



AIRPORTS COMPANY
SOUTH AFRICA

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KING SHAKA INTERNATIONAL AIRPORT

TENDER NO: KSIA7806/2025/RFP

**PROCUREMENT OF A CIDB GRADE 9 CE CONTRACTOR THE COMPLETION OF BRAVO TAXIWAY
EXTENSION AT KING SHAKA INTERNATIONAL AIRPORT FOR A PERIOD OF 12 MONTHS**

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C1.1: FORM OF OFFER AND ACCEPTANCE (AGREEMENT)

OFFER

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

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FOR THE

**PROCUREMENT OF A CIDB GRADE 9 CE CONTRACTOR THE COMPLETION OF BRAVO TAXIWAY
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The Tenderer, identified in the Offer signature block, has examined the documents listed in the Tender Data and addenda thereto as listed in the Tender Schedules, and by submitting this Offer has accepted the Conditions of Tender.

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

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

.....
.....Rand (in words);

R(in figures)

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

For the Tenderer	Signature.....
	Name.....
	Capacity

Name and address of organization	
	
	

Signature and name of witness	Signature.....
	Name.....

Date

ACCEPTANCE

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

The terms of the contract, are contained in:

- Part C1: Agreements and Contract Data, (which includes this Agreement)
- Part C2: Pricing Data
- Part C3: Scope of Work.
- Part C4: Site Information

and drawings and documents or parts thereof, which may be incorporated by reference into Parts C1 to C4 above.

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

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

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

Signature

Name

Capacity

Date

For the

Employer

Airports Company South Africa SOC Limited
King Shaka International Airport
King Shaka Dr, La Mercy
4407

Name and
signature
of witness

Date

SCHEDULE OF DEVIATIONS

Notes:

- 1. The extent of deviations from the tender documents issued by the Employer prior to the tender closing date is limited to those permitted in terms of the Conditions of Tender,
- 2. A Tenderer’s covering letter shall not be included in the final contract document. Should any matter in such, letter, which constitutes a deviation as aforesaid become the subjects of agreements reached during the process of, offer and acceptance, the outcome of such agreement shall be recorded here,
- 3. Any other matter arising from the process from offer and acceptance either as a confirmation, clarification or change to the tender documents and which it is agreed by the Parties becomes an obligation of the contract shall also be recorded here,
- 4. Any change or addition to the tender documents arising from the above agreements and recorded here, shall also be incorporated into the final draft of the Contract,

1

Subject.....
Details.....

2

Subject.....
Details.....

3

Subject.....
Details.....

4

Subject.....
Details.....

5

Subject.....
Details.....

By the duly authorised representatives signing this Schedule of Deviations, the Employer and the Tenderer agree to and accept the foregoing Schedule of Deviations as the only deviations from and amendments to the documents listed in the Tender Data and addenda thereto as listed in the Tender Schedules, as well as any confirmation, clarification or changes 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:	For the Employer:
Signature	Signature.....
Name	Name
Capacity	Capacity.....
Name and address of organisation	Name and address of organisation
.....	
.....	
.....	
Witness Signature.....	Witness Signature
Name	Name
Date	Date

CONFIRMATION OF RECEIPT

The Tenderer (now Contractor), identified in the Offer part of this Agreement hereby confirms receipt from the Employer, identified in the Acceptance part of this Agreement, of one fully completed original copy of this Agreement, including the Schedule of Deviations (if any) today:

the(day)
of(month)
20(year)
at(place)

For the Contractor

Signature	Signature
Name	Name
Capacity	Capacity

Witness Signature	Witness Signature
Name	Name

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C1.2: CONTRACT DATA

C1.2.1 Conditions of Contract

It will be a condition of contract that:

The contractor shall achieve in the performance of the contract the Contract Skills Development Goal (CSDG) established in the CIDB Standard for Developing Skills through Infrastructure Contracts, published in Gazette Notice No.48491 of 28 April 2023.

The contractor shall achieve in the performance of the contract the Contract Participation Goals (CPG) relating to the engagement of targeted enterprises as established in the CIDB Standard for Indirect Targeting for Enterprise Development through Construction works Contracts Gazette Notice No.36190 of 25 February 2013.

