole row. Where the following symbol is used "[●]" - data is required to be inserted relevant to the specific option selected.

Completion of the data in full, according to the Options chosen, is essential to create a complete contract.

Clause	Statement	Data
1	General	
	The <i>conditions of contract</i> are the core clauses and the clauses for main Option	
		A: Priced contract with activity schedule
	dispute resolution Option	
		W1: Dispute resolution procedure
	and secondary Options	
		X1: Price adjustment for inflation
		X2: Changes in the law
		X7: Delay damages
		X13: Performance Bond

		X16: Retention
		X17: Low Performance Damages
		X18: Limitation of liability
		Z: Additional conditions of contract
	of the NEC3 Engineering and Construction Contract, April 2013 (ECC3)	
10.1	The Employer is:	the Development Bank of Southern Africa Limited, acting through its Infrastructure Delivery Division (the "IDD"), a juristic person reconstituted and incorporated in terms of section 2 of the Development Bank of Southern Africa Act No 13 of 1997 (the "DBSA");
	Address:	Registered office at 1258 Lever Road Headway Hill, Midrand Johannesburg
	Represented by:	To be indicated at contracting
	Tel No.	To be indicated at contracting
	Fax No.	To be indicated at contracting
10.1	The Project Manager is:	Nonhle Dlamini / Attie Ferreira
	Address:	Registered office at 1258 Lever Road Headway Hill, Midrand Johannesburg
	Tel No.	To be indicated at contracting
	e-mail:	To be indicated at contracting
10.1	The Supervisor is:	To be indicated at contracting
	Address:	Registered office at 1258 Lever Road Headway Hill, Midrand Johannesburg

	Tel No.	To be indicated at contracting
	Fax No.	To be indicated at contracting
	e-mail:	To be indicated at contracting
11.2(13)	The <i>works</i> is	Engineering, procurement and construction of a 50 ton per day biodigester pilot plant at Robinson Deep Landfill Site, Johannesburg and operating and maintaining it for a period of 3 years
11.2(14)	The following matters will be included in the Risk Register	- Compliance with tender requirements - Personnel Clearance and Authorised Access to Site
11.2(15)	The <i>boundaries of the site</i> are	Robinson Deep Landfill Site, Johannesburg
11.2(16)	The Site Information is in	Part 4: Site Information
11.2(19)	The Works Information is in	Part 3: Scope of Work.
12.2	The <i>law of the contract</i> is the law of	The Republic of South Africa
13.1	The <i>language of this contract</i> is	English
13.3	The <i>period for reply</i> is	5 Days
2	The Contractor's main responsibilities	Turn-key as per the scope of work
3	Time	
11.2(3)	The <i>completion date</i> for the whole of the <i>works</i> is	<p>Contract 1: (EPC) The design, construction, implementation and commissioning, testing and handover of the biomethane plant should be completed in 18 months from starting date.</p> <p>Contract 2: Operations and Maintenance of the biomethane infrastructure to be completed in 36 months from starting date.</p> <p>Tenderers to note that contract applicable to operations and maintenance of the biomethane plant will be NEC 3 Term Service Contract that will come into effect upon practical completion of the biomethane plant. The 12 months defects liability period for the plant as a whole and its</p>

		subcomponents commissioned under the EPC Contract, will run concurrently with the commencement of the O&M Contract.	
30.1	The <i>access dates</i> are	Part of the site	Date
		[•]TBC	
		[•]	
30.3	The <i>key dates and conditions</i> to be met are	<i>condition</i> to be met	<i>key date</i>
		[•]Site establishment	[•]TBC
		[•]Completion	[•]TBC
31.1	The <i>Contractor</i> is to submit a first programme for acceptance within	1 week of the Contract Date.	
31.2	The <i>starting date</i> is	[•] Site Handover Date	
32.2	The <i>Contractor</i> submits revised programmes at intervals no longer than	4 weeks	
35.1	The <i>Employer</i> is not willing to take over the <i>works</i> before the Completion Date.	Confirmed	
4	Testing and Defects		
42.2	The <i>defects date</i> is	Contract 1: 12 months after [Completion of the whole of the <i>works</i> /Sectional Completion per section of the <i>works</i>] Contract 2: 3 months after [Completion of the whole of the <i>works</i>]	
43.2	The <i>defect correction period</i> is	2 weeks	
5	Payment		
50.1	The <i>assessment interval</i> is	20 th of each month	
51.1	The <i>currency of this contract</i> is the	South African Rand	

51.4	The <i>interest rate</i> is	the prime interest rate of the Standard Bank of South Africa Limited as amended from time to time
6	Compensation events	
60.1(13)	The place where weather is to be recorded is	The closest weather station to site.
	The <i>weather measurements</i> to be recorded for each calendar month are:	<ul style="list-style-type: none"> the cumulative rainfall (mm); the number of days with rainfall of more than 10mm; the number of days with minimum air temperature less than 0 degrees Celsius; the number of days with snow lying at +2 hours GMT; and these measurements: hourly wind direction and windspeed
	The <i>weather measurements</i> are supplied by	Contractor and verified with closest weather station to site.
	The weather data are the records of the past <i>weather measurements</i> for each calendar month which were recorded at	The closest weather station to site.
60.1(13)	Where no recorded data are available:- assumed values for the ten year return <i>weather data</i> for each <i>weather measurement</i> for each calendar month are:	As obtained by the contractor from the South African Weather Services verifiable records.
8	Risks and insurance	
80.1	These are additional <i>Employer's</i> risks	N/A
84.1	The <i>Contractor</i> provides these additional insurances: guide: lateral support if applicable, professional indemnity if contractor does design, SASRIA or any other insurance identified but not in table at cl 84.2.	<ol style="list-style-type: none"> The supplementary insurance is required. Such insurance shall comprise a Coupon Policy for Special Risks issued by the South African Special Risk Insurance Association. (SASRIA). Public liability insurance to be effected by the contractor for the sum of R10 000 000.00 (Ten Million Rand) per event with a deductible in an amount that the contractor deems appropriate. Professional Indemnity for the sum of R 10 000 000.00 (Ten Million Rand) per claim in respect of Contractors design liability.

84.1	The <i>Employer</i> provides these insurances from the Insurance Table:	None
84.1	The <i>Employer</i> provides these additional insurances:	Nil
84.1	The <i>Contractor</i> provides these additional insurances:	The supplementary insurance is required. Such insurance shall comprise a Coupon Policy for Special Risks issued by the South African Special Risk Insurance Association. (SASRIA)
84.2	If the <i>Employer</i> is to provide Plant and Materials:- the insurance against loss of or damage to the <i>works</i> , Plant and Materials is to include cover for Plant and Materials provided by the Employer for an amount of	N/A
84.2	Insurance against loss of or damage to the <i>works</i> , Plant and Materials, without limitation on the number of claims	Insured sum is the total of the Prices plus 10%
84.2	The minimum limit of indemnity for insurance in respect of death of or bodily injury to employees of the <i>Contractor</i> arising out of and in the course of their employment in connection with this contract for any one event is	as prescribed by the Compensation for Occupational Injuries and Diseases Act No. 130 of 1993 and the <i>Contractor's</i> common law liability for people falling outside the scope of the Act with a limit of Indemnity of not less than ZAR500 000 (Five hundred thousand Rands).
DATA FOR MAIN OPTION CLAUSES		
Option A	Option A: Priced Contract with <i>activity schedule</i>	There is no reference to Contract Data in this Option A and terms in italics are identified elsewhere in this Contract Data.
W1	Data for Option W1	
W1.1	The <i>Adjudicator</i> is (Name)	to be appointed as needed, see W1.2(3) below
W1.2(3)	The <i>Adjudicator nominating body</i> is:	The Party, which raises the dispute, shall select three adjudicators from the panel of adjudicators published by the South African Institution of Civil Engineering and/or Association of Arbitrators Southern Africa depending upon the technical or legal issues and nature of the dispute, determine their hourly fees and confirm that these adjudicators are available to adjudicate the dispute in question. The other Party shall then select, within seven (7) days, one of the three (3) nominated adjudicators to act as the

		adjudicator; failing which the chairperson for the time being of the Association of Arbitrators Southern Africa shall nominate an adjudicator on request from either party.		
W1.4(2)	The <i>tribunal</i> is:	Arbitration, arbitrator to be appointed as required.		
W1.4(5)	The <i>arbitration procedure</i> is	the latest edition of Rules for the Conduct of Arbitrations published by The Association of Arbitrators Southern Africa or its successor body.		
	The place where arbitration is to be held is	South Africa, Johannesburg		
	The person or organisation who will choose an arbitrator - if the Parties cannot agree a choice or - if the arbitration procedure does not state who selects an arbitrator, is	the Chairman for the time being or his nominee of the Association of Arbitrators Southern Africa or its successor body on application of either party.		
DATA FOR SECONDARY OPTION CLAUSES				
X1	Price adjustment for inflation			
	The <i>base date</i> for indices is	No price adjustment allowed		
	The proportions used to calculate the Price Adjustment Factor are:	0. [•]	linked to the index for	[•]
		0. [•]	linked to the index for	[•]
		0. [•]	linked to the index for	[•]
		0. [•]	linked to the index for	[•]
		1.00		
	The indices are those prepared by	[•] Indices to be obtained from Steel and Engineering Industries Federation of Southern Africa (SEIFSA), Producer Price Index (PPI) and Consumer Price Index (CPI).		
X7	Delay damages (but not if Option X5 is also used)			

	Delay damages for Completion of the whole of the works are	<p>The penalty per calendar day shall be calculated as per the current formula of penalty calculation by the Department of Public works up to a maximum of 10% of the contract value. Thereafter, the employer shall have a right during the identified delay period to intervene and accelerate the work or appoint a third party to assist or complete the works to reach practical completion at the planned period. The cost of the appointed third party work shall be borne by the contractor.</p> <p>EXAMPLE</p> <p>Estimated contract value = R2 500 000 (excluding VAT)</p> <p>Contract period = 18 months</p> <p style="text-align: center;">=R2 500 000 X0.0375/100</p> <p style="text-align: center;">= R937.50/day</p> <p>Therefore rounded off to the nearest R10-00 = R 940-00/day.</p> <p>To a maximum of 10% of the total of prices.</p>
X13	Performance Bond	
	The amount of the performance bond is	being a Guarantee issued by a registered entity approved by the <i>Employer</i> – fixed at ten percent (10%) of the contract Price at Contract Date, reducing to five percent (5%) of the contract Price when the <i>Contractor</i> achieves Completion and expires 1 month after the <i>defects date</i> .
	An advance payment bond	is required
X16	Retention	
	The <i>retention free</i> amount is	0%
	The <i>retention percentage</i> is	5% of the respective contract value (Contract 1 being NEC 3 ECC Option A contract for EPC and Contract 2 being NEC Term Services Agreement for O&M) where this amount is made up of retentions of up to 10% of monthly payment certificate.

X17	Low performance damages		
	The amounts for low performance damages are	amount	performance level for
		Contract 1: NEC 3 ECC Option A contract for EPC	
		Up to 10% of the value of Contract 1	As per Tests After Completion (Annexure V)
		Contract 2: NEC Term Services Agreement for Operations and Maintenance	
		Up to 10% of the value of Contract 2	As per Tests During Operation (Annexure W)
X18	Limitation of liability		
	The Contractor's liability to the Employer for indirect or consequential loss is limited to:	R0.00 (zero Rand)	
	For any one event, the Contractor's liability to the Employer for loss of or damage to the Employer's property is limited to:	cost for loss or damaged incurred by the Employer	
	The Contractor's liability for Defects due to his design which are not listed on the Defects Certificate is limited to	cost of the repair or reinstatement of property to original standard.	
	The Contractor's total liability to the Employer for all matters arising under or in connection with this contract, other than excluded matters, is limited to:	total of the Prices as at the start date as adjusted in terms of X1 if X1 applies to the contract	
	The end of liability date is	Contract 1: Latent defects 60 months after the Completion of the whole of the works/Sectional Completion/Commissioning per section of the works. Contract 2: Latent defects 24 months after the Completion of the whole of the works.	
X20	Key Performance Indicators (not used with Option 12)	Not Applicable	
	The incentive schedule for Key Performance Indicators is in	N/A	

	A report of performance against each Key Performance Indicator is provided at intervals of	Every two weeks
PART A – Additional Definitions		
Clause	Amendment	
11.2 Identified and defined terms	<p>Add the following new definition as clause 11.2(34):</p> <p>“Baseline Risk Assessment means the baseline risk assessment contemplated in regulation 5(1)(a) of the Construction Regulations.”</p> <p>Add the following new definition as clause 11.2(35):</p> <p>"Construction Agent means an “agent” as per the Construction Regulations which means a competent person who acts as a representative for a client (“client” in this regard being the Employer); the agent contemplated herein: (i) manages the health and safety on a construction project for the client; (ii) is registered with a statutory body (being the South African Council for Project and Construction Management Professions or any other statutory body approved by the chief inspector); and (iii) is qualified to perform the functions required by the Construction Regulations”;</p> <p>Add the following new definition as clause 11.2(36):</p> <p>“Construction Safety Officer means the construction safety officer as defined in the Construction Regulations.”</p> <p>Add the following new definition as clause 11.2(37):</p> <p>“Construction Regulations means the Construction Regulations as defined in clause 27.4.2 below”</p> <p>Add the following new definition as clause 11.2(38):</p> <p>“A Contractor Insolvency Event means and is considered to occur if:</p>	

- the Contractor commits an act which, if committed by an individual, would constitute an act of insolvency within the meaning of Sections 8 or 9(3)(a)(v) of the Insolvency Act 24 of 1936, as amended, or any equivalent legislation in any jurisdiction to which it is subject;
- the Contractor begins negotiations or takes any other step with a view to generally deferring, re-scheduling or otherwise re-adjusting all or a material part of its indebtedness or proposes or makes a general scheme, arrangement, assignment, or composition with or for the benefit of its creditors or a moratorium is proposed or agreed in respect of or affecting all or a material part of its indebtedness;
- the Contractor makes an application to court for business rescue supervision or for its winding-up (whether provisionally or finally);
- a court of competent jurisdiction grants an order winding-up the Contractor (whether provisionally or finally) or makes an order placing the Contractor under business rescue supervision;
- an application or other legal process (including the filing of any document commencing judicial process) is issued seeking an order for the winding-up of the Contractor (whether provisionally or finally) or placing the Contractor under business rescue supervision, except for so long as such application or other legal process is being contested in good faith and by appropriate means or except for the bona fide purpose of reconstruction, amalgamation, reorganisation, merger or consolidation; or
- a resolution is passed by:
 - the shareholders of the Contractor for the winding-up of the Contractor, whether by way of a members' or creditors' voluntary winding-up; or
 - the board of the Contractor for the Contractor to voluntarily begin business rescue proceedings and place himself under business rescue supervision."

Add the following new definition as clause 11.2(39):

- "Temporary Works is all temporary works of every kind required on site for the execution and Completion of the works and the remedying of any defects."

