
TESTS AFTER COMPLETION (TAC)

1. Introduction

This document comprises an annexure to the NEC 3 ECC Option A Contract Agreement for “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” (Contract 1) and sets out provisions relating to Tests After Completion which are essentially performance tests to determine whether the process plant facility has achieved the Guaranteed Performance Criteria, or as a minimum and subject to payment by the Contractor of Low Performance Liquidated Damages, the Guaranteed Minimum Performance Criteria.

The Parties have agreed to undertake the following Tests After Completion:

- Test 1 – Plant Availability Test
- Test 2 – Plant Throughput Capacity Test
- Test 3 – CNG Production Test
- Test 4 – Biomethane Quality Test
- Test 5 – Solids in liquid digestate test
- Test 6 – Compost moisture test

This document sets out the rules and consequences associated with the above Tests.

2. Definitions

The following words and expressions shall have the following meanings in this document:

“**Design Criteria**” means the works information set out in the C3.2 Contractor Works Information found in Volume 3 of the NEC Contract Data.

“**Contract Agreement**” means the agreement entered into between the Employer and the Contractor relating to an EPC contract to design and construct the envisaged facility.

“**Construction Period**” The period of time from commencement to completion of hot commissioning.

“**Completion Date**” means the date of completion as contemplated by the contractors proposed schedule at time of contracting.

“**Guaranteed Functional Performance Criteria**” means the performance criteria to demonstrate in each Test that the Test has passed the performance requirements guaranteed by the Contractor.

“**Guaranteed Minimum Performance Criteria**” means the minimum performance requirements which must be achieved in order to avoid the consequences set out in the first sub-paragraph of paragraph 14 below.

“**Feedstock**” shall be organic waste made available by the Employer at the Joburg Fresh Produce Market (JFPM) with less than 10% non-organic contamination by weight.

“**Performance Tests**” or “**Tests**” are the Tests 1 to 6 inclusive set out in this Document.

3. Testing window & notification

After construction and commissioning, Contractor shall ramp-up and optimise the plant.

The Contractor may on reasonable notice, with a minimum notice of 14 days, call for any Performance Tests to commence prior to the Completion Date.

In any event, on the expiry of the Construction Period either Party may call for the commencement of the Performance Tests.

All Performance Tests shall be completed on or before the Completion Date. In circumstances where any Party can demonstrate that any failure to achieve completion of Performance Tests prior to the Completion Date is the fault of the other or due to matters outside of its reasonable control, the non-offending shall be entitled to an extension of time.

Each Performance Test is an individual test. The Parties will make every effort to co-ordinate tests to save costs, but it is acknowledged that the priority is to properly complete the individual tests to determine a valid outcome. Scoring from the performance tests will be combined into an overall score which will be used to calculate damages, if any.

4. Employer's general obligations

The Employer shall procure the following:

- That the Contractor and any of its sub-contractors has full access to the Facility for the duration of the tests.
- That the facility has appropriate water and power to enable the tests to take place unhindered.
- That any third-party interface with a Counterparty to a Commercial Contract for any test is managed such that the third party performs its obligations in such a way not to hamper or restrict the Contractor from achieving the performance requirements.
- That the Employer's specific obligations set out in each Test are complied with.

5. Contractor's general obligations

The Contractor shall procure the following:

- That appropriately trained and qualified personnel shall be present to operate the plant during any Test.
- Any equipment requiring calibration shall be appropriately calibrated or otherwise the means of measuring shall be in sound working order.
- That the consumables and reagents required for undertaking any Test are available and to the extent possible charged into the plant prior to the Test commencing.
- That the relevant plant is in good working order and operating stably prior to the undertaking of any Test.

6. Test 1 – Plant availability test

a. Purpose of Test:

The purpose of this test is to determine whether the plant (as per the Design Criteria) is capable of processing Feedstock into biomethane fuel for vehicles reliably and for a minimum of 95% availability without mechanical breakdown

b. Required Results:

Guaranteed Performance Criteria - Demonstrate that the plant can operate reliably by ensuring 95% availability (i.e. without mechanical break down or stoppages) over the Test Period.

Guaranteed Minimum Performance Criteria - Demonstrate that the plant can operate reliably by ensuring minimum of 90% availability (i.e without mechanical break down or stoppages) over the Test Period.

c. Test Period:

Testing shall take place over three consecutive days with standard operating single shifts of 8 hours each.

d. Basis of Test:

The anticipated Feedstock to be processed will be 50 tonnes per day. Although it is not the purpose of the Test to measure throughput in order to properly demonstrate reliability the Contractor shall ensure that as a minimum 85% of the waste shall be processed.