C1.2.2 General Conditions of Contract

The following standardized General Conditions of Contract:

General Conditions of Contract for Construction Works (Third Edition) 2015 (GCC,2015)

GCC, 2015, as prepared by the South African Institution of Civil Engineering (SAICE), shall apply to and constitutes the General Conditions of Contract for this contract. Copies of these conditions of contract are obtainable from the South African Institution of Civil Engineering (SAICE), Private Bag X200, Halfway House 1685, Tel: (011) 805 5947, Fax: (011) 805 5971, email: civilinfo@saice.org.za.

Copies of the General Conditions of Contract are available for inspection and scrutiny at the offices of the Employer and Employers Agent.

The Pro-formats bound with the General Conditions of Contract 2015, from page 96 to page 116 shall not apply to this Contract and shall be replaced with the documentation bound into this Contract Document.

C1.2.3 Special Conditions of Contract

Variations, amendments and additions to the General Conditions of Contract as Special Conditions of Contract prescribed by the Employer are set out below. Each item of the Special Conditions of Contract given below is cross-referenced to the clause in the General Conditions of Contract to which it mainly applies.

The following Special Conditions of Contract as prescribed by the Employer, referring to the General Conditions of Contract for Construction Works, Third Edition, 2015, are applicable to this Contract:

1.1.1.16 Add the following to Clause 1.1.1.16:

"Where reference is made to the term 'Engineer' in the Project Specifications or anywhere in the contract document, the terms 'Engineer and Employer's Agent' shall have the same meaning."

2.4.3 *Add the following Clause 2.4.3*

2.4.3.1 “The originals of all Drawings and Specifications prepared by or on behalf of the Employer’s Agent shall remain in his custody and references herein to delivery to the Contractor of Drawings or Specifications shall relate to true copies thereof.

2.4.3.2 The Contractor shall be entitled to receive free of charge, to the extent provided in the Contract, copies of each such Drawing and Specification and to receive, or reproduce, such additional copies as he shall reasonably require.

All additional copies, whether provided by the Employer’s Agent or reproduced by the Contractor, shall be to the Contractor’s account.

2.4.3.3 One copy of all documents constituting the Contract shall be kept on the Site and be available for perusal by the Employer’s Agent or any person authorised by him.

2.4.3.4 The Contractor shall, in accordance with the Employer’s Agent’s instructions, maintain a register on the Site of all Drawings and revisions thereof in the chronological order in which they are delivered to him.”

Amend the first three lines to read:

4.1.2

“Where any part of the Works, whether permanent or temporary is designed by the Contractor, he shall, notwithstanding any approval of the Employer’s Agent be liable for any error or deficiency in any design, drawing or document and any loss or damage arising out of such error or deficiency.”

Add the following new Clause 4.2.3:

4.2.3

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

4.2.3.2 After compliance by the Employer’s Agent with the provisions of Clause 4.2.3.1, the Contractor shall be responsible for the true and proper setting out of the Works and for the correctness of the position, levels, dimensions and alignment of all parts of the Works and for the provision of all necessary instruments, appliances and labour in connection therewith.

4.2.3.3 If at any time during the progress of the Works, any error shall appear or arise in the position, levels, dimensions or alignment of any part of the Works, the Contractor, on being required to do so by the Employer’s Agent, shall at his own expense rectify such error to the satisfaction of the Employer’s Agent, but if such error is based on incorrect data supplied in writing by the Employer’s Agent or if there is any delay in providing the particulars required in terms of Clause 4.2.3.1, the Contractor shall, in respect of that delay and the Cost of such rectification, be entitled to make a claim in accordance with Clause 10.

The Contractor shall carefully protect and preserve all benchmarks, sight-rails, pegs and other things used in setting out the Works.

The checking of any setting-out or of any line or level by the Employer’s Agent shall not relieve the Contractor of his responsibility for the correctness thereof.”

Liability for Subcontractors

4.4.2

Add the following to Clause 4.4.2 after the last sentence:

"The Contractor shall not subcontract any part of the Contract without the prior written consent of the Employer's Agent, which consent shall not be unreasonably withheld."

Add the following new Clauses:

4.9.

4.9.2: "In order to preclude seizure by the owner of any Construction Equipment being held by the Contractor on a hire-purchase agreement for the purposes of the Contract, the Employer shall be entitled to pay any such owner the amount of any outstanding instalment or other sum owing under any hire or hire-purchase agreement and in the event of his doing so, any amount thus paid by him shall be a debt payable to the Employer by the Contractor and may be deducted by the Employer from any monies owing or that may become owing the Contractor in terms of the Contract, or be recovered at law from the Contractor by the Employer.