Add the following new definition as clause 11.2(40):

- "Intellectual Property" means (a) any copyright, design rights, patents, inventions, logos, business names, service marks and trademarks, internet domain names, moral rights, rights in databases, data, source codes, reports, drawings, specifications, know-how, business methods, trade secrets and confidential business information, semi-conductor rights, topography rights, whether registered or unregistered, rights in the nature of unfair competition and the right to sue for passing off; (b) applications for registration and the right to apply for registration for any of these rights; (c) all other intellectual property rights and similar forms of protection; existing anywhere in the world; and (d) all inventions (whether patentable or

	unpatentable and whether or not reduced to practice), all improvements thereto, and all patents, patent applications, and patent disclosures, together with all reissues, continuations, continuations-in-part, revisions, extensions, and re-examinations thereof,
PART B - Amendments and additions to Existing Core and Optional Clauses	
Clause	Amendment
12 Interpretation and the law	
12.5	Added the following clauses after clause 12.4 "Any extension, concession, waiver or relaxation of any action stated in this contract by the Parties, the <i>Project Manager</i> , the <i>Supervisor</i> , or the <i>Adjudicator</i> does not constitute a waiver of rights, and does not give rise to an estoppel unless the Parties agree otherwise and confirm such agreement in writing."
	Words denoting persons or parties shall include individuals and any organisation having legal capacity.
	In this contract, except where the context requires otherwise: <ul style="list-style-type: none"> provisions including the word "agree", "agreed" or "agreement" require the agreement to be recorded in writing, and; "written" or "in writing" means hand-written, type-written, printed or electronically made, and resulting in a permanent record.
	<ul style="list-style-type: none"> The headings to the sections, clauses and sub-clauses of the conditions of this contract are for convenience only and do not affect the construction or interpretation of the conditions of contract. Any word or expression defined in any clause in the Z clauses, unless the application of the word or expression is specifically limited to the clause in question, bears the meaning prescribed to the word or expression throughout the Z clauses.
	Week means a continuous period of 7 days. <ul style="list-style-type: none"> If the day for payment of any amount due by the Employer or Contractor in terms of this contract should fall on a Saturday, Sunday or official public holiday in the Republic of South Africa, the relevant day of payment is/are the next ordinary business day in the Republic of South Africa.
	<ul style="list-style-type: none"> Where figures are referred to in numerals and in words, if there is any conflict between the two, the words shall prevail.
	<ul style="list-style-type: none"> If any provision of this contract, which is not material to its efficacy as a whole, is rendered void, illegal or unenforceable in any respect under any law, the validity, legality and enforceability of the remaining provision is not in any way affected or impaired

	thereby and the parties shall endeavour in good faith to agree an alternative provision to the void, illegal or unenforceable provision.
	<ul style="list-style-type: none"> Unless otherwise specifically recorded in this contract, termination of this contract for any cause does not release a party from any liability which at the time of termination has already accrued to such party or which thereafter may accrue in respect of any act or omission prior to such termination. Similarly, the termination of this contract does not release a party from any obligation which, by its nature, is intended to survive such termination.
Using the Contractor's design	
22.1	<p>Delete core clause 22.1 in its entirety and replace it with the following clauses:</p> <p>Subject to each Party retaining title to its own Intellectual Property prior to the contract date, title to, copyright in and other Intellectual Property rights in any documents or other property created by the Contractor for or in connection with the Works vests in the Employer on creation and the Contractor hereby cedes and assigns all such rights to the Employer with effect from the date of creation vesting such Intellectual Property in the Employer.</p>
22.2	The Employer grants the Contractor a revocable license to use the Intellectual Property for the purposes of Providing the Works for the contract period.
22.3	Unless otherwise agreed by the Parties, the Contractor grants to the Employer a non-exclusive, perpetual, irrevocable, royalty free license to use any of the Contractor's Intellectual Rights, obtained prior to this contract, in connection with the Works and this contract.
22.4	All Intellectual Property created, enhanced or improvement arising from Providing the Works or from or in connection to the contract exclusively vests in the Employer.
22.5	If the Employer is prevented from receiving the Works or any part thereof as a result of any actual or alleged infringement of Intellectual Property rights, the Contractor must, at its cost, take all reasonable steps necessary to procure for the Employer the right to receive the Works or the relevant part thereof for its intended purpose.
22.6	<p>Modification or replacement of the Works</p> <p>If the Contractor fails to procure the necessary rights in accordance with this clause within a reasonable time, the Employer may direct the Contractor, at the Contractor's cost, to promptly (i) amend the Works or the relevant part thereof to avoid the infringement of Intellectual Property rights; or (ii) replace the Works or the relevant part thereof with Works that do not infringe Intellectual Property rights.</p>
26 Subcontracting	
26.1	<p>Core clause 26.1 to be amended as follows:</p> <p>The Contractor does not subcontract the whole or any part of the works without the written consent of the Employer, which consent shall be the sole discretion of the Employer. If the</p>

	Contractor subcontracts work, he is responsible for Providing the Works as if he had not subcontracted. This contract applies as if a Subcontractor's employees and equipment were the Contractor's. For the avoidance of doubt, the Contractor shall be responsible for the acts or defaults of any of its subcontractors, its agents or employees, as if they were the acts or defaults of the Contractor.
26.3	<p>Core clause 26.3 to be amended as follows:</p> <p>The Contractor submits the conditions of contract for each subcontract to the Project Manager and may redact all commercially sensitive information.</p>
26.4	<p>Add a new core clause 26.4 as follows:</p> <p>The Contractor shall procure from the Subcontractor all consents required in order to ensure that all the rights and obligations the Contractor may have under the subcontracts can be ceded and delegated to the Employer.</p>
26.5	<p>Add a new core clause 26.5 as follows:</p> <ul style="list-style-type: none"> • If the Contractor does not make payment of • any amount due and payable by him to a Subcontractor ("the Subcontractor debt") and the Project Manager considers that the Subcontractor debt adversely impacts on the progress of the Works or the obligations of the Contractor under the contract, Project Manager requests evidence of payment to the Subcontractor. In the absence of such evidence, the Employer may (at its own discretion) pay the Subcontractor debt directly to the Subcontractor concerned in which event such payment is, for all purposes under the Contract, regarded as a payment made on behalf of the Contractor and at the request of and with the approval and consent of the Contractor, as a payment towards the Prices. • Payment to the Subcontractor is conducted in terms of core clause 50.2 of the contract.
26.6	<p>Add a new core clause 26.6 as follows:</p> <p>All adverse effects as a result of or arising from the Subcontractor debt does not result in a compensation event.</p>
27 Health, safety and the environment	
27.4	<p>Clause 27.4 is deleted in its entirety and replaced with the following:</p> <p>Health and Safety specification</p>
27.4.1	The <i>Contractor</i> takes all reasonable steps and precautions to assess the Site, consider and receive all relevant information on the Site and health and safety related to the <i>works</i> , maintain the health and safety of persons in and about the execution of the <i>works</i> .
27.4.2	The <i>Contractor</i> acknowledges that the Occupational Health and Safety Act No. 85 of 1993 and the regulations promulgated therein ("the Act"); and the Construction Regulations 2014 promulgated under the Act ("the Construction Regulations"), Section 27 (2) of the Disaster

	Management Act, 2002 and Consolidated Directions on Occupational Health and Safety Measures at Certain Workplaces will in all respects be applicable to this contract and the works.
27.4.3	The <i>Employer</i> appoints the <i>Contractor</i> as the “Principal Contractor” (as defined and provided for under the Construction Regulations 2014) for the Site.
27.4.4	Accordingly, the <i>Contractor</i> is responsible for all duties of the “Principal Contractor” as defined and provided for under the Act and the Construction Regulations 2014 including but not limited to those obligations defined and provided for in Annexures A, B and C and all required Regulations and Standards applicable to the work of this contract.
27.4.5	The <i>Contractor</i> shall appoint a SACPCMP Registered Construction Health & Safety Officer for the Works and all other site specific appointments as per Legislation requirements.
27.4.5.1	
27.4.6	<p>The <i>Contractor</i> confirms that it has received sufficient information about the Site and the works in order to:</p> <ul style="list-style-type: none"> • comply with the provisions of the OHS Act and the Construction Regulations 2014, • comply with the provisions of this clause; • adhere to the <i>Employer's</i> health and safety baseline specification, Baseline Risk Assessment and SHEQ Policy as set out in Annexures A, B and C; • be properly appointed in accordance with Section 37(2) of the Act
27.4.7	The <i>Contractor</i> acknowledges that the Project Manager acts as the <i>Employer's</i> “Implementing Agent” in respect of all obligations which the <i>Employer</i> has as “Client” in the Construction Regulations 2014 and the Act.
27.4.8	Without limitation, the <i>Contractor</i> :
27.4.8.1	notwithstanding any actions which the <i>Employer</i> may take, accepts sole liability for due compliance with the relevant duties, obligations, prohibitions, arrangements and procedures imposed by the Act, all its regulations (including the Construction Regulations 2014) and Annexures A, B and C. By entering into this contract it shall be deemed that the parties have agreed in writing to the above provisions in terms of Section 37 (2) of the Act;
27.4.8.2	acknowledges and confirms that the Prices includes a sufficient amount for proper compliance with the Construction Regulations 2014, Section 27 (2) of the Disaster Management Act, 2002 and Consolidated Directions on Occupational Health and Safety Measures at Certain Workplaces and all applicable health and safety laws, regulations, rules, guidelines, procedures and all obligations imposed by this contract and Annexures A, B and C and generally for the proper maintenance of health and safety in and about the execution of works;

27.4.8.3	undertakes, in and about the execution of the <i>works</i> , to comply with all applicable health and safety laws, regulations, rules, guidelines and procedures otherwise provided for under this contract and shall ensure that all sub-contractors, employees and Others under the <i>Contractor's</i> direction and control, likewise observe and comply with the foregoing; and
27.4.8.4	indemnifies the <i>Employer</i> against any loss, damage or claim suffered by the <i>Employer</i> due to a failure to comply with any provision of this clause 27.4 by the <i>Contractor</i> .
27.4.8.5	acknowledges and confirms that a Construction Safety Officer will be appointed by the <i>Contractor</i> for the Project and that the Prices includes a sufficient amount for the appointment of such.
27.4.9	The <i>Contractor</i> and his designer shall accept full responsibility and liability to comply with the Act, the Construction Regulations and Annexures A, B and C for the design of the Temporary <i>Works</i> and those parts of the Permanent <i>Works</i> which the <i>Contractor</i> is responsible to design in terms of this contract;
27.4.10	The <i>Employer</i> retains a right to inspect, review, obtain copies of all documents regarding, attend and participate in all meetings regarding; all inquiries, audits and reports conducted under this contract including but not limited to those that are conducted in accordance with:
27.4.10.1	Annexures A, B and C of this contract; and
27.4.10.2	Section 31 and/or 32 of the Act, its regulations and the Construction Regulations following any incident involving the <i>Contractor</i> and/or sub-contractor and/or their employees.
27.4.11	The <i>Contractor</i> shall notify the Project Manager and copy in the <i>Employer</i> in writing of all inquiries, audits, reports, investigations, complaints or criminal charges which may arise pursuant to <i>works</i> performed under this contract.
27.4.12	The <i>Employer</i> and the Project Manager shall, at all times during construction and for a period of 5 (five) years after Completion, have the right to access and inspect any part of the Site/ <i>works</i> and all documents, reports, designs, specifications whatsoever that are prepared pursuant to any clause of this contract.
27.4.13	The <i>Contractor</i> liaises with the <i>Employer</i> and the Project Manager regarding all issues related to this clause 27, and in particular, complies with all reasonable requests from the Project Manager to (i) attend any meetings and/or (ii) provides any documents, audits and reports; required by the <i>Employer</i> or Project Manager.
27.4.14	The <i>Contractor</i> complies with the Baseline Risk Assessment provided by the <i>Employer</i> . Notwithstanding the foregoing, the <i>Contractor</i> prepares its own Baseline Risk Assessment and complies with it where such Baseline Risk Assessment provides additional risks to those noted by the <i>Employer</i> or the <i>Project Manager</i> .
3 Time	

<p>37.1</p> <p>The Contractor's recovery plan</p>	<p>Add the following new clause 37</p> <p>"Where actual progress on Site is not in accordance with the most current programme or where the <i>Employer</i> or <i>Project Manager</i> is of the opinion, at any time during the execution of the <i>works</i>, that the <i>Contractor</i> will not achieve Completion on the date stated in the most current programme, the <i>Contractor</i> shall prepare a recovery plan within 14 days of receipt of an instruction from the <i>Employer</i> or <i>Project Manager</i> requesting such recovery plan detailing:</p> <ul style="list-style-type: none"> the Contractor's plan to ensure that the works will achieve Completion on the date stated in the most current programme; all additional resources which will be employed by the Contractor in order to ensure that the Contractor achieves Completion on the date stated in the most current programme; any other information which may be required by the Employer or Project Manager to ascertain that the Contractor will achieve Completion on the date stated in the most current programme."
<p>5 Payment</p>	
<p>51.2</p>	<p>Amend this clause by deleting the second and the third sentences of the clauses and replace them with the following:</p> <p>If a certified payment is late by more than 8 weeks, interest is paid on the late payment. Interest is assessed from 4 weeks after the date by which the late payment should have been made until the date when the late payment is made, and is included in the first assessment after the late payment is made.</p>
<p>51 Payment</p>	<p>Add the following new clauses after clause 51.4.</p>
<p>51.5</p>	<p>Within one week of receiving a payment certificate from the <i>Project Manager</i> in terms of core clause 51.1, the <i>Contractor</i> provides the <i>Employer</i> with a tax invoice in accordance with the <i>Employer's</i> procedures stated in the Works Information, showing the amount due for payment equal to that stated in the payment certificate.</p>
<p>51.6</p>	<p>If the <i>Contractor</i> does not provide a tax invoice in the form and by the time required by this contract, the time by when the <i>Employer</i> is to make a payment is extended by a period equal in time to the delayed submission of the correct tax invoice.</p>
<p>51.7</p>	<p>The <i>Contractor</i> (if registered in South Africa in terms of the companies Act) is required to comply with the requirements of the Value Added Tax Act, no 89 of 1991 (as amended) and to include the <i>Employer's</i> VAT number on each invoice the Contractor submits for payment.</p>

6 Compensation Events	
61 Notifying compensation events	
61.3	<p>The last paragraph is deleted and substituted with the following:</p> <p><i>"In clarification, notwithstanding the Project Manager notifying the Contractor of a compensation event, if the Contractor does not notify a compensation event within the eight weeks of becoming aware of the event or ought reasonably to become aware of the event, he is not entitled to a change in the Prices, the Completion Date or a Key Date."</i></p>
9 Termination	
91.1	<p>Amend this clause by the addition of the following at the end of the second main bullet point, fourth sub-bullet point, after the words "against it":</p> <p><i>"or the Contractor commits a Contractor Insolvency Event (R5),"</i></p>
91.3	<p>Amend this clause by adding the following at the end of the clause:</p> <ul style="list-style-type: none"> • <i>"failed to effect any of the required insurances(R22);</i> • <i>failed to provide a satisfactory recovery plan pursuant to Clause 37 (The Contractor's recovery plan) (R23); or</i> • <i>failed to comply with the provision of Clause Z3 (Broad Based Black Economic Empowerment) (R24).</i> <p>and for terminating for R22 to R24 the same procedures and payment on termination as those applied for reasons R1 to R15 or R18 stated in the Termination Table in clause 90.2 apply."</p>
9.0	Insert the following new clause 9.4
9.4 Termination for convenience	<p>The <i>Employer</i> is entitled to terminate the Contract, at any time for the <i>Employer's</i> convenience, by giving notice of such termination to the <i>Contractor</i>. The termination shall take effect 28 days after the later of the dates on which the <i>Contractor</i> receives this notice or the <i>Employer</i> returns the performance bond and all monies held in retention, unless there are outstanding calls/claims thereon in which event, and if applicable, the <i>Employer</i> returns the performance bond and all monies held in retention promptly after the last of the outstanding calls/claims have been met. The <i>Employer</i> does not terminate the Contract under this sub-clause in order to execute the <i>works</i> himself or to arrange for the <i>works</i> to be executed by another contractor. The same procedures on termination as those applied for reasons R1 to R15 or R18 stated in the Termination Table in clause 90.2 apply. The Contractor shall only be entitled to costs incurred at the date of termination.</p>
Option X2: Changes in the Law	

X2.2	<p>Amend this clause by the addition of the following new clause:</p> <p>Notwithstanding anything contained in this clause or this agreement, a “change in law” does not include any law or piece of legislation that is enacted or made but not yet in force as at the date when the tender is submitted, or any proposed or draft law that is promulgated or issued for comment at any time before the tender is submitted if and to the extent that such law when enacted or made and brought into effect is materially unchanged</p>
Option X7: Delay Damages	
X7.4	<p>Amend this clause by adding of the following new clause: (if applicable in this contract)</p> <p>“If the amount due for the Contractor’s payment of delay damages reaches the limits stated in this Contract Data for Option X7 or Options X5 and X7 used together, the Employer may terminate the Contractor’s obligation to Provide the Works using the same procedures and payment on termination as those applied for reasons R1 to R15 or R18 stated in the Termination Table in clause 90.2.”</p>
Option X13: Performance Bond	Amend this clause by adding the following new clause at the end of this clause: (if applicable in this contract)
X13.2	<p>The <i>Contractor</i> ensures that the performance bond is valid and enforceable until the <i>Contractor</i> has Provided the Works and remedied any and all <i>defects</i> therein. If the terms of the performance bond specifies its expiry date, then the Contractor extends the validity of the performance bond 28 days prior to such an expiry date, such that the performance bond lapses at the later of:</p> <ul style="list-style-type: none"> the date of issue of the Defects Certificate; or the date when the last <i>defect</i> notified has been remedied or accepted in accordance with this contract.
X13.3	<p>The <i>Employer</i> may make a claim under the performance bond, for amounts to which the <i>Employer</i> is entitled under the contract in the event of:</p> <ul style="list-style-type: none"> failure by the <i>Contractor</i> to extend the validity of the performance bond as described in the preceding paragraph, in which event the <i>Employer</i> may claim the full amount of the performance bond, failure by the <i>Contractor</i> to pay the <i>Employer</i> an amount due, as either agreed with the <i>Contractor</i> or assessed by the Project Manager (or otherwise determined) in accordance with the provisions of this contract, within 28 days after this agreement, assessment or determination,