During this Test the plant will demonstrate that it shall operate for 95% availability. The success or failure of the Test will be measured with the SCADA (and appropriate data imported from the weighbridge).

e. Employer's Responsibility:

Provide enough Feedstock to enable the Contractor to reasonably pass the test. At least 50 tonnes of Feedstock shall already be in situ at the commencement of the Test. The balance of the Feedstock shall be collected by the contractor at regular intervals during the test period from the Johannesburg Fresh Produce Market.

A reasonable amount of unsuitable material is permitted, provided it is reasonably capable of being separated by hand and does not restrict the Contractor's ability to effectively demonstrate plant performance.

Contractor may only claim that out of specification Feedstock is a cause of failure in circumstances where it can reasonably demonstrate that, but for the out of specification feedstock, the Test would likely have passed.

f. Requirements for Deemed Passing:

If during normal operations at any time from the commencement of commissioning up until the Completion Date, if over three consecutive days during the effective seven normal operating shifts, the Plant has proven available for >95% of the time.

7. Test 2 – Plant throughput capacity test

a. Purpose of Test:

The purpose of this test is to determine whether the plant is capable of processing a minimum of:

- 50 t/day of feedstock

b. Required Results:

Guaranteed Performance	Minimum	Guaranteed Performance
≥ 45 t/day		≥ 50 t/day

c. Test Period:

Testing shall take place over three standard operating shifts of 8 hours each on three consecutive days.

d. Basis of Test:

Contractor shall demonstrate that it shall clear the requisite tons set out in “b” above from the waste holding area by depositing the waste into the relevant feeding hoppers for the organic feed line.

Quantities of feedstock shall be measured at the main weighbridge. No waste shall be present on the floor at the end of the test period. By the end of the test period all waste shall have been processed into the digesters and the associated amount of digestate and biogas products would be produced.

Contractor may not turn off or unreasonably impede any equipment within the plant in an effort to increase process speed at the inlet of the plant.

e. Employer’s Responsibility:

Provide (as in, avail at the JFPM site) sufficient quantities of on-specification feedstock to enable the Contractor to reasonably pass the test. At least 50 tons shall already be available at the commencement of the Test (this is to be monitored over the weighbridge). The balance of the feedstock shall be collected at regular intervals during the test period by the Contractor.

Reasonable amounts of unsuitable material is permitted provided it is reasonably capable of being separated by hand either, at JFPM, in the main processing building or on the conveyor before the pulper/hammermill (as would be anticipated during normal operating conditions) without restricting the Contractor's ability to effectively demonstrate plant performance.

Contractor may only claim that out of specification Feedstock is a cause of failure in circumstances where it can reasonably demonstrate that but for the out of specification feedstock the Test would likely have passed.

f. Requirements for Deemed Passing:

If during normal operations at any time up until the Completion Date, if over three consecutive days during the effective normal operating shifts, the Plant has processed 50 tons per day of Feedstock without residues remaining on site.

8. Test 3 – CNG production test

a. Purpose of Test:

The purpose of the test is to demonstrate that the plant can produce the quantities of Compressed Natural Gas (CNG) equivalent from biomethane required to meet the guaranteed CNG quantities which the Employer is producing for the Metrobus buses.

b. Required Results:

Guaranteed Performance	Minimum	Guaranteed Performance
405 GJ /week		450 GJ/week

c. Test Period:

The Test shall take place over one 7 day week.

d. Basis of Test:

The Contractor shall fill Metrobus buses with CNG over the test period with 450 GJ of CNG equivalent biomethane. Test will be measured by the calibrated flow meters situated at the outlet of filling points. Flared or recycled biogas, biomethane or CNG shall not be included except if for reasons due to the employer.

e. Employer's Responsibility:

Provide enough Feedstock to enable the Contractor to reasonably pass the test. At least 50 tonnes of Feedstock shall already be in situ at the commencement of the Test. The balance of the Feedstock shall be collected by the contractor at regular intervals during the test period from the Johannesburg Fresh Produce Market.

A reasonable amount of unsuitable material is permitted, provided it is reasonably capable of being separated by hand and does not restrict the Contractor's ability to effectively demonstrate plant performance.

Contractor may only claim that out of specification Feedstock is a cause of failure in circumstances where it can reasonably demonstrate that, but for the out of specification feedstock, the Test would likely have passed.