4.9.3: When entering into any subcontract for the execution of any part of the works, the Contractor shall incorporate in such subcontract, by reference or otherwise, the provisions of this clause in respect of Construction Equipment brought to the Site by the subcontractor."

Time to instruct commencement of the Works

Add the following to Clause 5.3.3 after the last sentence:

5.3.3

"The Contractor shall not commence working until they have an approved project specific health and safety plan in terms of the Occupational Health and Safety Act, 1993: Construction Regulations, 2003 and complied with the initial requirements thereof."

Add the following paragraph:

5.9.1

"All additional copies, whether provided by the Employer's Agent or reproduced by the Contractor, shall be to the Contractor's account."

Add the following after "the Contractor," in the third line:

5.11.4

"or by reason of any contractor executing construction work, which is not in accordance with, the Contractor's Health and Safety Plan for the Site or which poses a threat to the health and safety of persons."

Add the following new Clause:

5.13.3

"Fifty per cent (50%) of the penalty as stated in the Contract Data (5.13) shall also be applicable should the Contractor fail to achieve the interim milestone dates as stated in Clause C3.5.1(a) (Management of the Works)."

Issue of Certificate of Practical Completion

5.14.2

Replace "the Employer's Agent" in the second line with the following:

", the Contractor shall notify the Employer's Agent, who shall inspect the Works and the Employer's Agent"

Add the following at the end of this Clause:

5.14.4

"However, a Certificate of Completion will not be issued before the Contractor hands over a consolidated Health and Safety file that shall include all the specified information."

In the last sentence:

6.5.3

Delete the first word "If" and replace with "When".

6.6.1

In the first line of Clause 6.6.1.2.1 after the word "sums" and the fourth line of Clause 6.6.1.2.2 after the word "amount" insert "excluding VAT."

6.8.2

Insert "VAT and" after "excluding" in the parenthesis in the third line.

6.10.2

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

"The valuation of such materials shall be based on the purchase price and delivery cost reflected by the relevant invoices or receipts, exclusive of Value Added Tax and discounts to the Contractor and inclusive of any other duties payable on such material. (Value Added Tax will be added only to the nett amount certified by the Employer's Agent as payable to the Contractor in respect of each Payment Certificate, as provided for in Clause 6.10.1;"

6.11

Variations exceeding 15 per cent

Replace "15 per cent" in the heading, the marginal heading and in Clause 6.11.1.3 with "20 per cent".

7.2.1

Add the following to this sub-clause:

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

7.4.1

Add the following to this sub-clause:

"The Contractor shall conduct tests or have them conducted continually on a regular basis, to check the properties of natural materials and processed natural materials and of products manufactured on site, such as concrete and asphalt. Although not a requirement for the Contractor to conduct regular tests on any commercially produced products such as cement, bitumen, steel and pipes, the Contractor shall remain fully responsible for any defective material or equipment provided by him.

Similarly, the quality of all elements of the works shall be checked on a regular basis so as to ensure compliance with the specified requirements.

The intensity of control and of tests to be conducted by the Contractor in terms of these obligations is not specified but shall be adequate to ensure that proper control is being exercised to the satisfaction of the Employer's Agent.

Where any natural materials or products made from natural materials are supplied, upon completion of each element of the construction works, the Contractor shall test and check such materials, products and or elements for compliance with the specified requirements and shall submit his results to the Employer's Agent for approval. Such submission shall include all his measurements and test results and shall furnish adequate proof of compliance with the specified requirements."

7.6.3.3 *Add the following new Clause:*

“To stop any contractor from executing construction work, which is not in accordance with, the Contractor’s health and safety plan for the Site or which poses a threat to the health and safety of persons and to implement the required health and safety measures before continuing.”

8.3.1.4 *Delete and replace with the following:*

“Risk arising from political riot and malicious damage, unless these risks are insurable with the South African Special Risk Insurance Association at the time of tendering and it is stipulated in the Contract Data that the Contractor is to effect insurance against these risks.”