	<ul style="list-style-type: none"> failure by the <i>Contractor</i> to remedy a default within 28 days after receiving the <i>Employer's</i> notice requiring the default to be remedied, or the occurrence of any one of the following termination reasons: R1 to R15, R18 and R22 to R24.
X13.4	The <i>Employer</i> indemnifies and hold the <i>Contractor</i> harmless against and from all damages, losses and expenses (including legal fees and expenses) resulting from a claim under the performance bond to the extent to which the <i>Employer</i> is not entitled to make the claim.
X13.5	<p>Step Down</p> <p>The performance bond reduces by half its value on the date of issue of the Certificate of Completion.</p> <p>The performance bond expires/lapses on the later of:</p> <ul style="list-style-type: none"> the date of issue of the Defects Certificate; or the date when the last <i>defect</i> notified has been remedied or accepted in accordance with this contract.
PART C – Additional Clauses (entitled Z-Clauses)	
Z1	Cession delegation and assignment
Z1.1	The <i>Contractor</i> does not cede, delegate or assign any of its rights or obligations to any person without the written consent of the <i>Employer</i> .
Z1.2	<p>Notwithstanding the above, the <i>Employer</i> may, on written notice to the <i>Contractor</i>, cede and delegate its rights and obligations under this contract to a Related Party or a Client of the <i>Employer</i>.</p> <p>For the purpose hereof</p>
Z1.2.1	a “related party” means any entity that directly or indirectly, through one or more intermediaries, controls or is controlled by, or is under common control with the employer and includes any other “Organ of State” as defined in section 239 of the Constitution of the Republic of South Africa, 1996 and any entity or Organ of State for whom the employer carries out the works or acts as an implementing agent; and “Control” means the beneficial ownership of the majority in number of the issued equity of any entity (or the whole or majority of the entity’s assets), and/or the right or ability to direct or otherwise control the entity or the votes attaching to the majority of the entity’s equity and “controlled” or “under common control” shall have a similar meaning.
Z2	Joint ventures

Z2.1	If the <i>Contractor</i> constitutes a joint venture, consortium or other unincorporated grouping of two or more persons or organisations then these persons or organisations are deemed to be jointly and severally liable to the <i>Employer</i> for the performance of this contract.
Z2.2	Unless already notified to the <i>Employer</i> , the persons or organisations notify the <i>Project Manager</i> within two weeks of the Contract Date of the key person who has the authority to bind the <i>Contractor</i> on their behalf.
Z2.3	The <i>Contractor</i> does not substantially alter the composition of the joint venture, consortium or other unincorporated grouping of two or more persons without the consent of the <i>Employer</i> having been given to the <i>Contractor</i> in writing.
Z3	Broad Based Black Economic Empowerment, Construction Industry Development Board grading and the valid and active Tax Compliance Status Pin issued by SARS.
Z3.1	The <i>Contractor</i> warrants that it will:
Z3.1.1	comply with all laws including the <i>Broad Based Black Economic Empowerment Act 53 of 2003</i> , its regulations and Codes of Good Practice; and the <i>Preferential Procurement Act 5 of 2000</i> and all its regulations;
Z3.1.2	maintain or improve (i) the BEE rating stated in its BEE certificate (ii) the contractor's Construction Industry Development Board grading, and (iii) its valid and active Tax Compliance Status Pin issued by SARS submitted at tender stage; and
Z3.1.3	not conduct any Fronting practices as defined in the Codes of Good Practice.
Z4	Change of Broad Based Black Economic Empowerment (B-BBEE) status
Z4.1	Where a change in the <i>Contractor's</i> legal status, ownership or any other change to his business composition or business dealings results in a change to the <i>Contractor's</i> B-BBEE status, the <i>Contractor</i> notifies the <i>Employer</i> within seven days of the change.
Z4.2	The <i>Contractor</i> is required to submit an updated verification certificate and necessary supporting documentation confirming the change in his B-BBEE status to the <i>Project Manager</i> within thirty days of the notification or as otherwise instructed by the <i>Project Manager</i> .
Z4.3	Where, as a result, the <i>Contractor's</i> B-BBEE status has decreased since the Contract Date the <i>Employer</i> may either re-negotiate this contract or alternatively, terminate the <i>Contractor's</i> obligation to Provide the Works.
Z4.4	Failure by the <i>Contractor</i> to notify the <i>Employer</i> of a change in its B-BBEE status may constitute a reason for termination. If the <i>Employer</i> terminates in terms of this clause, the

	procedures on termination are P1, P2 and P3 as stated in clause 92, and the amount due is A1 and A3 as stated in clause 93.
Z5	Ethics
Z5.1	Any offer, payment, consideration, or benefit of any kind made by the <i>Contractor</i> , which constitutes or could be construed either directly or indirectly as an illegal or corrupt practice, as an inducement or reward for the award or in execution of this contract, including Fronting as referenced in Sub-Clause Z3.1.3, constitutes grounds for terminating the <i>Contractor's</i> obligation to Provide the Works or taking any other action as appropriate against the <i>Contractor</i> (including civil or criminal action).
Z5.2	<p>The <i>Employer</i> may terminate the <i>Contractor's</i> obligation to Provide the Works if the <i>Contractor</i> (or any member of the <i>Contractor</i> where the <i>Contractor</i> constitutes a joint venture, consortium or other unincorporated grouping of two or more persons or organisations) is found guilty by a competent court, administrative or regulatory body of participating in illegal or corrupt practices.</p> <p>Such practices include making of offers, payments, considerations, or benefits of any kind or otherwise, whether in connection with any procurement process or contract with the <i>Employer</i> or other people or organisations and including in circumstances where the <i>Contractor</i> or any such member is removed from the an approved vendor data base of the <i>Employer</i> as a consequence of such practice.</p>
Z5.3	Notwithstanding the provisions of core clause 90.2, the procedures on termination in terms of this clause are P1, P2 and P3 as stated in the core clause 92 and the amount due is A1 and A3 as stated in core clause 93.
Z6	Confidentiality
Z6.1	The <i>Contractor</i> does not disclose or make any information arising from or in connection with this contract available to Others. This undertaking does not, however, apply to information which at the time of disclosure or thereafter, without default on the part of the <i>Contractor</i> , enters the public domain or to information which was already in the possession of the <i>Contractor</i> at the time of disclosure (evidenced by written records in existence at that time). Should the <i>Contractor</i> disclose information to Others in terms of clause 25.1, the <i>Contractor</i> ensures that the provisions of this clause are complied with by the recipient.
Z6.2	If the <i>Contractor</i> is uncertain about whether any such information is confidential, it is to be regarded as such until notified otherwise by the <i>Project Manager</i> .
Z6.3	In the event that the <i>Contractor</i> is, at any time, required by law to disclose any such information which is required to be kept confidential, the <i>Contractor</i> , to the extent permitted by law prior to disclosure, notifies the <i>Employer</i> so that an appropriate protection order and/or any other action can be taken if possible, prior to any disclosure. In the event that such protective order is not, or cannot, be obtained, then the <i>Contractor</i> may disclose that

	portion of the information which it is required to be disclosed by law and uses reasonable efforts to obtain assurances that confidential treatment will be afforded to the information so disclosed.
Z6.4	The taking of images (whether photographs, video footage or otherwise) of the <i>works</i> or any portion thereof, in the course of Providing the Works and after Completion, requires the prior written consent of the <i>Project Manager</i> . All rights in and to all such images vests exclusively in the <i>Employer</i> .
Z6.5	The <i>Contractor</i> ensures that all its subcontractors abide by the undertakings in this clause.
Z9	<i>Employer's limitation of liability</i>
Z9.1	The <i>Contractor's</i> entitlement under the indemnity in 83.1 is provided for in 60.1(14) and the <i>Employer's</i> liability under the indemnity is limited to compensation as provided for under the compensation events stated in this contract.
Z10	<i>Employer's Step-in Rights and Additional Remedies</i>
Z10.1	In the event the <i>Contractor</i> and/or his subcontractor:
Z10.1.1	fails to carry out any obligation under the contract and the Works Information and fails to make good such failure and remedy it despite being requested to do so by the <i>Project Manager</i> in accordance with notices under Sub-Clause 16.1 (Early Warning) and/or Sub-Clause 13.1 (Communications), or
Z10.1.2	commits a breach of the Contract which reasonably places the project at risk of non-completion by the Completion Date, or non-Completion; or
Z10.1.3	commits a material breach of contract,
	the <i>Employer</i> may, without prejudice to its other rights in clause 9 (Termination), powers and remedies under the contract or in law, be entitled to step-in and take over the <i>works</i> , and on the account of the <i>Contractor</i> and at the <i>Contractor's</i> risk, to (i) make good the failure and remedy it, or complete the <i>works</i> himself, or (ii) call upon other contractors to make good the failure and remedy it or complete the <i>works</i> , or (iii) to call upon other contractors to partner with the <i>Contractor</i> to make good the failure and remedy it, or complete the <i>works</i> . Further, notwithstanding anything contained in this contract, where the <i>Employer</i> has "stepped-in" the <i>Contractor</i> shall remain responsible as if the <i>works</i> were executed by the <i>Contractor</i> for the <i>works</i> up to the Completion Date.
Z10.2	The <i>Contractor</i> shall co-operate with the <i>Employer</i> and facilitate and permit the use of all required Contractor's Equipment, Goods, information, materials and other matter (including Contractor's Documents and all other drawings, CAD files, technical data, models, plans, designs, diagrams, evaluations, details, specifications, schedules, reports, calculation results, manuals or other documents or recorded information (electronic or otherwise) which have been or are at any time prepared by or on behalf of the <i>Contractor</i> under the Contract or otherwise for and/or in connection with the <i>works</i>) and shall generally do all reasonable

	things required by the <i>Project Manager</i> to achieve this end; provided that where the foregoing constitute proprietary information, the <i>Contractor's</i> obligation hereunder shall be limited to furnishing <i>works</i> specific information in a form capable of being disclosed to third parties or providing assistance to third parties without requiring the <i>Contractor</i> to disclose non <i>works</i> -specific source codes or other proprietary information.
Z10.3	Any information, materials and other matter made available by the <i>Contractor</i> under this Sub-Clause Z.10 shall be used solely and exclusively for the purpose of making good and remedying the <i>Contractor's</i> failure and shall thereafter be returned to the <i>Contractor</i> . Any such information, materials and other matter which is made available by the <i>Employer</i> to other persons as contemplated in this Sub-Clause Z.13 shall be made available strictly in accordance with the foregoing and subject to a confidentiality undertaking.
Z11	Employer Procured Materials and Goods
Z11.1	The <i>Employer</i> is entitled but not obliged to procure materials and goods on behalf of the <i>Contractor</i> . The <i>Contractor</i> may request that the <i>Employer</i> procures materials and goods on behalf of the <i>Contractor</i> .
Z11.2	Should the <i>Employer</i> exercise this right, or should the <i>Employer</i> accept the <i>Contractor's</i> request, the <i>Contractor</i> shall:
Z11.2.1	issue to the <i>Project Manager</i> a list of all materials and goods the <i>Contractor</i> requires;
Z11.2.2	state in the list considered above, the time within which such materials and goods must be provided;
Z11.2.3	take delivery of such materials and goods provided by the <i>Employer</i> ;
Z11.3	The <i>Contractor</i> shall be responsible for and takes the risk on all materials and goods after taking delivery of such materials and goods at Site and indemnifies the <i>Employer</i> against all losses or costs arising from any damage, loss or theft of such materials and goods.
Z11.4	The <i>Contractor</i> shall not be entitled to any extension of time and costs for the late delivery of any materials and goods to be procured by the <i>Employer</i> under the provision of this clause.
Z11.5	The direct cost of all materials and goods procured by the <i>Employer</i> on behalf of the <i>Contractor</i> in accordance with the provisions of this clause shall be deducted from each payment due to the <i>Contractor</i>
Z11.6	The <i>Contractor</i> acknowledges that all <i>Employer</i> supplied materials and goods remain the property of the <i>Employer</i> .
Z12	Contractor Undertaking re CIDB and Tax Certificates

Z12.1	The <i>Contractor</i> shall ensure that all certificates, clearances and the like, including specifically any certificates required to be obtained by the <i>Contractor</i> for purposes of the contract in terms of the Construction Industry Development Board and the Value Added Tax Act, no 89 of 1991, remain in full force and effect up until the Completion Date.
Z12.2	Failure by the <i>Contractor</i> to notify the <i>Employer</i> of the expiry of any requisite certificate may constitute a reason for termination. If the <i>Employer</i> terminates in terms of this clause, the procedures on termination are P1, P2 and P3 as stated in clause 92, and the amount due is A1 and A3 as stated in clause 93. In addition to the <i>Employer's</i> right to terminate, should any requisite certificate that the <i>Contractor</i> is required to obtain expire or be null and void for any reason whatsoever, the <i>Employer</i> may withhold any payments due to the <i>Contractor</i> until such time as the <i>Contractor</i> provides the <i>Employer</i> and / or <i>Project Manager</i> with a valid and / or updated certificate, as the case may be.
Z13	RIGHT TO AUDIT
Z13.1	The <i>Employer</i> shall be entitled to, within 2 (two) Business Days of the giving of notice to the <i>Contractor</i> to such effect, conduct an audit of all relevant books, records, systems, processes, procedures and documents of the <i>Contractor</i> in order to verify compliance by the <i>Contractor</i> with its obligations in terms of this Contract and/or to assess any entitlement or claimed entitlement of the <i>Contractor</i> under this Contract or to investigate any allegations with regard to possible criminal activities or breach of DBSA policies or procedures.
Z13.2	The <i>Contractor</i> shall co-operate and render all assistance requested by the <i>Employer</i> relating to such audit. In addition, the <i>Contractor</i> shall provide the <i>Employer</i> with access to all such books, records, systems, data and documents of the <i>Contractor</i> that are relevant to this Contract, the <i>Contractor's</i> obligations under this Contract and/or any entitlement or claimed entitlement of the <i>Contractor</i> under this Contract and to any premises, shareholders, partners, members, subcontractors and Personnel of the <i>Contractor</i> for the purposes of conducting such audit. The <i>Employer</i> shall have the right to take copies of any records and information the <i>Employer</i> reasonably require to assist in connection with any such audit.
Z13.3	The <i>Contractor</i> shall maintain all data, records and documentation relating to this Contract and keep full and proper records in connection with providing the Works and all matters related thereto (whether contained in documents or in electronic format) for the period of this Contract, and for a period of at least 5 (five) years after termination or completion of all of the Works (as the case may be).
Z13.4	The <i>Contractor</i> shall ensure that the rights in this clause 18 also apply to any subcontractors and that the <i>Employer</i> be afforded the same auditing rights by the subcontractors.
Z13.5	The <i>Employer</i> shall keep all information obtained in terms of this clause 18 confidential and not disclose it to any third party. In the event that the <i>Employer</i> is, at any time, required by law to disclose any such information which is required to be kept confidential, the <i>Employer</i> , to the extent permitted by law prior to disclosure, notifies the <i>Contractor</i> so that an appropriate protection order and/or any other action can be taken if possible, prior to any disclosure. In the event that such protective order is not, or cannot, be obtained, then the <i>Employer</i> may disclose that portion of the information which it is required to be disclosed by

	law and uses reasonable efforts to obtain assurances that confidential treatment will be afforded to the information so disclosed.
--	--

C1.2 CONTRACT DATA (Continued)

Part two – Data provided by the *Contractor*

[Instructions to the contract compiler: (delete this notes before issue to tenderers with an enquiry)

Whenever a cell is shaded in the left hand column it denotes this data is optional and would be required in relation to the option selected. In the event that the option is not required select and delete the whole row.]

Notes to a tendering contractor:

1. Please read both the NEC3 Engineering and Construction Contract (April 2013) and the relevant parts of its Guidance Notes (ECC3-GN)² in order to understand the implications of this Data which the tenderer is required to complete. An example of the completed Data is provided on pages 152 to 154 of the ECC3 Guidance Notes.
2. The number of the clause which requires the data is shown in the left hand column for each statement however other clauses may also use the same data
3. Where a form field like this [] appears, data is required to be inserted relevant to the option selected. Click on the form field **once** and type in the data. Otherwise complete by hand and in ink.

Completion of the data in full, according to Options chosen, is essential to create a complete contract.

**Statements given
in all contracts**

- The *Contractor* is
Name
Address
.....
- The *direct fee percentage* is. %.
- The *subcontracted fee percentage* is. %.
- The *working areas* are the Site and
.
- The key people are
(1) Name
Job
Responsibilities
.....
Qualifications
Experience
.....
(2) Name
Job
Responsibilities
.....
Qualifications
.....
Experience
.....
.....

**Optional
statements**

- The following matters will be included in the Risk Register (note as above with data by Employer this is risks identified at tender stage)

.....
.....
.....
.....

If the *Contractor* is to provide Works Information for his design

- The Works Information for the *Contractor's* design is in

.....
.....
.....
.....
.....
.....