The Employer shall ensure that adequate offtake space for the digestate products are available (for the contractor to transport it to) and that the buses collect the gas as envisaged in the filling schedule contemplated in the process description.

f. Requirements for Deemed Passing:

Over any consecutive 7 (24 hour) day period during normal operations until the Completion Date the Contractor shall fill the Metrobus buses with ≥ 450 GJ of on specification CNG. Note – it is a condition to deemed passing that during this period an A and B sample of BioCNG is taken as per the sampling requirements in Test 4 below.

9. Test 4 – Biomethane quality test

a. Purpose of Test:

The purpose of the test is to demonstrate that the plant can produce the specification of bioCNG required to meet the guaranteed CNG specification which the Employer is utilising in the Metrobus buses.

b. Required Results:

Guaranteed Minimum Performance	Guaranteed Performance
<10% on any of the component specifications	As per Annexure D
As per Annexure D	

c. Test Period:

Sample to be taken during Test 3 above.

d. Basis of Test:

An A and B sample of CNG shall be taken in an appropriate sample container by a competent person capable of taking a valid sample from any CNG dispenser.

Both A and B samples will be sent to an independent laboratory who will analyse the CNG to determine if it is within specification.

e. Employer's Responsibility:

Provide enough Feedstock to enable the Contractor to reasonably pass the test. At least 50 tonnes of Feedstock shall already be in situ at the commencement of the Test. The balance of the Feedstock shall be collected by the contractor at regular intervals during the test period from the Johannesburg Fresh Produce Market.

A reasonable amount of unsuitable material is permitted, provided it is reasonably capable of being separated by hand and does not restrict the Contractor's ability to effectively demonstrate plant performance.

Contractor may only claim that out of specification Feedstock is a cause of failure in circumstances where it can reasonably demonstrate that, but for the out of specification feedstock, the Test would likely have passed.

The Employer shall ensure that adequate offtake space for the digestate products are available (for the contractor to transport it to) and that the buses collect the gas as envisaged in the filling schedule contemplated in the process description.

f. Requirements for Deemed Passing:

None – During the period for deemed passing in Test 3 an A and B sample will be taken and analysed to determine passing of this Test.

10. Test 5 – Solids in liquid digestate test

a. Purpose of Test:

The purpose of the test is to demonstrate that the plant does not produce a liquid fraction of digestate with an unmanageable amount of solids.

b. Required Results:

Guaranteed Minimum Performance	Guaranteed Performance
10% less than GP	<3% Total Solids

c. Test Period:

Sample to be taken during Test 3 above.

d. Basis of Test:

An A and B sample of liquid digestate shall be taken in an appropriate sample container by a competent person capable of taking a valid sample from the liquid digestate discharge point.

Both A and B samples will be sent to an independent laboratory who will analyse the Total solids content of the sample to determine if it is within specification.

e. Employer's Responsibility:

Provide enough Feedstock to enable the Contractor to reasonably pass the test. At least 50 tonnes of Feedstock shall already be in situ at the commencement of the Test. The

balance of the Feedstock shall be collected by the contractor at regular intervals during the test period from the Johannesburg Fresh Produce Market.

A reasonable amount of unsuitable material is permitted, provided it is reasonably capable of being separated by hand and does not restrict the Contractor's ability to effectively demonstrate plant performance.

Contractor may only claim that out of specification Feedstock is a cause of failure in circumstances where it can reasonably demonstrate that, but for the out of specification feedstock, the Test would likely have passed.

The Employer shall ensure that adequate offtake space for the digestate products are available (for the contractor to transport it to) and that the buses collect the gas as envisaged in the filling schedule contemplated in the process description.

f. Requirements for Deemed Passing:

None – During the period for deemed passing in Test 3 an A and B sample will be taken and analysed to determine passing of this Test.

11. Test 6 – Compost moisture test

a. Purpose of Test:

The purpose of the test is to demonstrate that the composting section of the plant produces a compost that can be registered as a Group 2 organic fertiliser which requires a moisture content <40% by mass.

b. Required Results:

Guaranteed Minimum Performance	Guaranteed Performance
10% less than GP	<40% moisture

c. Test Period:

Sample to be taken during Test 3 above.

d. Basis of Test:

An A and B sample of composted and matures solid digestate shall be taken in an appropriate sample container by a competent person capable of taking a valid sample from the final compost product pile post screening.

Both A and B samples will be sent to an independent laboratory who will analyse the Total solids content of the sample to determine if it is within specification.

e. Employer's Responsibility:

Provide enough Feedstock to enable the Contractor to reasonably pass the test. At least 50 tonnes of Feedstock shall already be in situ at the commencement of the Test. The balance of the Feedstock shall be collected by the contractor at regular intervals during the test period from the Johannesburg Fresh Produce Market.