Delete and replace with the following:

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

8.6 *Delete and replace with the following:*

8.6.1 Insurance Effected By The Employer

8.6.1.1 Notwithstanding anything elsewhere contained in this Contract and without limiting the obligations, liabilities or responsibilities of the Contractor in anyway whatsoever (including but not limited to any requirement for the provision by the Contractor of any other insurances) the **Employer** shall effect and maintain for the duration of the construction and maintenance periods of the Contract - as appropriate in the joint names of the Employer, the Contractor and where relevant Sub-Contractors the following insurances which are subject to the terms, limits, exceptions and conditions of the Policy:

a) Contract Works/Contractors Public Liability/ Removal Of Lateral Support Liability

Section 1 Of The Policy – Contract Works

Contract Works Insurance for the full value of the Works to provide cover against accidental physical loss of or damage to the Works, Temporary Works and materials intended for incorporation in the Works all being the subject matter of this Contract including to the extent provided for in the policy whilst in transit or temporarily stored at any premises en route to or from the Site (other than where this is a continuation of Marine Transit) within the territorial limits of the policy.

This insurance may specifically exclude any cost necessary to replace or rectify any of the property insured, which is in a defective condition due to defect in design, plan specification, material or workmanship.

Section II of the Policy – Contractors Public Liability

Public Liability Insurance which provides indemnity against legal liability in the event of accidental death of or injury to persons and/or loss of or damage to property(other than the

Works the subject matter of this Contract) arising from the execution of the Contract with a limit of indemnity of **R75,000,000** in respect of any one occurrence or series of occurrences consequent on or attributable to one source or original cause.

Section III of the Policy – Removal Of Lateral Support Liability

Removal Of Lateral Support Liability which provides indemnity against legal liability in the event of accidental death of or injury to persons and/or loss of or damage to property (other than the Works the subject matter of this Contract) arising out of or in connection with shock or vibration or the removal or weakening of or interference with support to property in the vicinity of the Contract Site and arising out of or in connection with the Insured Contract (but not in respect of tunneling works) and occurring during the Period of Insurance.

The Limit of Indemnity being limited to **R50,000,000** attributable to one source or original cause

- b. Contract Works SASRIA – Providing physical** loss of or damage to the Works, Temporary Works and materials intended for incorporation in the Works as covered by the underlying Contract Works policy as noted in (a) above due to perils as covered in terms of the SASRIA Contract Works wording as issued by SASRIA SOC.

The Contract Works SASRIA cover excludes consequential or indirect loss or damage of any kind or description whatsoever.

The SASRIA Contract Works policy is limited to **R500,000,000 (Incl VAT)** in the aggregate during the policy period of insurance.

The Contract Works SASRIA policy wording can be obtained from the SASRIA website <http://www.sasria.co.za/> which notes the covers and policy exclusions.

- c. Aviation Liability Insurance** which provides indemnity against legal liability in the event of accidental death of or injury to persons and/or loss of or damage to property (other than the Works the subject matter of this Contract) arising from the execution of the Contract with a limit of indemnity of **R500,000,000** in respect of any one occurrence or series of occurrences consequent on or to one source or original cause.

This insurance is in respect of liability relating to aircrafts.

Design & Construct Professional Indemnity Insurance which provides indemnity against legal liability to pay compensation as a result of any actual or alleged negligent act, error or omission in the performance of the Professional Duties of the insured and arising from the execution of this project. The limit of indemnity under this insurance shall be **R25,000,000 any one occurrence and in the aggregate annually during the policy period ,subject to renewal.**

Where legally liable, the Policy only indemnifies the party for the rectification of the works.

We draw your attention to the fact that the policy, in addition to other exclusions, will specifically exclude:

- failure to meet contractual requirements relating to efficiency, output or durability.

- arising out of the failure by the Insured to meet completion dates
- arising from financial estimates / cost overruns.
- arising from the loss of documents.
- for consequential losses other than cost of re-design, rectification, replacement or material damage as a consequence of the defect.

Professional Duties do not include:

- a) Labour and construction work which would normally be the responsibility of the building or engineering contractor.
- b) Supervision of the construction works usually undertaken by a building or engineering contractor.