If a programme is to be identified in the Contract Data

- The programme identified in the Contract Data is.

If the *Contractor* is to decide the *completion date* for the whole of the works

- The *completion date* for the whole of the works is.

**Data for the
Shorter Schedule
of Cost
Components**

- The *activity schedule* is

..

- The tendered total of the Prices is.

....

- The percentage for people overheads is %.

- The published list of Equipment is the last edition of the list published by

.....

- The percentage for adjustment for Equipment in the published list is

..... % (state plus or minus).

- The rates for other Equipment are

Equipment	size or capacity	rate
-----------	------------------	------

.....
-------	-------	-------

.....
-------	-------	-------

.....
-------	-------	-------

.....
-------	-------	-------

- The hourly rates for Defined Cost of design outside the Working Areas are
- | category of employee | hourly rate |
|----------------------|-------------|
|----------------------|-------------|

.....
-------	-------

.....
-------	-------

.....
-------	-------

.....
-------	-------

- The percentage for design overheads is %.

- The categories of design employees whose travelling expenses to and from the Working Areas are included in Defined Cost are

.....

.....

C1.3 PERFORMANCE BOND

Pro-Forma NEC3 ECC Variable Performance Bond for Works and Maintenance – Demand Guarantee

To: *Employer*

Dear Sirs

Reference No. [●] *[Drafting Note: Guarantor/Bank reference number to be inserted]*

Performance Bond: *[Drafting Note: Name of Contractor to be inserted]*

Employer: Contract Reference - [●] *[Drafting Note: Contract reference number to be inserted]*

1. In this Guarantee:

1.1 the following words and expressions have the following meanings:

- 1.1.1 “Guarantor” - means [●], [●] Branch, (Registration No. [●]); *[Drafting Note: Name of Guarantor to be inserted]* [●] **Financial Services Board Registration number [●]**
NB: Guarantees submitted must be issued by either an insurance company duly registered in terms of the Short-Term Insurance Act, 1998 (Act 53 of 1998) or by a bank duly registered in terms of the Banks Act, 1990 (Act 94 of 1990) No alterations or amendments of the wording of the pro-forma will be accepted unless approved prior to it been issued by the Employer.
- 1.1.1 “Guarantor’s Address” - means [●]; *[Drafting Note: Guarantor’s physical address to be inserted]*
- 1.1.2 “Contract” - means the written agreement entered into between *Employer* and the *Contractor* on or about [●] [●] 200[●] (Contract Reference No. [●]), as amended, varied, restated, novated or substituted from time to time; *[Drafting Note: signature date and Contract reference number to be inserted]*
- 1.1.3 “Contractor” - means [●] a [●] registered in accordance with the laws of [●] with registration number [●]; *[Drafting Note: Name and details of Contractor to be inserted]*
- 1.1.4 “Employer” - means The Development Bank of Southern Africa Limited, acting through its Infrastructure Delivery Division (the “IDD”), being a development finance institution reconstituted and incorporated as a juristic person in terms of section 2 of the Development Bank of Southern Africa Act No 13 of 1997;
- 1.1.5 “Expiry Date” – means the date of issue of the Defects Certificate or such later date as may be determined by the application of clause 3.3;
- 1.1.6 “this Guarantee” - means this Performance Bond;
- 1.1.7 “Guaranteed Sum” - means the sum of [● - figure] ([● - words]) as reduced from time to time as provided for in paragraph 3 below; *[Drafting Note: Maximum aggregate Guarantee amount to be inserted not exceeding 10% of the contract sum]*

- 1.1.8 “Project Manager” - means [●] a [●] registered in accordance with the laws of [●] with registration number [●]; and
- 1.1.9 a “recovery statement”, an “interim payment certificate”, a “Payment Certificate”, a “Certificate(s) of Completion” or “Defect Certificate” shall mean any such certificate as issued by the Project Manager;
- 1.2 words and expressions defined in the Contract shall, unless otherwise defined in this Guarantee or otherwise required by the context of this Guarantee, have the same meanings in this Guarantee as those ascribed to them in the Contract, albeit that the Contract itself, and any terms as defined therein, are merely referenced for convenience and not to create an accessory obligation.
2. At the instance of the *Contractor*, the Guarantor hereby confirms that we hold the Guaranteed Sum at the disposal of *Employer*, as security for the proper performance by the *Contractor* of all of his obligations in terms of and arising from the Contract, and hereby irrevocably and unconditionally both agree and undertake to pay to *Employer*, on written demand from *Employer* envisaged in paragraph 3 below and received prior to the Expiry Date, any amount or amounts as may be so demanded from time to time, subject to a maximum of the Guaranteed Sum in the aggregate.
3. The Guarantor’s liability shall be limited to the diminishing amounts of the Guaranteed Sum as follows:
- 3.1 Maximum Guaranteed Sum (not exceeding 10% of the contract sum) in the amount of:
- [● – amount in figures] ([● – amount in words]),**
- from and including the date of issue of this Guarantee and up to and including the Completion Date.
- 3.2 Reducing the Guaranteed Sum (not exceeding 5.0% of the contract sum) in the amount of:
- [● – amount in figures] ([● – amount in words]),**
- from and including the day after the Completion Date up to and including the date of the issue of the Defects Certificate.
- 3.3 Reducing the Guaranteed Sum (not exceeding 0% of the contract sum) in the amount of:
- R nil**
- from and including the day after the date of the issue of the Defect Certificate, where after this Guarantee for Construction shall expire. Where the final payment certificate reflects payment due to the *Employer* this Guarantee shall expire upon payment of the full amount certified. The Guarantor’s liability limits set out in paragraphs 3.1 to 3.3 shall apply in respect of any claim received by the Guarantor during the Security validity.
4. A demand for payment under this Guarantee shall be made in writing at the Guarantor’s address and shall:
- 4.1 confirm the “Guaranteed Sum” at the time of the demand;
- 4.2 state the amount claimed (“the Demand Amount”); and
- 4.3 state that the Demand Amount is payable to *Employer* in the circumstances contemplated in the Contract:

- 4.3.1 in regard to sums certified, shall state the Demand Amount to be the amount so certified and shall:
- 4.3.1.1 state that such first written demand notice issued by *Employer* to the Guarantor at the Guarantor's Address, with a copy to the *Contractor*, records that a period of seven (7) calendar days has elapsed since the issue of the first written demand notice in terms of paragraph 4.3.1.2 and that the sum certified has not been paid to date. *Employer* herewith calls up this Guarantee and demands payment of the sum certified from the Guarantor;
- 4.3.1.2 be accompanied by a copy of a preceding first written demand notice issued by *Employer* to the *Contractor* stating that payment of a sum certified by the Project Manager in an interim or final payment certificate has not been made in terms of the Contract and failing such payment within seven (7) calendar days, *Employer* intends to call upon the Guarantor to make payment in terms of paragraph 4.3.1.1;
- 4.3.1.3 and
- 4.3.1.4 shall be accompanied by a copy of the applicable payment certificate which entitles *Employer* to receive payment in terms of the Contract of the sum certified;
- 4.3.2 where the Demand Amount is for the Guaranteed Sum or the full outstanding balance thereof, *Employer* shall deliver a first written demand notice to the Guarantor at the Guarantor's Address calling up this Guarantee stating that:
- 4.3.2.1 the Contract has been terminated due to the *Contractor's* default and that the Guarantee is called up in terms of this sub-paragraph. This demand shall enclose a copy of the notice of termination; or
- 4.3.2.2 a provisional sequestration or liquidation court order has been granted against the *Contractor* and that the Guarantee is called up in terms of this sub-paragraph. The demand notice shall enclose a copy of the court order.
5. Notwithstanding the reference herein to the Contract the Guarantor acknowledges that:
- 5.1 the liability of the Guarantor in terms hereof is as principal and not as surety and the Guarantor's obligation/s to make payment:
- 5.1.1 is and shall be absolute and unconditional in all circumstances; and
- 5.1.2 is not, and shall not be construed to be, accessory or collateral on any basis whatsoever;
6. *Employer* shall be entitled to arrange its affairs with the *Contractor* in any manner which it sees fit, without advising us and without affecting the Guarantor's liability under this Guarantee. This includes, without limitation, any extensions, indulgences, release or compromise granted to the *Contractor* or any variation under or to the Contract.
7. Should *Employer* cede its rights against the *Contractor* to a third party where such cession is permitted under the Contract, then *Employer* shall be entitled to cede to such third party the rights of *Employer* under this Guarantee on written notification to the Guarantor of such cession.
8. The Guarantor's obligations in terms of this Guarantee:
- 8.1 shall be restricted to the payment of money only and shall be limited to the maximum of the

Guaranteed Sum; and

8.2 shall not be discharged and compliance with any demand for payment received by the Guarantor in terms hereof shall not be delayed, by the fact that a dispute may exist between *Employer* and the *Contractor*.

9. This Guarantee:

9.1 shall expire on the Expiry Date until which time it is irrevocable;

9.2 is, save as provided for in 7 above, personal to *Employer* and is neither negotiable nor transferable;

9.3 shall be returned to the Guarantor upon the earlier of payment of the full Guaranteed Sum or expiry hereof;

9.4 shall be regarded as a liquid document for, firstly, the purpose of demonstrating and/or determining the amount due by the Guarantor to *Employer* and, secondly, obtaining any court order; and

9.5 shall be governed by and construed in accordance with the law of the Republic of South Africa and shall be subject to the jurisdiction of the Courts of the Republic of South Africa.

10. The Guarantor chooses the *domicilium citandi et executandi* for all purposes in connection with this Guarantee at the Guarantor's Address.

11.

Signed at _____

Date _____

For and behalf of the Guarantor

Guarantor Signatory 1: _____

Guarantor Signatory 2: _____

Capacity of Guarantor

Signatory 1: _____

Capacity of Guarantor

Signatory 2: _____

Witness: _____

Witness: _____

(Printed Name
of Witness) _____

(Printed Name
of Witness) _____

Guarantor's seal or stamp

PART 2: PRICING DATA

NEC 3 Engineering and Construction Contract Option A: Priced Contract with *Activity Schedule* of April 2013 (including amendments).

Document reference	Title	No of pages
C2.1	Pricing Assumptions: Option A	2
C2.2	Pricing Instructions	1
C2.3	The <i>Schedule of Activities</i>	2
C2.4	Amendments, Qualifications And Alternatives By Tenderer	1
	Total number of pages	6

C2.1 PRICING ASSUMPTIONS: OPTION A

C2.1.1 Bidders to refer to scope of work as detailed in **PART 3: SCOPE OF WORK**.

C2.1.2 How work is priced and assessed for payment

Clause 11 in NEC3 Engineering and Construction Contract (ECC3) Option A states:

- Identified and defined terms** 11
- 11.2 (20) The Activity Schedule is the *activity schedule* unless later changed in accordance with this contract.
- (22) Defined Cost is the cost of the components in the Shorter Schedule of Cost Components whether work is subcontracted or not excluding the cost of preparing quotations for compensation events.
- (27) The Price for Work Done to Date is the total of the Prices for
- each group of completed activities and
 - each completed activity which is not in a group.
- A completed activity is one which is without Defects which would either delay or be covered by immediately following work.
- (30) The Prices are the lump sum prices for each of the activities on the Activity Schedule unless later changed in accordance with this contract.

This confirms that Option A is a lump sum form of contract where the work is broken down into activities, each of which is priced by the tendering contractor as a lump sum. Only completed activities are assessed for payment at each assessment date; no part payment is made if the activity is not completed by the assessment date.

1. Function of the Activity Schedule

Clause 54.1 in Option A states: "Information in the Activity Schedule is not Works Information or Site Information". This confirms that specifications and descriptions of the work or any constraints on how it is to be done are not included in the Activity Schedule but in the Works Information. This is further confirmed by Clause 20.1 which states, "The *Contractor* Provides the Works in accordance with the Works Information". Hence the *Contractor* does **not** Provide the Works in accordance with the Activity Schedule. **The Activity Schedule is only a pricing document.**

2. Link to the programme

Clause 31.4 states that "The *Contractor* provides information which shows how each activity on the Activity Schedule relates to the operations on each programme which he submits for acceptance". **Ideally the tendering contractor will develop a high level programme first then resource each activity and thus arrive at the lump sum price for that activity both of which can be entered into the *activity schedule*.**

3. Preparing the activity schedule

Generally it is the tendering contractor who prepares the *activity schedule* by breaking down the work described within the Works Information into suitable activities which can be well defined, shown on a programme and priced as a lump sum.

The *Employer*, in his Instructions to Tenderers or in a Tender Schedule, may have listed some items that he requires the *Contractor* to include in his *activity schedule* and be priced accordingly.

It is assumed that in preparing his *activity schedule* the *Contractor*:

- Has taken account of the guidance given in the ECC3 Guidance Notes pages 19 and 20;
- Understands the function of the Activity Schedule and how work is priced and paid for;
- Is aware of the need to link the Activity Schedule to activities shown on his programme;
- Has listed and priced activities in the *activity schedule* which are inclusive of everything necessary and incidental to Providing the Works in accordance with the Works Information, as it was at the time of tender, as well as correct any Defects not caused by an *Employer's* risk;
- Has priced work he decides not to show as a separate activity within the Prices of other listed activities in order to fulfil the obligation to complete the *works* for the tendered total of the Prices.
- Understands there is no adjustment to the lump sum Activity Schedule price if the amount, or quantity, of work within that activity later turns out to be different to that which the *Contractor* estimated at time of tender. The only basis for a change to the Prices is as a result of a compensation event.

C2.2 PRICING INSTRUCTIONS

- 1 The Activity Schedule to be priced is to be drawn up by the Contractor.
- 2 The agreement is based on the NEC3 suite of documents, Option A. The additions, deletions and alterations to the NEC3 document as well as the contract specific variables are as stated in the Contract Data.
- 3 Preliminaries requirements are based on the various parts of SANS 1921, Construction and management requirements for works contracts. The additions, deletions and alterations to the various parts of SANS 1921 as well as the contract specific variables are as stated in the Specification Data in the Scope of Work.
- 4 It will be assumed that prices included in the Schedule of Activities (if any), are based on Acts, Ordinances, Regulations, By-laws, International Standards and National Standards that were published 28 days before the closing date for tenders. (Refer to www.stanza.org.za or www.iso.org for information on standards).
- 5 The Contractor is required to make designs for the works. The Contractor will assume responsibility for design for suitability for purpose for the portion of the works which he has designed.
- 6 Reference to any particular trademark, name, patent, design, type, specific origin or producer is purely to establish a standard for requirements. Products or articles of an equivalent standard may be substituted.
- 7 The Schedule of Activities is not intended for the ordering of materials. Any ordering of materials, based on the Schedule of Activities, is at the Contractor's risk.
- 8 Activity Schedule and pricing to be submitted should be at a detailed level.
- 9 No variations will be considered for any omissions by the tenderer.
- ~~10 The contract price shall remain fixed for the duration of the contract and will not change with any fluctuations in foreign exchange and CPAP.~~
- 11 CPAP shall only be applicable to works that progress to later than twelve (12) months from commencement date. Where the period is prolonged beyond the first twelve months due to the delay or non- performance by the employer, the CPAP shall be applicable; however, where the period is extended due contractor's failure to perform or delay caused by the contractor CPAP shall not be applicable. The contract value is to be adjusted using CPAP indices. The base month to be used to calculate CPAP is tender closing date. The value of the certificates issued shall be adjusted in accordance with the NEC3 Contract Price Adjustment Schedules, from the thirteenth month of the works.

C2.3 THE ACTIVITY SCHEDULE

The following activity schedule is a Guideline Activity Schedule that will be detailed further by the tenderer.