A reasonable amount of unsuitable material is permitted, provided it is reasonably capable of being separated by hand and does not restrict the Contractor's ability to effectively demonstrate plant performance.

Contractor may only claim that out of specification Feedstock is a cause of failure in circumstances where it can reasonably demonstrate that, but for the out of specification feedstock, the Test would likely have passed.

The Employer shall ensure that adequate offtake space for the digestate products are available (for the contractor to transport it to) and that the buses collect the gas as envisaged in the filling schedule contemplated in the process description.

f. Requirements for Deemed Passing:

None – During the period for deemed passing in Test 3 an A and B sample will be taken and analysed to determine passing of this Test.

12. Passing, failing and retesting

In the event that any Test achieves the Guaranteed Performance Criteria then the Test is considered passed. Furthermore, if the requirements for deemed passing are met then no Test is required and the Test is deemed passed for all purposes.

In the event of a "Failed Test" (i.e where a Test does not achieve the Guaranteed Performance Criteria for any reason) then that Test shall either have failed for reasons attributable to the Contractor or for reasons attributable to the Employer. Subject to the final sub-paragraph of this paragraph 11, each Party shall have an opportunity to retest after a Failed Test attributable to them. However, the first Party to reach two Failed Tests is construed as the cause of Failure. In circumstances where the Contractor is the cause of Failure then, subject to having achieved Guaranteed Minimum Performance Criteria, he shall be liable for Low Performance Liquidated Damages in accordance with clause 13. In the event it is the Employer who is the cause of failure then, subject to the final sub-paragraph below, the Contractor shall be deemed to have passed the Test.

If the Guaranteed Minimum Performance Criteria shall not have been achieved in accordance with paragraph 13, then the Employer may at its cost require a further Test to be undertaken. If at this further Test the Employer shall have demonstrated that its responsibilities have been met and the Test still fails, (i.e the Test failed for reasons attributable to the Contractor) then the results of a subsequent and final Test shall become definitive. If the Test fails for reasons attributable to the Employer, then notwithstanding the non-achievement of Guaranteed Minimum Performance Criteria the Test shall be deemed passed by the Contractor. In the case of this additional testing the Completion date shall be extended as required.

13. Guaranteed minimum performance criteria

In the event that any Test fails to achieve as a minimum the Guaranteed Minimum Performance Criteria on or before the Completion Date (or as the same may be extended pursuant to the final

sub-paragraph in 12 above) notwithstanding the fact that any other Test may have achieved the Guaranteed Minimum Performance Criteria, the Employer is entitled to treat the Works as if they had not been taken over and the Employer shall have all rights and benefits of clause 40 of the General Conditions.

A Test shall be entitled to be treated as having achieved the Guaranteed Minimum Performance Criteria in the following circumstances:

- If the results of any Test demonstrate that the Guaranteed Minimum Performance Criteria have been achieved (i.e If during the first Test the Guaranteed Minimum Performance Criteria have been met and in a subsequent Test it is not, the Contractor shall be entitled to rely on the first Test in support of the achievement of the Guaranteed Minimum Performance Criteria).
- As a result of any deemed passing of any Performance Test.
- If any Test (after all retest opportunities have been exhausted) is finally construed as having failed on account of the fault of the Employer.
- If the Employer accepts in its sole discretion the Guaranteed Minimum Performance Criteria have been achieved during normal operations and confirms the same in writing.