8.6.1.2 **The Contractor** shall familiarise itself fully with the details of such insurance effected by the Employer. The Contractor shall comply to all the terms and conditions of the Employer arranged policies and the Contractor shall be deemed to be fully aware of all the conditions, limits, limitations, exclusions/exceptions and deductibles that are contained in the Employer arranged policies. Copies of the Employer arranged policies are obtainable on request from the Employer and if the Contractor is of the opinion that additional insurance is required, such shall be for the Contractors account.

8.6.1.3 The Employer shall pay the premium in connection with the insurances effected by the Employer. The Employer is entitled to all return premiums, dividends, discounts, or adjustments in connection with the insurances effected by the Employer.

8.6.1.4 The Contractor shall not include any premium charges for this insurance except to the extent, which he may deem necessary in his own interests to effect supplementary insurance to the insurance effected by the Employer. The Employer reserves the right to call for full information regarding insurance costs included by the Contractor.

In the event that the Contractor purchases any insurances in addition to those indicated above, the premium and taxes, duties, etc. shall be borne entirely by the contractor.

8.6.1.5 Any further clarification of the scope of cover provided by the Policies arranged by the Employer should be obtained from the Employer.

8.6.1.6 The Contractor and/or any other party who obtains indemnity under the policies effected under 8.6.1.1 shall become liable for the deductibles (first amount payable) which are applicable in respect of each and every occurrence or series of occurrences attributable to one source or cause giving rise to loss or damage or indemnifiable liability. The deductibles applicable to the policies effected under 8.6.1.1 are as follows:

a) Contract Works/Contractors Public Liability/ Removal Of Lateral Support Liability

Unless stated otherwise in the Policy Extensions the Deductibles shall be as follows which will apply in respect of each and every occurrence or series of occurrences arising out of or in connection with any one event giving rise to loss or damage:

Section 1 Of The Policy – Contract Works

In respect of all loss or damage :

- arising out of subsidence, collapse, earth-quake or earth-tremor – R250,000 each and every occurrence.
- arising out of storm (which term shall include rain, wind, tempest or flood) – R500,000 each and every occurrence
- Arising out of theft or malicious damage – R150,000 each and every occurrence.
- arising out of Testing and Commissioning – R250,000 each and every occurrence.
- arising from any other cause not listed in (1a,b) above - R150,000 each and every occurrence.

Section 2 Of The Policy – Contractors Public Liability

R100,000 each and every claim in respect of Property Damage.

Section 3 Of The Policy – Removal Of Lateral Support Liability

R200,000 each and every claim.

b) Contract Works SASRIA

In respect of theft as a result of the SASRIA perils insured - **R25,000** each and every occurrence.

c) Aviation Liability Insurance;

In respect of each and every loss or damage or injury - **US\$250,000**.

d) Design & Construct Professional Indemnity Insurance

In respect of each and every occurrence – **R10,000,000**.

8.6.1.7 In the event of any occurrence which is likely to give rise to a claim under the insurance arranged by the Employer, the Contractor shall:

- In addition to any statutory requirement or other requirements contained in the Contract immediately notify the Employer and the Employer's Insurance Brokers by telephone, mobile phone or email giving the circumstances, nature and an estimate of the loss or damage or liability. The Contractor must also complete the Claim Advice Form (Appendix "A").

The following persons/insurers must be advised immediately on the occurrence of a claim on site or even a possibility of a claim arising due to an incident occurring on site:

Willis South Africa (Pty) Limited:

Alvin Dye
Tel: +27 (0)11 535 5400
M: +27 (0)082 335 9419
alvin.dye@wtwco.com

Charmaine Moreira
D: +27 (0)11 082 8618
M: +27 (0)79 330 5409
charmain.moreira@wtwco.com