HIGH LEVEL ACTIVITY SCHEDULE (TO BE DETAILED BY CONTRACTOR)		
SUMMARY PAGE		
Description		Amount
Part 1: EPC		
	TOTAL Turnkey cost	
1.0 Sub-Total for Part 1: EPC (excl. VAT) (from page 49)		
Part 2: O&M		
	Monthly fees (total for 36 months)	
	Monthly reimbursable cost estimate (total for 36 months)	
	Once off costs	
2.0 Sub-Total for Part 2: O&M (excl. VAT) (from page 51)		
Sub Total (Part 1 + Part 2) excl. VAT		
VAT @15%		
Sub Total (Part 1 + Part 2) incl. VAT		
Contingency (client contingency 15% of Sub Total) incl. VAT		
GRAND TOTAL (To Form of Offer page 5) incl. VAT		

HIGH LEVEL ACTIVITY SCHEDULE (TO BE DETAILED BY CONTRACTOR)					
#	Activity	Unit	Qty	Rate	Amount
Part 1: EPC					
1	Detailed Design Finalisation	sum	1		
2	HAZOP study and design review	sum	1		
3	Plan submissions and approvals to construct	sum	1		
4	Signing of all interface agreements drafted by DBSA legal with input from the contractor and the MoE's	sum	1		
5	Clearing and preparation of site including decommissioning of old incinerator and diesel tanks	sum	1		
6	Tree felling, de-stumping, ground and road works for busses and waste vehicles including installation of weighbridge	sum	1		
7	Installation of perimeter fencing, access gates, signage, and establishment of onsite security	sum	1		
8	Upgrading of buildings (waste processing hall, hot water boiler and pump room, management office, digestate sheds, storage and workshop area)	sum	1		
9	Installation of rooftop Solar PV system	sum	1		
10	Installation of natural gas backup hot water boiler and heating circuits to Joburg Landfill Gas Project operated by Energy Systems	sum	1		
11	Installation of backup power supply	sum	1		
12	Installation of waste pre-processing area equipment including liquids feeding pit and associated leachate management	sum	1		
13	Construction of weighbridge office, pump room and control room buildings	sum	1		
Total Carried Forward to page 48					

HIGH LEVEL ACTIVITY SCHEDULE (TO BE DETAILED BY CONTRACTOR)

#	Activity	Unit	Qty	Rate	Amount
Total Brought Forward from page 47					
14	Construction of anaerobic digester tanks	sum	1		
15	Installation of anaerobic digester reactor fittings, mixer, heating coils, roof, insulation and cladding.	sum	1		
16	Procurement of upgrading plant	sum	1		
17	Installation of upgrading plant, compression plant, high pressure gas storage (>250 barg) and CNG filling station for the production of compressed biomethane bus fuel	sum	1		
18	Installation of dewatering systems and digestate management equipment	sum	1		
19	Supply of all required moving equipment such as; the loader for organic waste, the loader for compost, the digestate tanker. This will become the property of CoJ. Internal waste bins and skips need to be provided. Waste contractor skips and bins for moving of waste and digestate to and from site will not become CoJ property.	sum	1		
20	Furnishing of buildings including laboratory, critical spares, consumables store, workshop, offices, control room, kitchenettes, mess area, change rooms, ablutions, boardroom, meeting rooms etc.	sum	1		
21	Establishment and management of composting site with screening, watering, chipping, blending, turning and packaging capacity for processing 10-15 tons per day of digestate	sum	1		
Total Carried Forward to page 49					

HIGH LEVEL ACTIVITY SCHEDULE (TO BE DETAILED BY CONTRACTOR)

#	Activity	Unit	Qty	Rate	Amount
Total Brought Forward from page 48					
22	Establishing and management of digestate liquor utilisation schedule utilising the projects own tanker for dust suppression (while allowing for further utilisation by JCPZ and 3 rd party tankers) to transport and beneficiate a total of ~45 kL per day.	sum	1		
23	Cold commissioning	sum	1		
24	Hot commissioning incl. seeding of the digesters	sum	1		
25	Tests after completion	sum	1		
26	Handover of plant to client including as built documentation, databooks, and commissioning results and manuals (O&M phase commences)	sum	1		
27	SHEQ compliance and management (Please note that an itemised bill is required on appointment)	sum	1		
28	Forward cover for exchange rate fluctuations on imported equipment	sum	1		
1.0	Part 1: EPC – Total Carried to Summary Page (page 46) (excl. VAT)				

HIGH LEVEL ACTIVITY SCHEDULE (TO BE DETAILED BY CONTRACTOR)

#	Activity	Unit	Qty	Rate	Amount
<u>Part 2: O&M</u>					
1	Reporting and Management (36 months)	months	36		
2	Prepare and submit application for a NERSA Gas Trading License on behalf of the client and manage correspondence to this end (once off)	Sum	1		
3	Prepare and submit application (including samples and analyses) on behalf of the client to DAFF for organic fertiliser registration for liquid and solid digestate/compost fractions and manage correspondence to this end (once off)	sum	1		
4	Prepare and submit application and obtain the Small Scale Embedded Generator registration for the site (once off)	sum	1		
5	Electricity purchases from Energy Systems (36 months) – rate reimbursable based on actual	kWh	4 300 000	1.5	
6	Heating cost (36 months) – rate reimbursable based on actual	GJ	10 000	9.5	
7	Labour and staff costs (36 months)	months	36		
8	Maintenance costs (36 months)	months	36		
9	Consumable's cost including lubricants, polymer, additives etc. (36 months)	months	36		
10	Water consumption estimate (36 months)	kL		0	
11	Waste collection (36 months) – rate reimbursable based on actual	tons	54 750		
12	Waste disposal (36 months) – rate reimbursable based on actual	tons	3 000		
13	Composting of digestate (and any additional biomass required by the digestate composting process) (36 months) – rate reimbursable based on actual	tons	11 000		
Total Carried Forward to page 51					

HIGH LEVEL ACTIVITY SCHEDULE (TO BE DETAILED BY CONTRACTOR)					
#	Activity	Unit	Qty	Rate	Amount
Total Brought Forward from page 50					
14	Digestate liquid fraction management and utilisation on landfill for dust suppression (36 months) – rate reimbursable based on actual	kL	43 800		
15	Excess or alternative digestate liquid fraction management and disposal – rate reimbursable based on actual	kL	5 500		
16	Office costs, software, licenses, security, communications, bookkeeping and accounting (36 months)	months	36		
17	HSEQ management and compliance – including yearly audit (36 months)	months	36		
18	Training of CoJ (or nominated service provider) staff to operate and maintain the facility. This training will take place during the last 12 months of the operations and maintenance contract.	sum	1		
19	Statutory testing of pressure vessels and regulated equipment and components.	yearly	3		
2.0	Part 2: O&M – Total Carried to Summary Page (page 46) (excl. VAT)				

Please note: Deliverables completed per remuneration schedule will be approved by the Project Steering Committee (PSC) where after invoices will be submitted to the project manager who will process the invoice within 7 (seven) working days of receipt thereof, and remuneration will be paid within 30 (thirty) days of approved invoice.

If for whatever reason, Energy Systems, as nominated primary energy supplier, is not able to supply the waste heat or electricity, the Pikitup will make available the required electricity. Similarly, the Egoli gas startup and backup fuel cost will be a reimbursable cost from the contractor. 3rd party fuel and energy costs will not bear any markup from the contractor.

Water and electricity will be available free of charge from Pikitup but will be metered and consumption needs to be included in the monthly reporting.

The priced Schedule of Activities (to be compiled by Contractor), following hereafter will form an integral part of the "Contract" between the successful appointed Contractor and the Employer.

I, _____ of _____,
(Authorised Signatory) (Company Name)

Hereby acknowledge having read, understood and agree to requirements as set out in C2.3 and warrant that the documents submitted are true and accurate.

(Signature)

(Date)

C2.4 — AMENDMENTS, QUALIFICATIONS AND ALTERNATIVES BY TENDERER

- Use this page as a cover page to the *Amendments, Qualifications and Alternatives by Tenderer*.
- Unless otherwise stated in the tender data, amendments, qualifications and alternatives shall be recorded here.

PAGE	CLAUSE OR ITEM	PROPOSAL

I, _____ of _____,
(Authorised Signatory) (Company Name)

Hereby acknowledge having read, understood and agree to requirements as set out in C2.4 and warrant that the documents submitted are true and accurate.

(Signature) (Date)

PART 3: SCOPE OF WORK

NEC 3 Engineering and Construction Contract Option A: Priced Contract with *Activity Schedule* of April 2013 (including amendments) and **NEC 3 Term Service Contract** of April 2013 (including amendments)

Document reference	Title	No of pages
	This cover page	1
C3.1	Employers Works Information	3
C3.2	Contractors Works Information	19
C3.3	Particular Specifications	1
C3.4	Drawings	1
	Total number of pages	35

C3.1 EMPLOYERS WORKS INFORMATION

The following standards and any other relevant documentation pertaining thereto must be studied and all principles in this regard must be applied to all procurement documentation, practices and procedures.

Area	Reference
Product /Construction standard(s)	ASME VIII / AWS D1.1 / EN 13445 / PD 5500 / EN 12952 / EN 12953 / ASME B31.1 / ASME1 / ASME B31.3 / BS 2633 / SABS 347:2012
Alternative Standard(s) (Refer to ISO 3834-5, clause 2.1b)	BS EN 13480
Welding Process(es) (ISO 4063) ISO 3834-2	MMA (111) / SAW (121) / MIG/MAG (131/135) / FCAW (136) / TIG (141) Quality requirements for Fusion Welding of Metallic Materials
Parent Material Group(s) (ISO/TR 15608)	1 / 2 / 3 / 4 & 6 / 5 / 7 & 8 / 9 / 11
Mechanical Works for Steel Structures	BS EN 10149-2 / EN 10149-2 – Hot-rolled flat products made of high yield strength steels for cold forming
Mechanical Works for Steel Structures	BSEN 101421 EN 10142 – Specification for continuously hot-dip zinc coated low carbon steel sheet and strip for cold forming: technical delivery conditions
Mechanical Works for Steel Structures	BSEN 10147 / EN 10147 – Continuously hot-dip zinc coated structural steels strip and sheet
Mechanical Works for Steel Structures	BSEN 10327 / EN 10326 – Continuously hot-dip coated strip and sheet of structural steels. Technical delivery conditions
Mechanical Works for Steel Structures	EN 10346 – Continuously hot-dip coated steel flat products. Technical delivery conditions
Mechanical Works for Steel Structures	ISO 1090-2 – Steel structures and aluminium structures - Requirements for execution of steel structures
Mechanical Works for Steel Structures	ISO 1460 – Metallic coatings - Hot dip galvanized coatings on ferrous materials - Gravimetric determination of the mass per unit area
Mechanical Works for Steel Structures	SANS 32 / EN 10240 – Internal and/or external protective coatings for steel tubes - Specification for hot dip galvanized
Mechanical Works for Steel Structures	SANS121 / ISO 1461 – Hot dip galvanized coatings on fabricated iron and steel articles - Specifications and test methods

Area	Reference
Mechanical Works for Steel Structures	SANS12944 / EN ISO 12944 – Paints and varnishes. Corrosion protection of steel structures by protective paint systems
Mechanical Works for Steel Structures	SANS14713 / ISO 14713 – Protection against corrosion of iron and steel in structures - Zinc and aluminium coatings – Guidelines
Mechanical Works for Steel Structures	SANS50025-2 / EN 10025-2 – Hot-rolled products of non-alloy structural steels - Part 2: Technical delivery conditions for non-alloy structural steels
Bolts, nuts and screws	ISO 3505-1/ EN ISO 3506-1 – Mechanical properties of corrosion-resistant stainless-steel fasteners. Bolts, screws and studs
Bolts, nuts and screws	ISO 3506-2 / EN ISO 3506-2 – Mechanical properties of corrosion-resistant stainless-steel fasteners. Nuts
Bolts, nuts and screws	ISO898-1 – Mechanical properties of fasteners made of carbon steel and alloy steel. Bolts, screws and studs with specified property classes. Coarse thread and fine pitch thread
Bolts, nuts and screws	SANS 14399 / EN 14399 – High-strength structural bolting assemblies for preloading
Design and static dimensioning	SANS10160 – Basis of structural design and action for buildings and industrial standards
Design and static dimensioning	SANS10162-1 – The structural use of steel Part 1: Limit states design of hot-rolled steelwork
Design and static dimensioning	SANS 10162-2 – The structural use of steel Part 2: Limit states design of cold- formed steelwork
Design and static dimensioning	SANS 10162-3 – Basis of structural design and actions for buildings and industrial structures Part 3: Wind Actions
Design and static dimensioning	SANS 10400 I BS 8118 – 1991 – Code of Practice - The Application of the National Building Regulations
Lightning Protection	SANS 10200:1985.
Lightning Protection	SANS 61024 – Protection of structures against lightning.
Lightning Protection	SANS 62305 – Earthing and Lightning Protection.
Lightning Protection	SANS 10313:2008 Protection against lightning - Physical damage to structures and life Hazard.
Earthing and Grounding	SANS 10292:2001

Area	Reference
Civil Works	SANS 1200 – Standardised Specification for Civil Engineering Construction
Control and Monitoring System	R842: Government Gazette, 8 August 2008
Quality	SANS 9001/150 9001 – Quality Management Standard
Quality	Standard for Quality Management Systems (ISO) 9001:2015
Environmental	National Environmental Management Act No 107 of 2008 (NEMA)
Safety	Occupational Health and Safety Act, Act Nr 85 of 1993 including the following Regulations:
Safety	Pressure Equipment Regulations, 2009
Safety	Major Hazard Installation Regulations, 2001
Pressurized equipment	SANS 347:2012 Categorization and conformity assessment criteria for all pressure equipment.
Compressed Natural Gas	SANS 208: The design and installation of compressed natural gas (CNG) vehicle filling stations;
Natural gas	SANS 827: The installation of pipes and appliances for use with natural gas;
Hazardous Areas	SANS 10108: Hazardous Areas classifications;
Combustion	SANS 329: Industrial thermo processing equipment (Safety requirements for combustion and fuel-handling systems)
Gas piping	SANS 4437: Buried polyethylene (PE) pipes for the supply of gaseous fuels - Metric series – Specifications.
Explosion protection	ARP 0108:2005: Regulatory requirements for explosion protected apparatus
Health	National Norms and Standards relating to Environmental Health in terms of National Health Act, 2003 (Act Nr 61 of 2003)
Chemicals	SANS 10234: Global Harmonized System of Classification and labelling of chemicals.
General	Preferential Procurement Policy Framework Act, 2000: Preferential Procurement Regulations, 2017.

C3.2 CONTRACTORS WORKS INFORMATION

1 DESCRIPTION OF THE WORKS

1.1 Background

The Development Bank of Southern Africa (DBSA) entered a partnership and concluded a Memorandum of Agreement (MoA) with the City of Johannesburg and University of Johannesburg in June 2018. The aim of this MoA is to carry out the full implementing agent role for contracting and managing the design, construction, installation, commissioning, and subsequent operations and maintenance of the CoJ Biodigester Plant on behalf of the City of Johannesburg.

The amount of waste which is being generated in the City of Joburg (CoJ) continues to escalate due to significant growth, both in population as well as in the average income of the Gauteng residents. At this point in time, existing landfills are running out of airspace at a rapid rate and the development of new landfill sites is difficult because there is a scarcity of suitable land within the jurisdiction of the CoJ. By far the largest landfill in the CoJ jurisdiction is Robinson Deep Landfill operated by PIKITUP.

A large portion of this waste is biodegradable as it is organic in nature. A feasibility study done by University of Johannesburg (UJ) in 2011 showed that some of waste streams within the city lend themselves to separation at source and can easily produce a clean organic waste stream that can be utilized in an anaerobic digestion process to produce biogas. It was established that the Johannesburg Fresh Produce Market (JFPM) is such a producer of relatively clean (>95%) organic waste and typically generates on average more than 50 tons per day. In 2018 the design and development for such a biogas facility was initiated with the initial target processing capacity to be less than the threshold amount required for a full Environmental Impact Assessment (EIA), but adequate for a sizeable commercial scale demonstration plant. Potential uses for the biogas considered initially during the feasibility stage where: production of heat, production of electricity, and/or production of biomethane. The use of waste heat and other renewable sources for integrated power use was also investigated and incorporated.

The use of biogas as bus fuel through upgrading of the biogas was selected as the most ideal methodology to utilize the biogas in CoJ owned Metrobus busses. This compressed biomethane fuel is essentially equivalent to Compressed Natural Gas (CNG) and will offset expensive and polluting diesel in the CNG capable Metrobus fleet (Annexure D: CNG Specification).

The old incinerator facility located at the Robinson Deep landfill was selected as the project site. The site is also shared with other users such as the Joburg Landfill Gas Project (operated by Energy Systems) that generates electricity from landfill gas, and Pikitup that operate the landfill and that have offices outside the project site boundary. This site has existing (yet aged) infrastructure that will be repurposed for the CoJ Biomethane project. The project site will be cordoned off separately. The contractor will be required to refurbish some of the buildings while building some new ones, demolishing others, and removing certain equipment, structures, trees and waste from site.

1.2 Employers Objectives

The employer seeks to achieve the following objectives with the project:

1. Divert organic waste from landfill.
2. Establish a world class waste to energy recovery demonstration plant.

3. Enable training of CoJ staff and UJ students in waste to energy technology.
4. Enable data collection on performance of biomethane production from organic waste within the city that would be usable in scaling up in the future.
5. Train their staff and employees to manage, operate and maintain the facility.
6. Maximize the use of underutilized infrastructure within the city.
7. Supply a renewable alternative to CNG fuel from biogas for fueling some of the CNG fuel capable DDF busses.
8. Registering with NERSA as a gas source and obtaining a trading license for future CNG sales.
9. Beneficiate the residual digestate to useful compost within the city operations and as a registered compost product for future sales.
10. Maximize synergies between the existing Joburg Landfill Gas project and the new CoJ Biomethane plant to recover waste heat, electricity, and biogas.