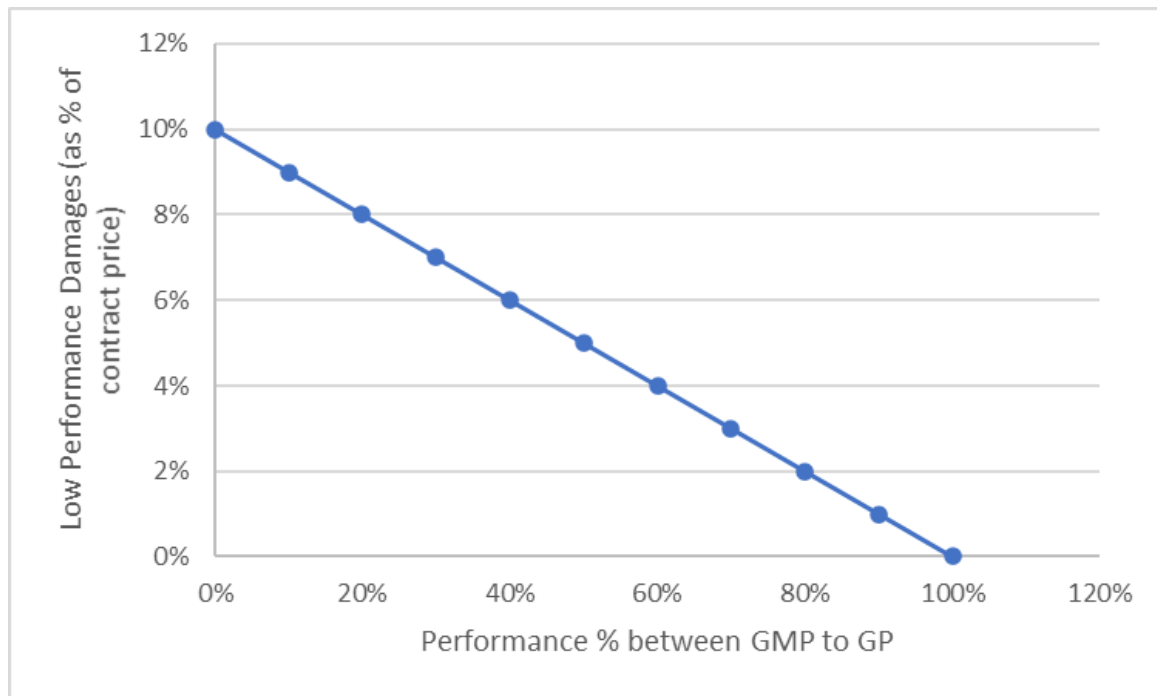
Contractor agrees that it shall have no basis to claim that any beneficial occupation of the Works by the Employer is a defence against any action by the Employer as regards the enforcement of its rights in respect of this paragraph.

14. Low performance liquidated damages

In circumstances where the Contractor shall have achieved the Guaranteed Minimum Performance Criteria but failed (for reasons not attributable to the Employer) to have achieved the Guaranteed Performance Criteria, then Low Performance Liquidated Damages shall be paid by the Contractor as its sole liability for failure to achieve Guaranteed Performance Criteria.

In order to calculate the basis for determining Low Performance Liquidated Damages, then the results of both failed Tests shall be averaged. In the event that any one Test failed to achieve the Guaranteed Minimum Performance Criteria, then the actual % underperformance (and in tests with multiple components to be measured, the lowest performing component) shall be used as the result for the failed test for calculating the average of the Tests.

Low Performance Liquidated Damages shall be calculated on a straight line basis between 0% and 10% of the Contract Price (Contract 1) for each test as follows:



Where:

X axis is the Average Performance (expressed as a Percentage of performance) between the Guaranteed Minimum Performance Criteria (0%) and the Guaranteed Performance Criteria (100%)

Y axis is Low Performance Liquidated Damages (expressed as a Percentage of the Contract Price)

The overall maximum liability for Low Performance Liquidated Damages shall not exceed 10% of Contract Price (Contract 1).

15. Independent expert

The Parties undertake to appoint an independent third party (the “**Expert**”) to witness any Test for the purposes of making a determination as to the results of any Test and in the event of a failed test, the party to whom the failure is attributable. The Expert shall seek to achieve consensus between the Parties as to the result of any Test, but in the absence of consensus within 7 days from the date when results are reasonably available, he shall make a written determination. The written determination shall, save in the case of manifest error, be final and binding.

The Expert shall be appointed by agreement or failing agreement by the President for the time being of the Consulting Engineers of South Africa who shall appoint an engineer of no less than 10 years standing with appropriate skills and experience in waste to energy projects.

In making a determination the Expert shall act as expert and not as arbitrator.

The cost of the Expert shall be borne as follows: The First Test shall be for the account of the Employer. Thereafter any subsequent Test shall be for the account of the Party responsible for the failure of the previous Test.

16. Cost of tests

Save as set out in 15 above, in respect of the first Test, each Party shall bear its own costs.

In any subsequent Tests, the Party who caused the previous Test to fail shall meet the subsequent costs of a retest provided that:

- Operational Staff shall be paid by the Contractor;
- Each party shall meet the costs of its primary representatives;
- Employer shall meet the costs of power and utilities (potentially to be reimbursed to the contractor if from nominated sub-contractors elected by the Employer).

The costs of retesting to the extent incurred by the Contractor shall be construed as part of the Contract Price and not as a liability counting towards any liability cap.