Biko Meletse
D: +27 (0)11 082 8744
M: +27 (0)79 886 7920
Biko.meletse@wtwco.com

- b) Preserve damage and make it available for inspection by a representative of the Insurers.
- c) Wherever possible, photographs of damage should be taken.
- d) Inform the police authorities promptly in the event of loss or damage by theft, burglary or any malicious persons(s) for the purpose of recovering any property so lost, discovering the guilty person or persons, and having him, her or them duly prosecuted.
- e) Advise the Insurers of any other insurance(s) which may cover the same loss, damage or injury, or any part thereof.
- f) Give to the Insurers every assistance to enable the Insurers to settle or resist any claim against the Insured, or institute any proceedings;
- g) On completion the Claims Advice Form, the form must be sent to the Employers Insurance Brokers for further action (the original may be emailed to the Employers Insurance Broker). (Please do not remove the Claims Advice Form out of this document. Rather photocopy the form and send the copy to the Employers Insurance Brokers).
- h) The Employer and the employers Insurance brokers / Insurers or their appointed loss adjusters shall have the right to make all and any enquiry's on the Site of the Works or elsewhere as to the cause and results of any such occurrence and the Contractor shall co-operate in carrying out such enquiry's.
- i) The Contractor, Project Managers and Consultants must allow free access to Insurers' assessors for the purpose of investigating and assessing the loss or damage.
- j) The Contractor must not proceed with the making good any off the loss without the prior authorisation of the Insurers.**
- k) The Contractor must keep separate records of the costs involved in making good any loss or damage and these records should be available at all times for inspection by Insurers. Such records should include inter alia the entire cost of labour, materials, transport and equipment.
- l) Where required by the Employer, negotiate the settlement of claims with the Insurer or their appointed loss adjusters through the Employer's Insurance Brokers and shall obtain the Employer's approval of such settlement.
- m) Once the amount of a claim is agreed by the Insurers and the Contractor, an "Agreement of Loss" form must be signed by the Contractor and if required this shall be counter signed by the Employer or the Project Managers.
- n) The proceeds of such claim will, if required by the Employer, be paid net of any Deductible applicable under the policy by the Insurers to the Employer who on receipt thereof will arrange for payment to be made in terms of the Conditions of Contract. In the event that it is agreed by the Employer that such claims payment be made directly to the Contractor, the Contractor shall arrange for the Employer to endorse the "Agreement of Loss" to this effect.

8.6.2 Insurance Effected by the Contractor.

In addition to Clause 8.6.1.1 in respect of the insurances effected by the Employer the following Insurances to be effected by the Contractor:

8.6.2.1

Without limiting the Contractor's obligations, responsibilities and liabilities, the Contractor and Sub-contractor shall maintain at the Contractor's and Subcontractor's expense and where applicable provide as a minimum the following insurances:

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

The Employer shall be named as additional insured and a waiver of subrogation shall be provided to the Employer.

- b) **Contractor's Common Law Liability/ Worker's Compensation Insurance**

The Contractor shall take out and maintain employer's liability insurance with a limit of indemnity of not less than **R20,000,000** and/or workmen's compensation insurance covering personal injury to or death of the employees of the Contractor engaged in connection with the Works to the minimum value required by applicable law.

The Contractor shall procure that its Subcontractors take out and maintain similar insurance in respect of its Subcontractor's personnel performing the Works.

In the event that a claim is made against the Employer in connection with such insurance, the Contractor shall indemnify and hold harmless the Employer against any such claim. The Employer shall be named as additional insured and a waiver of subrogation shall be provided to the Employer.

- c) **Motor Vehicle Liability Insurance** comprising (as a minimum) "Balance of Third Party" Risks including Passenger Liability indemnity with a limit of indemnity of not less than **R5 000 000** for all owned, non-owned, leased and hired vehicles.

- d) **Insurance For Buy-Down Cover Of Employer's Deductibles**

Should the Contractor believe that the Employer effected Contract Works, Public Liability, Removal Of Support Liability, Aviation Liability and Design & Construct Professional Indemnity deductibles as noted in Clause 8.6.1.2 (a),(c) and (d) be considered to be unacceptable to the Contractor, then the Contractor must obtain Buy Down cover for these deductibles to a deductible considered by the Contractor as being acceptable in respect of the works being undertaken.

- e) Where the Contract involves manufacturing and/or fabrication of the Works or parts thereof at premises other than at the Contract Site the Contractor shall satisfy the Employer that all materials and equipment for incorporation in the Works are adequately insured during manufacture and/or fabrication. In the event of the Employer having an insurable interest in such Works during manufacture or fabrication then such interest shall be noted by endorsement to the relevant Policies of Insurance.

Such insurance shall name Employer as an additional insured, and shall be primary to any insurance maintained by the Employer.

- f) **Public Liability** insurances in excess of the Employers Public Liability insurances as stated

under clause 8.6.1.1(a).