1.3 Functionality

The functional description corresponds with the Process Description for the envisaged plant and any deviations from the foreseen concept design must be highlighted in the Technical Offer and motivated.

FEEDSTOCK PROCESSING

The contractor will establish on site waste management presence at the JFPM to ensure high purity organic waste is separated from contaminants to a reasonable level to enable better processing at the biomethane plant. Waste will be collected daily to minimise odours from rotting waste at JFPM. The exact feedstock composition varies with seasons as different produce (fruits and vegetables) is available from the JFPM at different times. BMP tests were done in the Feasibility Study by the University of Johannesburg (see Annexure O), which deals with JFPM waste source from page 30 onwards. This is expected to be >96% fruits and vegetables by weight. Also, pictures of the waste are included in the Feasibility Study. Waste contamination is typically light packaging made of netting, cardboard bags, cardboard boxes, wooden crates, cellophane wrapping, polystyrene trays, and other light packaging.

For the organic wastes from the fresh produce market, no grit separation is needed as after de-packaging it is all clean organic waste which will be pulped thoroughly to <5 mm particle size before blending and feeding to the digester. Spatial allowance for de-gritting equipment and de-packaging equipment for future expansion should be allowed for.

As waste will be present and combustible packaging waste will be stored in a reject waste bin, a fire detection and suppression system is required inside the main processing building.

WASTE HANDLING

Waste is to be collected daily from JFPM in bins and disposed of in the waste receiving and processing hall. A small (preferably CNG fuelled) loader moves material around the tipping floor and loads the process hopper.

The waste feedstock is then processed manually and mechanically to feed it into the digesters. This includes waste sorting to remove any contaminants manually from a picking belt before pulping, grinding, blending, and pumping to a buffer tank. Due to the high moisture content of the organic waste, leachate will develop on the tipping floor. It is important to keep waste disposal vehicle tyres clear of

this leachate and to reticulate runoff inside the hall to a point where it can be easily washed off, collected and added into the digester feed.

The residual sludge, called digestate, after anaerobic digestion process will be processed into both a liquid and solid fraction that are high in organic nutrients and have a nutrient value for use in offsetting chemical fertilizer, irrigation water and compost use.

Packaging and other general waste rejects will be dropped in bins that are consolidated into larger skips for disposal to landfill once a day. Waste processing area cleanliness is a high priority to reduce the development of odours and attracting vermin. Excess waste generated by JFPM should be diverted from the plant and may be disposed of at Robinson Deep landfill or at a suitable alternative disposal facility but only if the cost to the city will be less than when disposing at Robinson Deep.

LOGISTICS

Logistics of waste management and materials transport is key in this tender as CoJ is seeking to appoint a contractor to build a facility to treat the waste, convert it to biogas and compost, and produce a biomethane bus fuel. The project includes the entire management, operation and maintenance of this demonstration facility for a period of 3 years. The contractor will take over the JFPM waste removal responsibility from Pikitup, and therefore will need to have access to waste management services and trucks for the 3-year period of the operations and maintenance contract. As the waste generated by JFPM is not 100% organic and not exactly sized to the fixed throughput capacity of the envisaged demonstration plant, some waste will be diverted, or rejected from the plant.

The contractor will be responsible for all the general waste and therefore manage the following:

1. The onsite waste management at JFPM (minimisation of unnecessary contamination of organics).
2. The collection and transport to the CoJ Biomethane plant or Robinson Deep landfill
3. The pre-processing and buffering of the feedstock to the facility
4. The diversion or disposal of rejected, residual and excess waste to Robinson Deep landfill.

The contractor will also be responsible for the following related logistics activities:

1. Spreading the digestate liquid fraction on the landfill as dust suppression using a tanker similar to that which is currently used for dust suppression
2. Moving the digestate cake from the CoJ Biomethane plant to the composting facility at the Joburg Metro Police Department (JMPD) Academy site next door for maturation into compost.

The contractor will be responsible for maturing the solid digestate portion produced daily by the biogas plant. This will require blending with horse-manure (from JMPD onsite) and chipped green waste. The green waste will be supplied and delivered by Joburg City Parks and Zoo (JCPZ) and/or Pikitup as required by the contractor. The contractor will chip the required green waste material with a diesel or electric chipper to blend it in with the digestate using a front-end loader. The contractor may also recycle dry mature digestate into fresh digestate piles to reduce fresh green material use. After composting is complete and mature, the compost will be loaded into a screening plant that feeds into a bagging unit (30 dm³ LDPE). The number of bags produced will be agreed monthly between CoJ EISD Social Development and JCPZ. Bags will be supplied by the relevant CoJ entity. Alternatively, compost will be stockpiled in bulk and collected by 3rd parties in bulk. Residual waste from this site as well as digestible manures from the kennels will be collected by the contractor to add to the biogas plant feedstock (after

contaminants are removed). Electricity will be supplied at the composting site by CoJ (JMPD). Compost process water should be sourced from the biogas plant (liquid digestate fraction) by the contractor.

BIOGAS AND BIOMETHANE PRODUCTION

The plant size is a nominal 50 tons of clean organic waste per day. Biogas is produced by microbial degradation of putrescible organic waste in a process called Anaerobic Digestion (AD). The process employed in this project is mesophilic anaerobic digestion with two insulated and clad Continuously Stirred Tank Reactors in series. The temperature will be controlled at 38°C to 40°C. It requires careful feed preparation and control in large tanks called digesters. Even though the nominal phase 1 design capacity is 50 ton per day of organic waste from the JFPM, the variability of waste from JFPM can range from 10 to 150 tons per day of waste (see attached Annexure E: JFPM Waste Data). The contractor should therefore allow for a waste buffer in a feed buffer tank and/or in bins and the waste reception area considering the raw waste storage limitations of the Environmental Authorisation. Spatial allowance for expansion to 100 tons per day should be kept in mind wherever possible.

Digester heights aren't limited, but ground stability and planning approval impacts should be considered when going over the height of the existing building. The major height limitations are minimum heights in the waste receiving and processing building where hooklift, REL and FEL compactors need to discharge. The contractor needs to ensure that this is suitable for all 3 types especially the types of vehicles they will be contracting to collect the waste. The digesters have no height limitation but should keep in mind height to diameter.

Pasteurisation is not currently included and only a future add-on the city may consider in subsequent expansions when the feedstock composition may change to include animal by-products.

An equivalent gas to natural gas can be obtained by purifying and upgrading biogas, which is typically 60 vol.% methane (CH₄) and 40 vol.% carbon dioxide (CO₂). The removal of CO₂ and other impurities leads to an increase in the CH₄ concentration to above 95 vol.% with an associated calorific value (CV) increase. This upgraded gas is called biomethane. It is odourised (a Mercaptan stench added to help identify leaks) and compressed to high pressures to obtain energy densities that allow it to be used as fuel. In this project the gas will be compressed and filled into cylinders which act as fuel tanks on the Metrobus busses. Currently the CoJ has approximately 148 diesel dual fuel (DDF) busses in their Metrobus fleet that can utilise this renewable fuel. It is foreseen that this project can fill approximately 10-30 busses per day with this compressed natural gas (CNG) equivalent, called compressed biomethane (CBM). The biogas filling station will allow for NGV 1 and NGV 2 connections with two bays next to each other and will have card readers to identify busses and drivers that fill up and how much they fill up (see attached Annexure F: Concept Design Layout). This data shall be recorded on the SCADA and data repository.

The contractor will manage the daily waste processing, biogas production, and biomethane production through upgrading. The upgraded biomethane will be compressed into high pressure storage for filling selected Metrobus busses on a set schedule. The contractor should enable the bus drivers to fill their tanks within 10 min of connection to the dispensers.

BUILDINGS AND STRUCTURES

The following buildings are envisaged for the project:

- Weighbridge office: New building
- Management building: Existing but to be refurbished.

- Main processing building: Existing but to be refurbished. Incinerator to be decommissioned and removed with all its parts.
- Hot water boiler building: Existing building on top of which the incinerator flue gas treatment is located. To be refurbished.
- Control room: New building directly adjacent to the current Main processing building where the old wash bay and incinerator ash removal was located.
- Digestate dewatering: Existing shed next to main processing building to be refurbished
- Pump room: New (next to or in between digesters)
- Storage shed: Existing shed next to main processing building to Digestate Dewatering building
- Small storage room: Existing shed next to the Storage shed

The contractor may suggest to utilise the buildings differently if they can provide adequate motivation.

The project site is an old incinerator facility. Here the old waste receiving warehouse of the incinerator will be used for receiving and processing the organic waste. Certain upgrades to the structures are required and these will be included in the EPC scope (Annexure G: Concept Structural Report).

Incoming and outgoing waste from the project will be weighed by a newly built weighbridge for the biomethane plant. Waste that bypasses the plant will require a waybill from the Robinson Deep landfill weighbridge (separate).

Lightning protection rods and earthing will need to be installed to prevent lightning damage as per a certified engineers design.

The following tanks are envisaged:

- Fire water tanks
- Rainwater capturing tanks
- Feed buffer tank
- Digesters 1 & 2
- Digestate liquid tank

DEMOLITION AND LANDSCAPING

The following structures need to be demolished and removed:

- Old wash bay
- Old inground diesel tanks
- Steel structure behind Storage and Digestate Sheds.
- Old weighbridge
- Internal walls of the main processing building (old incinerator building)
- North facing wall of the main processing building
- Removal of the old incinerator plant, flue gas treatment, and ash removal
- Internal prefabricated concrete panel walls within the new site boundary

The incinerator and flue gas treatment unit may contain residual ash which may need safe disposal. No residual bulk chemicals were identified on site. All non-hazardous waste removed from the site can be disposed at the adjacent landfill (excluding scrap metal). Additionally, the contractor may dispose of the scrap metal as they see fit.

There are two subterraneous diesel tanks that need to be decommissioned, excavated and removed.

Several large Eucalyptus trees are on site. Several of these will need to be removed and de-stumped. The contractor is encouraged to leave trees where possible, taking into account the possible impacts of branches falling and roots impacting new and old infrastructure. The main tree felling requirement is foreseen at the new weighbridge office and parking immediately south of the main processing building.

PIPING AND RETICULATION

- a. Hot water pipes will be corrosion treated, insulated and clad.
- b. Waste and digestate slurry piping will be either stainless steel, or HDPE.
- c. The biogas and biomethane pipeline material of construction can be suitably graded HDPE if submerged underground or Stainless Steel if mounted above ground.
- d. Pipes and cables can be routed underground in a covered culvert or above ground on a pipe/cable rack or both. Danger tape should be installed for gas pipes and electrical reticulation
- e. Gas and Electricity reticulation should be adequately separated.
- f. Care should be taken for thermal expansion of hot water piping and for condensate formation in the biogas line. Condensate traps or an angled installation should be considered (min 2 deg).
- g. The electricity will be supplied from both the Energy Systems Landfill gas project and the existing sub-station. The fallback supply is the supply from City Power via the existing substation. The renewable energy supply from Energy Systems is an add on feature to save electricity costs for the site as a whole and will be integrated and synchronized to the supply from City Power. In some instances, the site may therefore export power while at other times it may be importing electricity. For this reason, the SSEG compliant installation and registration is required.

ROADS AND PAVEMENT

Roads will allow for load bearing vehicles such as busses and waste dump trucks. Non-load bearing pavement will be interlocking bricks with suitable curbs. The storm water runoff should be taken into account when setting out walkways, pathways, pavements and roads. The site slopes toward the leachate pond and the lowest point of the site at the edge of the pond shall have an attenuation system that caters for the flows from the site as well as storm water from the rest of the site that is diverted through this facility.

INSTRUMENTATION AND CONTROL

The contractor will need to report on process parameters of the biogas plant on a monthly basis based on recorded data. In addition to this a daily mass balance needs to be calculated taken into account material flows coming into and out of the facility. For this reason, adequate instrumentation and control should be allowed for. This should be recorded on a data repository on a local server that is backed up on the cloud.

CCTV cameras will also record to this server for a period of up to 1 week.

The CCTV cameras will be displayed in the control room on a large screen. As a minimum the following will be monitored:

- Biomethane filling points (so that bus number plates can be identified).
- Waste processing hall internal.
- Weighbridge outward and inward facing.
- Gates.
- Management office entrance.
- Control building entrance.
- Main processing building entrance.

The Distributed Management Systems of all sub sections will report to a main PLC in the control room linked to a SCADA system for the entire facility. The SCADA system display will be on 3 large screens in the control room. At a minimum, the following process data will be recorded and stored and will be made available remotely on request by the client:

#	Parameter	Location/Source
1	Daily and weekly feedstock and digestate analyses	Manually entered
2	Online biogas analyser outputs	SCADA
3	Online biomethane analyser outputs	SCADA
4	Gas sample analyses	Manually entered
5	Digester temperatures	SCADA
6	Process temperatures and pressures	SCADA
7	Tank levels	SCADA
8	Weighbridge data (in and out)	Manual or automated
9	Flow meter data	SCADA
10	Bus identification, driver information, filling timestamps and quantity data	SCADA
11	Valve positions, motor and switch status	SCADA
12	Electricity consumption (Pikitup site, export from site, Solar PV production, Biomethane plant consumption, power from Energy Systems)	SCADA
13	Water consumption and effluent production	SCADA

This data will also form part of the monthly report to ensure production targets are met.

BATTERY LIMITS

- a. Pikitup: Pikitup are the site custodians and operators of the landfill. The electricity and water supply to the plant will be through existing Pikitup
- b. JFPM: Joburg Fresh Produce Market is the waste supplier and generator. Their current waste bin storage area is where the contractor will monitor the waste disposal and manage separation at source before it is transported off site. JFPM will be dependent on this contractor to remove all their waste for the duration of the contract.
- c. JCPZ: Johannesburg City Parks and Zoo will avail green waste for composting with digestate and will be the main off-taker for the compost.
- d. EISD Social Development: Social Development will be off-taking compost for inner city farming projects.

- e. JMPD: Joburg Metro Police Department will allow the composting of digestate on their property.
- f. Metrobus: Metrobus is the off-taker of the biomethane from the plant.
- g. City Power: The site electrical supply entity with which the SSEG registration and connection should be concluded with.
- h. Egoli Gas: Natural gas supply on site. The contractor will need to open a new account and get the connection recommissioned.
- i. Energy Systems: Energy Systems operate the Joburg Landfill Gas project. They are operating 3 large 1 MWe gensets. Substantial heat is available from this plant and they have agreed to sell heat and electricity from this plant at a discount to the CoJ biomethane project. The interfaces are:
 - Heat supply to the digester project by allowing the contractor to tie into the genset cooling water system by inserting a running and standby plate frame heat exchanger. The contractor will pump water through the heat exchanger in a closed loop from the digesters to the landfill gas generator location (where the plate frame heat exchanger is to be located).
 - Any clean biogas (post desulphurisation) can be vented to the inlet of the landfill gas project (in case the upgrading plant is not running).
 - Energy systems will produce a maximum of 170 kWe of electricity from waste heat and will make this available to the project. This needs to be reticulated from the new infrastructure which Energy Systems is to build, in parallel to the construction of the CoJ Biomethane plant, to the substation and connected as described in (f) above.
 - Energy Systems will take the biogas for free (however this vented gas quantity should be measured by the contractor for reporting). The heat will be sold to the project for R9.5/GJ and the electricity for R1.5/kWh (these are reimbursable rates under the contract but will be paid by the contractor to Energy Systems and reimbursed by CoJ). Draft offtake agreements have been compiled.

UTILITIES AND SERVICES

The site has access to the following external services:

- Sewer
- Potable Water supply (from Joburg Water via Pikitup connection)
- Electrical supply (from Joburg Water via Pikitup connection)
- Natural gas (Egoli Gas)
- Road access through the main entrance managed by PIKITUP for Robinson Deep Landfill on to an intersection with Turffontein road and Marlborough Road with a traffic light.

The site will have the potential to generate electricity from Solar PV embedded on the north facing side of the main waste processing building. In addition to this, electricity may be supplied to the project from Energy Systems (by them implementing an add-on electricity generation unit utilising waste heat). This electricity will need to be brought into a panel in the LV side of the substation and metered. The SSEG guidelines for the City of Johannesburg are herewith attached. The waste heat to energy system is also inverter based and will therefore be applied for using this same process (even through the documentation refers to PV). See Annexures P & Q.

Renewable energies for on-site power generation from solar and waste heat are therefore incorporated to limit the infrastructure requirements from Pikitup and City Power. Excess power generated from site will be evacuated from the connection point absorbed by the city. The site includes a natural gas supply for a backup power generator, alternative gas supply to the CNG filling station, and a backup hot water boiler.