- g) **Aviation Liability** insurances in excess of the Employers Aviation Liability insurances as stated under clause 8.6.1.1(c).
- h) **Contractor's Professional Indemnity Insurance** in excess of the Employers Design & Construct Professional Indemnity insurances as stated under clause 1.1(d) and if applicable to cover the deductible that applies to the Employer effected insurance.

i) **Marine Cargo Insurance (If Applicable)**

Cover: Imports of cargo, equipment, goods, plant, machinery and materials ("**Insured Property**") to the site where the Permanent Works will be constructed.

Sum Insured: Not less than the value of the largest single cargo shipment, conveyance or the value in storage, whichever is the greater (CIF plus 10%).

Marine / Air Cargo Insurance covering the Insured Property against all risks of physical loss or damage while in transit by land, sea or air from country of origin anywhere in the world to the site where the Permanent Works will be constructed including loading, or vice versa, from the commencement of the time the insured items are loaded prior leaving the warehouse or factory for shipment to the said site.

The insured parties are the Employer, the Contractor and its Subcontractors, and all their personnel involved in the execution of any Works on the construction site.

j) **Miscellaneous Insurance**

Other insurance as is customary, desirable or necessary to comply with applicable Laws in the Country.

- 8.6.2.2 The insurances to be provided by the Contractor and his Sub-contractor shall be effected with Insurers and on terms approved by the Employer (which approval shall not be unreasonably withheld) and shall be maintained in force for the duration required (including any period of maintenance/defects liability period). The Contractor shall within twenty eight (28) days of commencement of the contract produce to the Employer the relevant Policy or Policies of Insurance.

- 8.6.2.3 In the event that the Contractor or his Sub-contractor receives any notice of cancellation or restrictive modification to the insurance provided to them they shall immediately notify the Employer in writing of such cancellation or restriction and shall advise what action the Contractor or his Sub-contractor will take to remedy such action.

If the Contractor fails to effect and keep in force the insurances referred to then the Employer may effect and keep in force any such insurances and pay such premium or premiums as may be necessary for that purpose and from time to time deduct the amount paid by the Employer from any monies due or which may become due to the Contractor or recover same as a debt from the Contractor.

8.6.2.4 **Sub-Contractors.**

The Contractor shall:

- a) ensure that all potential and appointed Sub-contractors are aware of the whole contents of these Insurance Clauses, and

- b) enforce the compliance by sub contract agreement between the Contractor and Sub-Contractor and where applicable that the Sub Contractor effect similar insurance relating to the insurances required to be effected by the Contractor under Clause 2 (Contractor effected insurances).

APPENDIX A

**CONTRACTORS CLAIMS ADVICE FORM -
THE COMPLETION OF BRAVO TAXIWAY EXTENSION AT KING SHAKA INTERNATIONAL AIRPORT**

Send to : Willis South Africa (Pty) Limited

E-Mail The Following People :

Thabo.mofolo@wtwco.com

Charmain.moreira@wtwco.com

Biko.meletse@wtwco.com

paul.jacobs@wtwco.com

Nokulunga.Masiza@airports.co.za

Represented by :

* (Please provide name of contracting company, site address, telephone numbers and e-mail address).

RE :ACSA : REHABILITATION BRAVO TAXIWAY CONTRACT : CAR/PL/PI : CLAIM

Date of loss : _____

Reported to site agent by : _____ Date : _____

Reported to Insurance Broker by : _____ Date : _____

Locality of Incident _____

How did the loss occur (cause) ?

Details and nature of loss or damage to Contract Works

Details of other property damaged

Names and address of witnesses

Estimated cost of repairs (Separate records of all costs must be kept) R _____

Person whom assessor should contact

Telephone/Mobile Numbers Of Contact Person

Email Address of Contact Person _____

Sub-Clause (2)

If required, the Contractor shall provide proof that he has paid all contributions required in terms of the Compensation for Occupational Injuries and Diseases Act, No 130 of 1993, and that he has complied with the provisions of the Occupational Health and Safety Act, No 85 of 1993 and, in respect of the later Act, shall when called upon to do so, enter into and execute an Agreement as provided under Section 37(2) of said Act. The Agreement shall be in the form included elsewhere in this document.

Add the following new Clause:

“Has failed to execute construction work in accordance with the Contractor’s Health and Safety Plan or without a threat to the health and safety of persons within fourteen (14) days after receiving from the Employer’s Agent written notice of the same.”