The project further entails waste heat utilization from the neighbouring Joburg Landfill Gas project for heating the digesters

Waste heat utilization is extensively envisaged in this project and enabled by Energy Systems installing infrastructure to accommodate this. Excess or unused clean biogas is vented to the Joburg Landfill Gas Project to ensure utilisation in generating electricity. If this outlet is not available or if there is a critical process fault, the biogas is sent to an emergency flare.

The plant will be a net consumer of electricity as the energy from the biogas is produced in the form of vehicle fuel. However, it is envisaged that the property will be an exporter of renewable energy to City Power (the CoJ electrical company). This renewable energy will come from rooftop solar and 3rd party waste heat recovered electricity from Energy Systems. A solar rooftop power generation will be incorporated into the project and approximately 20 kWp grid connected photovoltaic power generation is possible on the raised and upgraded north facing main warehouse roof.

DIGESTATE HANDLING AND COMPOSTING

The solid digestate is matured as compost to be used by the Johannesburg City Parks and Zoo (JCPZ). This compost is to be registered by the Contractor as a Group 2 organic fertilizer during the operations of the plant. In addition to this the Social Development department of the City of Johannesburg will take approximately 100 tons per month of compost for their small inner city farming projects. The composting of digestate may require a portion of garden refuse to enable proper aeration of windrows or alternatively the recycling of matured compost with fresh digestate solid digestate. The site earmarked by the CoJ for this is a large unused warehouse on the Johannesburg Metropolitan Police Department (JMPD) Academy that borders the biogas plant site.

Possibilities for the utilisation of the digestate liquid fraction are, amongst others, dust suppression on the landfill, irrigation with tankers by JCPZ and others for nutrient beneficiation in gardens and farms and to offset potable and irrigation water use in these applications. The contractor will be responsible for finding suitable uses for this on a continual basis.

GENERAL

This project is a pilot project to demonstrate the CoJ's ability to implement and operate such a project. Scaleup and replication of such systems is crucial for the sustainability of the City.

Spatial allowance needs to be made for expansion of the facility up to 100 tons of waste per day. Some allowances are indicated in the concept layout design.

The project will require the construction and revamp of specific infrastructure for the successful long-term operations of the plant in a demarcated area. A 3D model representation of the envisaged facility and the demarcated area is given in Annexure H.

The facility will operate as a commercial demonstration plant and access to field visits from Schools, Universities and interest groups should be allowed for in the week during working hours upon scheduling and booking with the operations team. A maximum group size of 20 is suggested.

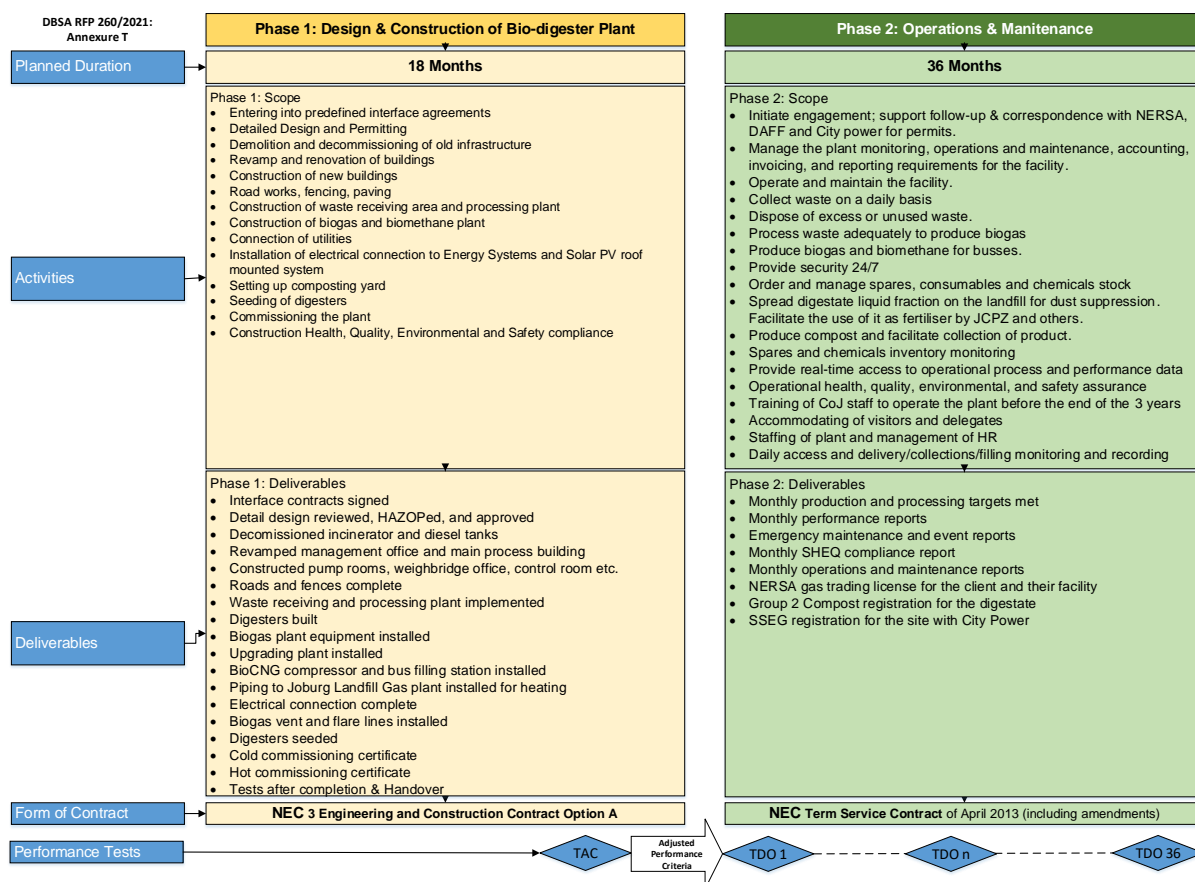
1.4. Project Contracting and Phasing

The project will be broken down into the following two components:

PART1: Engineering Procurement and Construction (EPC) of the waste processing and biomethane production facility including waste collection, pre-sorting, bus filling station and residual disposal equipment.

PART 2: Operations and Maintenance (O&M) of the waste processing and biomethane production facility including waste collection, pre-sorting and residual disposal on behalf of CoJ for 3 years following the completion of the commissioning and handover of the plant. The contractor will manage the facility on a day-to-day basis and report to the client monthly. During this first O&M period it is essential that the contractor concludes additional licenses for CoJ. Bidders are expected to do research into what licenses would be required, to research the NERSA Gas trading license process, the Group 2 Fertiliser registration process and the Small-Scale Embedded Generator registration for the site to export excess power.

Figure 1 below sets out the contracting structure and phases for the project (See Annexure: T)



Considerations of sustainable building practices such as rainwater harvesting, water conservation and reuse, and integrated rooftop solar PV are required.

As part of a turnkey solution the contractors will gather their own professional teams for the execution of the projects in accordance with the DBSA SCM policies, and Preferential Procurement Policy Framework Act Regulations No. R32 published in Government Gazette 40553 on 20 January 2017 and effective from 1 April 2017 (PPPFA Regulations 2017).

In this section C3.2 the term *Client* shall have the meaning ascribed to the term Employer in terms of this NEC3 ECC Option A Agreement,

The DBSA as an Implementing Agent will do the following for the remaining period of the contract:

- A. Procure, appoint, and manage the Contractor,
- B. Facilitate the briefing session,
- C. Evaluate bids and make recommendations,
- D. Manage and supervise the works by the Contractor during implementation
- E. Do safety, health, environment, and quality audits and liaise with the CoJ for handover of the Biodigester Plant,
- F. Conduct regular meetings with the Contractor
- G. Report at regular meetings held by CoJ
- H. Oversee execution of the works
- I. Conduct site, practical, works and final completion inspections
- J. Continuous engagement with relevant stakeholders
- K. Close projects

1.5 General Functional Specifications

The plant should, be designed, constructed, and operated to perform as a minimum, to the following guaranteed performance criteria:

1. Minimum **on-specification** Bio-CNG produced per week - 450 GJ/week based on LHV.
2. Minimum weekly organic waste processing - 350 tons/week.
3. Maximum moisture content of digestate solids - <77%.
4. Maximum solids concentration in digestate liquid - <2%.
5. Maximum moisture in compost product - <40%.
6. Minimum availability of Biomethane plant – 95%

The guaranteed performance criteria for both contracts is the same accept if adjusted subsequent to Tests After Completion (TAC) for Contract 1 after Low performance Damages have been settled.

The actual performance will be linked to a equally weighted value between the 6 parameters listed above, each parameter linked to the % of the actual performance relative to guaranteed performance.

For Contract 1: NEC 3 ECC Option A for the EPC of the plant.

These performance criteria will be tested according to the Tests After Completion (Annexure V)

For Contract 2: NEC Term Service Agreement for Plant Operations and Maintenance.

The monthly report will serve as the monthly test whereby underperformance regarding the functional specifications will be penalized on the same scale as set out in the Tests During Operation (TDO Annexure W). Unavailability of gas offtake and of waste availability is the responsibility of the employer and the contractor will not be penalized for this. For monthly payment certificates the relevant low performance damages will be subtracted if applicable.

If the Employer is responsible for unavailability, no-feedstock, no CNG off-takers, or other interruptions, these impacts will be excluded from the calculations of Low Performance damages and the performance of the contractor and plant will be adjusted.

1.6 Scope of Works (SOW)

The Scope of Works will involve, but is not limited to the following work elements:

- Part 1- EPC
 - a. Detailed design finalization based on review of concept design (provided).
 - b. HAZOP and design review with client.
 - c. Issuing of final health and safety specification to the professionals, early works specialist and the principal contractor and submission of health and safety plans thereof.
 - d. Application for construction work permit (Department of Employment and Labour)
 - e. Compilation and submission of contractors final site plans for Site Development Plan approval and Building Plan approval as well as Fire chief signoff.
 - f. Provide all relevant signoffs for gas, pressure, civil, structural, and electrical system designs.
 - g. Signing of offtake, supply agreements or technical operational interface memos with identified Municipal Owned Entities listed below. DBSA has engaged with these entities and will facilitate engagement as well as do all the legal drafting of the required contracts. The successful EPC contractor will be provided with draft contracts for review in order to finalise these contractual arrangements.
 - i. Metrobus – for Biomethane offtake into busses.
 - ii. PIKITUP – for access to utilities, site, landfilling of residues, water for dust suppression.
 - iii. Johannesburg Fresh Produce Market (JFPM) – for supply of waste.
 - iv. Johannesburg City Parks and Zoo (JCPZ) – for digestate utilization.
 - v. CoJ Social Development – for digestate utilization.
 - vi. Energy Systems – for heat supply, renewable electricity supply and biogas return.
 - vii. Johannesburg Metro Police Department (JMPD) – waste disposal from the neighboring academy (horse and dog manure) and the utilization of their site for digestate maturation and compost storage/packaging.
 - h. Submission of Major Hazardous Installation Assessment Report to the Department of Employment and Labour.
 - i. Decommissioning and removal of the old defunct Health Care Risk Waste Incinerator that is onsite.

- j. Removal of old in ground diesel tanks (2 off).
- k. Removal of rubble and waste from site.
- l. Removal of old weighbridge and parts.
- m. Renovation and height increase of waste processing building to allow for tipping of waste vehicles.
- n. Removal of lean-to structures to the waste processing building.
- o. Removal and de-stumping of trees.
- p. Renovation of parking area pavement and allow for parking of a suitable number of Roro bins for excess waste storage during waste supply surges.
- q. Renovation of old Driver Training Center to become management offices to include the following.
 - i. Reception (in corridor)
 - ii. Office for two desks
 - iii. Boardroom (min 20 seater)
 - iv. Infirmary
 - v. Ablutions (male and female)
 - vi. Kitchenette
 - vii. Server, filing and storage room (refer to Annexure R)
- r. Removal of south facing prefab concrete wall.
- s. Supply and installation of security perimeter fencing and gates as required for access for busses, waste management vehicles, pedestrians, and staff vehicles.
- t. Supply and Install a new weighbridge for waste management vehicles (Rear End Loaders, Front End Loaders, and up to 30m³ Hooklift Roro Skip trucks).
- u. Construction of access roads for buses as per own detailed design based on concept layout.
- v. Repaving in select areas where trucks are to articulate as per own detailed design based on concept layout.
- w. Construction and furnishing of weighbridge office with office looking out on weighbridge, induction room and both internally and externally accessible ablutions for security and staff.
- x. Construction of new double story annexure to waste the processing building for control room, ablutions, washrooms, laboratory, and mess area.
- y. Furnish a laboratory with suitable analytical equipment for biogas plant operation and sample management.
- z. Upgrade the onsite substation to allow for:
 - i. Improved access and storm water runoff and prevention of flooding.
 - ii. Certification of existing electrical panels, with add-ons for new plant tie-in.
 - iii. Connection to the Energy Systems waste heat to electricity connection.
 - iv. Ensure an electrical connection is established through which electricity can be exported from site while ensuring compliance with national and local regulations (including Small Scale Embedded Generator regulations)
 - v. Supply and installation of electricity metering for usage control. This means, measuring power produced by Energy Systems's waste heat to energy plant, power consumed by

the Biogas project, power consumed by the rest of the Pikitup site as a whole, power generated by the rooftop Solar PV plant and power exported from site.

- aa. Supply and install a biogas vent line from the biogas plant (post desulphurization and dehumidification) for diversion of biogas to the Joburg Landfill Gas project inlet.
- bb. Supply and install hot water reticulation and a duty and standby hot water plate-frame heat exchanger at the Joburg Landfill Gas CHP's, connecting at-least two units to allow for switchover when maintenance is done on a CHP or heat exchanger. Hot water flow and temperature metering for billing is essential.
- cc. Supply and install an emergency flare.
- dd. Supply and install a backup hot water boiler and connect the same to the Egoli gas network.
- ee. Supply and install a backup generator and connect the same to the Egoli gas network or alternatively a diesel backup generator (for critical loads only).
- ff. Put up signage for project including; project name, names and logos of all parties involved with the project implementation, directions for vehicles, statutory health and safety signage.
- gg. Supply and install 3 off automatically fast opening polymer roller doors (suitable for odour control) of adequate size to allow the reversing of waste management vehicles and for them to discharge on the waste processing building floor.
- hh. Provide a suitable loader vehicle to function in the limited space on the inside of the waste processing building to pick up waste and to discharge into the feed hopper of the picking line. Preferably a CNG fueled loader or skidsteer.
- ii. Construct suitable channels and slopes for managing leachate on the waste processing floor building and collect it for addition to the biogas plant feed system. It is essential that the leachate be washed off periodically to prevent odors.
- jj. Supply and install a liquids and sludge receiving pit (with lid) in the waste processing building to discharge to the macerator and into the buffer tank, care should be taken for removal of debris and contaminants from the pit. The pit should allow for vehicle discharge of up to 20 m³ by tipping motion without spillage.
- kk. Supply and install an odor management system in the building for suppressing odors. Manage ventilation odors to the out-side to prevent odor nuisance.
- ll. Supply and install adequate ventilation to ensure OSHA compliance of the facility.
- mm. Supply and install an elevated picking line with chutes to wheelie bins to allow for manual separation of packaging contaminants in waste.
- nn. Supply and install a magnet for removal of any dangerous metal parts before the organic waste pulper.
- oo. Supply and install a buffer tank feed pump and inline macerator with digestate recycle and blending system.
- pp. Supply and Install a buffer tank (and mixers) to ensure adequate waste buffering to ensure stable plant operations.
- qq. Construct a pump room in-between the digester tanks to provide platform access on it's roof to the digesters for maintenance and monitoring. Internally the pump room must allow for pumping between digesters and into each digester individually from the buffer tank. Heat reticulation and

management will be based here as well as digester sampling and online monitoring systems for temperature, pH and other online measurements.

- rr. Connect effluent to sewers and install a retention pit and testing area suitable for sewer connection requirements.
- ss. External rainwater runoff to be channeled to a retention pond/swale adjacent to the leachate pond.
- tt. Installation of an elevated dewatering system in a refurbished building demarcated for this function for decanting liquid digestate into a liquid digestate tank and spreading thickened solid digestate into a Roro-bin without spillage below it. A diversion system or two bin system needs to be included to allow for periods of bin exchange on site.
- uu. Installation of a digestate liquid fraction tank (with stirring functionality to suspend settleable solids).
- vv. Installation of tanker filling point for bottom or top filling of tankers with flow metering.
- ww. Supply of a digestate liquid fraction tanker (10-20 kL) for use as distribution of digestate liquid to clients and to Pikitup for dust suppression.
- xx. Supply and installation of insulated and clad digester tanks with adequate heating and mixing capacity (to be configurable in series or in parallel).
- yy. Supply and install gas storage capacity is required in at least one of the digester roofs.
- zz. Supply and install desulphurization equipment (which can be done externally or internally but requires that the process meets the upgrading plant section input specification for hydrogen sulfide and does not add any additional nitrogen to the biogas).
- aaa. Supply and install dehumidification is to be installed to ensure biogas humidity complies with the upgrading system (including all condensate traps as required)
- bbb. Supply and install biogas blower (s) may be needed for ensuring adequate pressure for the inlet of the contractor selected upgrading plant.
- ccc. Supply and install a biogas upgrading plant from a reputable vendor utilizing either, water scrubbing, amine scrubbing, membrane or pressure swing absorption technology. Care should be taken that the upstream input spec is achievable for the plant and that the technology is suitable for achieving the downstream biomethane specification for vehicle use.
- ddd. Supply and install a system downstream from the biomethane plant for the stanching of the biomethane.
- eee. Supply and install a biomethane dehumidifier if required (water scrubbing technology requirement).
- fff. Supply and install a biomethane compressor station that runs in tandem with the biomethane upgrading plant to compress biomethane to 250 barg.
- ggg. Supply and install a supply line from the Egoli Gas connection to the CNG compression station to act as an alternative fuel source for filling vehicles when the biogas plant is down or when it is starting up.
- hhh. Supply and install a high pressure biomethane gas storage system that allows for priority filling of vehicles.
- iii. Supply and install a 2 lane vehicle filling station with RFID card readers for billing and NGV1 and NGV2 filling connectors. Metrobus vehicles need to fill within 10 min of connection.

- jjj. Establish a composting operation at the demarcated area on the neighboring JMPD Academy grounds for digestate maturation and addition of other manures for composting. This should include compost loading, turning, watering, screening and bagging capabilities. Electrical connection would be provided. On site JMPD ablutions to be used by staff.
- kkk. Supply and install a 20kW roof mounted solar PV system for power generation.
- lll. Supply and install a UPS for control system and security system backup.
- mmm. Establish internet connectivity.
- nnn. Connect to utilities.
- ooo. Commission the facility.
- ppp. Perform performance tests on completion based on throughput over 1 week of feedstock and average output of on specification biomethane and digestate cake.
- qqq. Supply suitable digester seeding material.
- rrr. General:
 - i. Area lighting as required for safe operations.
 - ii. Earthing and bonding
 - iii. Provide electrical and water outlets for maintenance and cleaning,
 - iv. Install a workshop area and outfitting with suitable tools for operations.
 - v. Provide consumables and spares storage area.
 - vi. Provide security personnel hut at gate.
 - vii. Provide lightning protection.
 - viii. Provide compressed and conditioned air where and when required (could centralize).
 - ix. Install public announcement system.
 - x. Install fire detection and protection system (incl. fire water tanks and pumps).
 - xi. Reject waste collection bins for disposal to landfill.
 - xii. Provide functioning Information Technology system for monitoring plant performance, capturing data from weighbridge, gas supply, level, temperature, pressure and flow sensors for an overall reporting package.
 - xiii. Implement a comprehensive plant wide SCADA system that is remotely accessible and displayed on multiple computer screens in the control room.
 - xiv. Provide all waste bins.
 - xv. Supply startup chemicals and critical spares

- Part 2 - O&M

- a. Daily operations of the waste processing facility (7 days a week). The facility should be open for the filling of gas for 16 hours per day and for processing of waste a minimum of 8 hours per day.
- b. Scheduling of waste deliveries with JFPM and performing this function as per the agreed schedule.
- c. Scheduling of Metrobus filling schedules as shunters drive busses to the filling point after peak times.

- d. Scheduling of digestate liquid removal to dust suppression on Robinson deep landfill using own tanker and coordinating with Pikitup and performing this function as per the agreed schedule.
- e. Scheduling digestate liquid offtake by JCPZ and Social Development for irrigation purposes.
- f. Scheduling of digestate solids removal to composting at JMPD Academy site.
- g. Scheduling of compost offtakes from JMPD Academy site to Social Development and JCPZ.
- h. Managing compost sales from JMPD Academy site once compost is registered.
- i. Excess liquid digestate management preferably for nutrient use and irrigation.
- j. On site separation at source at JFPM to remove bulk contaminants.
- k. Removal of waste from facility.
- l. Disposal of excess or unsuitable waste to Robinson Deep.
- m. Composting of digestate at neighboring JFPM academy site.
- n. Utilization of digestate liquor for nutrient use and/or dust suppression on Robinson Deep landfill.
- o. Filling of Metrobus busses and other onsite vehicles with biomethane. The operators should be able to fill vehicles as a backup but Metrobus drivers will be trained to fill their own busses.
- p. Cleaning of facility and housekeeping.
- q. Service and Maintain equipment.
 - i. As per service schedules of OEM's.
 - ii. Unplanned and emergency servicing and maintenance.
- r. Managing staff involved in all activities on site.
- s. Manage and report on SHEQ.
- t. Perform statutory test on pressure vessels and other statutory equipment on the required intervals.
- u. Emergency drills
- v. Reporting monthly on performance, events and activities in a mutually agreed reporting format.
- w. Data capturing to keep record of:
 - a. Waste processed;
 - b. Plant output performance and uptime;
 - c. Consumption of utilities and consumables;
 - d. Identified vehicles delivering waste and collecting products and wastes (RFID card filling system for busses);
- x. Maintain laboratory capabilities for digester monitoring and additional waste selection from time to time.
- y. Provide 24 hour site security.
- z. Managing sales of products to 3rd parties.
- aa. Recordkeeping of all deliveries, receipts and bills.
- bb. Procurement of all vehicles, tools, services, spares and consumables required for the operation of the plant.
- cc. Facilitating visitors from the public based on a booking system that allows visits from Schools, Universities and interest groups (up to 20 people).
- dd. Venting of biogas to Energy Systems when biomethane storage is full and biogas is produced at <100 ppm H₂S and at >50% methane. Otherwise, excess biogas must be flared by the biomethane plant flare.

- ee. Managing facility finances and invoicing to Client reimbursable costs, namely:
 - a. Procurement of hot water at 75-85 deg C from Energy Systems at R 9.5/GJ for heating the digesters and returning of cold water <65 deg C to Energy Systems. (reimbursable)
 - b. Procurement of all the produced electricity from Energy Systems produced from it's waste heat generation system (maximum 170 kW) at R 1.50 / kWh. (reimbursable). Any shortfall will be supplied through the existing Pikitup connection to City Power free of charge.
 - c. Prorata waste collection costs based on contracted rate.
 - d. Prorata waste disposal costs based on contracted rate.
 - e. Prorata digestate liquid management and disposal costs based on contracted rate.
- ff. Complying with the requirements of the Occupational Health and Safety Act (ACT 85 Of 1993) including General Maintenance, Inspections, Training and Service Works.
- gg. Tenderers to note that contract applicable to maintenance of the biodigester plant will be NEC 3 Term Service Contract that will come into effect upon practical completion of the biomethane plant works. Maintenance contract will not apply to any works or components that are subject to a defects liability period of 12 months.

- Contingency

- Allowance of 15% overall for EPC and O&M scope of works (to remain the Client's).

Note: Successful bidder to take note of the following:

- Successful bidder will accept responsibility for design for suitability and fit for purpose;
- All equipment is to be commissioned and fully operational to meet design/operational requirements;
- Downtime of biomethane plant to be kept to a maximum of 5%;
- Prior approval of planned downtime during construction is required;

1.7 Recording of weather

The Contractor shall erect an effective rainfall gauge on the site and record the daily rainfall figures in a book. Such book shall be handed to the employer's representative for his signature no later than 1 day after rain that is considered to justify a compensation event occurs, but such signature is not an acknowledgement by the Employer that the event is a compensation event.

1.8 Unauthorised persons

The Contractor shall keep unauthorized persons from the works at all times. Under no circumstances may any person except guards be allowed to sleep on the building site.

1.9 Management meetings

A Schedule of meetings will be agreed with the contractor.

1.10 Daily records

The Contractor is instructed to keep a set of signed-off daily diaries.

1.11 Payment certificates

Monthly valuations of completed work, including materials on site is to be completed and presented to the client representative by no later than the 20th of each month to be assessed for payments. The payment certificate will be issued no later than the 25th of each month (Including Contractor's tax invoice) to the Project Manager or Supervisor for payment within 30 calendar days. Notwithstanding the above, the Employer may request the Contractor to submit claims every 2 weeks to foster better cash flow for the Contractor.

C3.3 PARTICULAR SPECIFICATIONS

In addition to the Standardized and Project Specifications the following Particular Specifications shall apply to this contract and are separately bound in hereafter.

PARTICULAR SPECIFICATION	PAGE NO.
HEALTH AND SAFETY BASELINE SPECIFICATIONS	Annexure A
BASELINE RISK ASSESSMENT	Annexure B
SHEQ POLICY	Annexure C
BIOCNG SPECIFICATION	Annexure D
JFPM WASTE DATA	Annexure E
CONCEPT PLANT LAYOUT	Annexure F
CONCEPT STRUCTURAL DESIGN REPORT	Annexure G
3D MODEL VIEWS	Annexure H
CONCEPT CIVILS DESIGN REPORT	Annexure I
DRAFT EQUIPMENT LIST	Annexure J
BLOCK FLOW DIAGRAM	Annexure K
LOCALITY MAP	Annexure L
GEOTECHNICAL STUDY REPORT	Annexure M
PROCESS DESCRIPTION	Annexure N
COJ BIOMETHANE UJ FEASIBILITY STUDY	Annexure O
CITY POWER EMBEDDED PV GENERATION Application Form	Annexure P
CITY POWER EMBEDDED PV GENERATION Commissioning Form	Annexure Q
MANAGEMENT BUILDING BRIEF	Annexure R
DRAFT OFFTAKE AGREEMENT	Annexure S
COJ BIODIGESTER CONTRACTING STRUCTURE	Annexure T
SITE DESCRIPTION	Annexure U
TESTS AFTER COMPLETION	Annexure V
TESTS DURING OPERATION	Annexure W

C3.4 DRAWINGS

3.4.1 TENDER DRAWINGS

Note: Concept Design Drawings available, project is Turnkey and EPC Contractor to conclude Detailed Design & Construction Drawings.

LIST OF DRAWINGS			
DRAWING NUMBER / SHEET NUMBER	CURRENT REVISION	CURRENT REVISION DATE	DRAWING DESCRIPTION / SHEET NAME
ED-002-ENG-DWG-DIM-003_SHEET 01	REV 01	2021-06-14	BIO-METHANE GAS PLANT 3D VIEW OF PLANT
ED-002-ENG-DWG-PFD-001_SHEET 01	REV 12	2019-09-01	PROCESS FLOW DIAGRAM: WASTE RECEIVING AND PROCESSING
ED-002-ENG-DWG-PFD-001_SHEET 02	REV 12	2019-09-01	PROCESS FLOW DIAGRAM: BIOGAS PRODUCTION
ED-002-ENG-DWG-PFD-001_SHEET 03	REV 12	2019-09-01	PROCESS FLOW DIAGRAM: UPGRADING COMPRESSION AND FILLING
ED-002-ENG-DWG-PFD-001_SHEET 04	REV 12	2019-09-01	PROCESS FLOW DIAGRAM: DIGESTATE TREATMENT
ED-002-ENG-DWG-PFD-001_SHEET 05	REV 12	2019-09-01	PROCESS FLOW DIAGRAM: HOT WATER SUPPLY
ED-002-ENG-DWG-PFD-001_SHEET 06	REV 12	2019-09-01	PROCESS FLOW DIAGRAM: ADDITIONAL FEEDING
ED-002-ENG-DWG-LAY-001_SHEET 01	REV 0M	2021-06-27	BIO-METHANE GAS PLANT SITE PLAN
ED-002-ENG-DWG-LAY-003_SHEET 01	REV 0M	2021-06-27	BIO-METHANE GAS PLANT SITE PLAN
ED-002-ENG-DWG-LAY-004_SHEET 01	REV 0M	2021-06-27	BIO-METHANE GAS PLANT SITE PLAN
4917-S-001-P	REV A	2019-09-09	STRUCTURES SITE LAYOUT
4917-S-201-P	REV A	2019-09-09	NEW CONTROL ROOM, ABLUTIONS & MESS-CONTROL ROOM
4917-S-301-P	REV B	2019-09-09	REFURBISHMENT OF WASTE PROCESSING BUILDING
4917-S-601-P	REV A	2019-09-09	NEW PLINTHS LAYOUT & DETAILS
ED-002-ENG-DWG-DIM-004_SHEET 01	REV 0D	2019-10-29	BIO-METHANE GAS PLANT PICKING PLANT LAYOUT 3D
ED-002-ENG-DWG-DIM-005_SHEET 01	REV 0B	2019-10-29	BIO-METHANE GAS PLANT 3D PICKING PLANT
ED-002-ENG-DWG-DIM-006-SHEET 01	REV A	2021-09-20	MANAGEMENT OFFICE INTERNAL DIMENSIONS

PART 4: SITE INFORMATION

Document reference	Title	No of pages
	This cover page	1
C4.1	<i>Locality Plan</i>	1
	Total number of pages	2

C4.1 LOCALITY PLAN

The work is located at the following sites in Robinson Deep, Johannesburg:

- JMPD Academy – composting site and store
- JFPM – waste collection point
- Pikitup Robinson Deep Landfill – Biomethane Plant facility and energy supply from Joburg Landfill Gas.

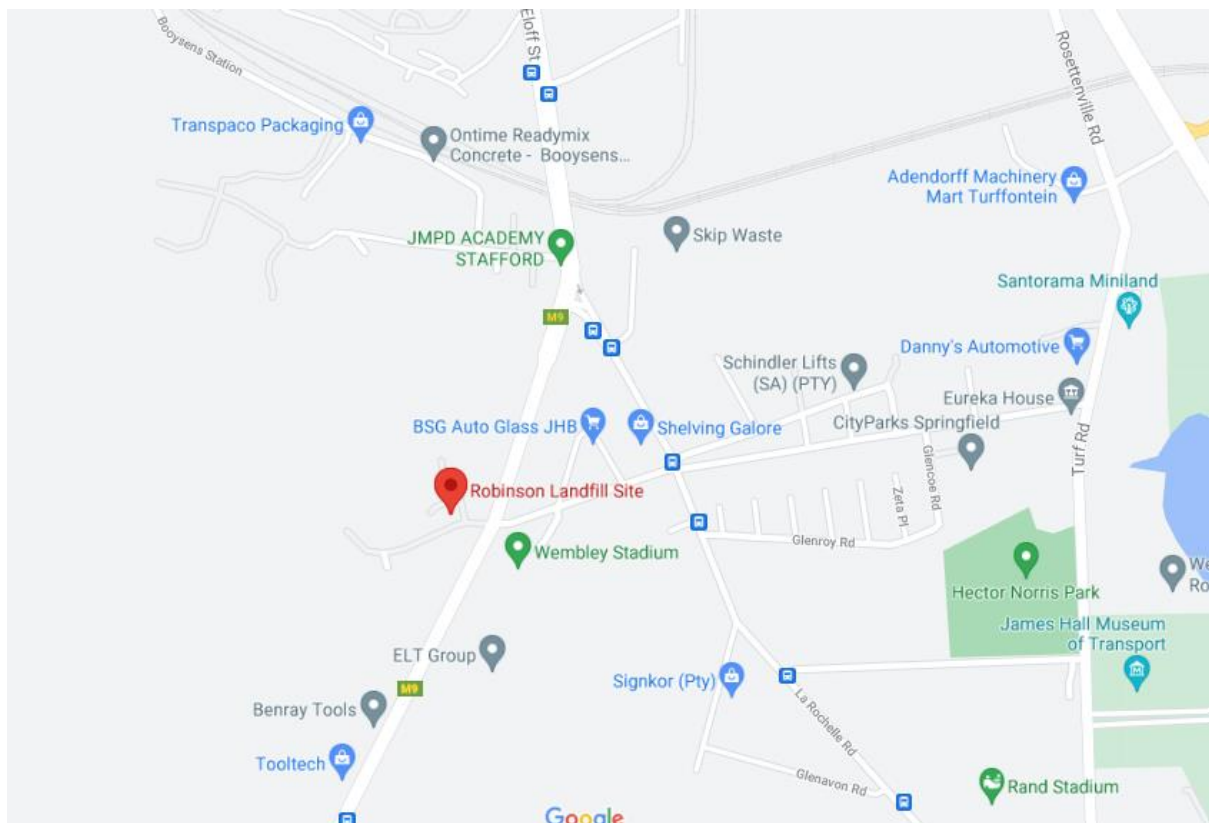


Figure 1: Robinson Deep, Johannesburg Locality Map

See Annexure L: Locality Map (with coordinates).