Add the following Clause:

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

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

Part 1: Contract Data completed by the Employer

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

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

The Contract Data and General Conditions of Contract shall have precedence over the Drawings, Scope of Work and Standardised Specifications in the interpretation of any ambiguity or inconsistency between these documents.

The following contract specific data, referring to the General Conditions of Contract for Construction Works, Third Edition, 2015, are applicable to this Contract:

Clause

1 GENERAL

1.1.1.13 The Defects Liability Period is **12 months**.

1.1.1.14 The time for achieving Practical Completion is **12 months**.

The time for achieving Practical Completion, from the Date of Access to the Site is 12 months. The special non-working days are included in the above time for achieving practical completion. This duration also includes the procurement of all contractors as part of the Enterprise Development Plan. It is anticipated that the contract will span over at least 1 builders break shut down period. This one builder's break shall not fall within the 12 months for achieving completion. The Contractor, at his/her own discretion, is to make the appropriate time related and general provisions within the preliminary and general section of the BOQ (Section C1.3.1-page C2-9 (Civil Engineering), Preliminary and General page C2-71 (Electrical Engineering) and Preliminary and General page C2-96 (Mechanical Engineering)

1.1.1.15 The Employer is the **Airports Company South Africa Limited**, King Shaka International Airport, represented by the Airport Manager and/or such other person or persons duly authorised thereto by the Employer in writing:

Address to: Airports Company South Africa SOC Limited
King Shaka International Airport
King Shaka Dr, La Mercy
4407

1.1.1.16 The Employer's Agents are Nankhoo Consulting Engineers acting through a director or an official duly authorised thereto in writing.

Address to: Nankhoo Consulting Engineers
1 Sugar Close, Gateway Office Park, Block 1
Umhlanga
4021

1.1.1.26 The Pricing Strategy is a Re-measurement Contract as defined in Subclause 1.1.1.27

3.2.3 The Employer's Agent is required to obtain the specific approval of the Employer before executing any of the following functions or duties:

1. Clause 3.3.1 Nomination of Employer's Agent's Representative
2. Clause 3.3.4 Employer's Agent's authority to delegate
3. Clause 5.8.1 Non-working times
4. Clause 6.3 Variations
5. Clause 5.11.2 Suspension of the Works
6. Clause 5.12.1 Extension of Time for Practical Completion
7. Clause 5.12.4 Acceleration instead of extension of time

5.3.1 The documentation required before commencement with Works execution are:

Health and Safety Plan (Refer to Clause 4.3)
Initial programme (Refer to Clause 5.6)
Security (Refer to Clause 6.2)
Insurance (Refer to Clause 8.6)
Cash flow projection

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

5.4.2 The access and possession of Site shall not be exclusive to the Contractor but as set out in the Site Information.

- 5.8.1** The non-working days and non-working nights as designated in clause A1.2.7.1 of Part C3.6.1. Refer to the working hours as detailed in the Manual of Procedures for Working Airside. (Refer to Volume 5)

The special non-working days are gazetted public holidays falling outside of the year end break and the days on which the contractor grants the majority of his permanent workforce leave around 15 December and the first Monday of the subsequent year (as defined by SAFCEC).

Working Days

Working Days are defined in the contract as any day of the week other than a Sunday, public holiday, or a special non-working day as declared in the contract data. This typically refers to Monday to Saturday, unless stated otherwise.

Non-Working Days

Non-Working Days include:

- Sundays
- Public Holidays as declared under South African law
- Any other day designated as a special non-working day within the contract

However, if the Contractor wishes to utilize Sunday's or Public Holidays, a formal request must be sent to the Employer's Agent. The Contractor must put in his/her request by no later than Wednesday of that same week which will require approval from the Employer's Agent and Employer. No permanent works shall be undertaken on Sunday.

These are days on which no work is scheduled or expected unless otherwise agreed with the Employer or Engineer.

Special Non-Working Days

Special Non-Working Days are additional days that are not ordinarily recognised as non-working (e.g., not Sundays or public holidays) but are explicitly listed or declared as non-working in the Contract Data. These are typically site- or project-specific and could include:

- Airport shutdown days,
- Safety inspection blackout periods
- Days set aside for operational constraints

- 5.13** (i) The penalty for failing to complete the Works is **R60 000,00** per calendar day.
- (ii) The penalty for failing to meet the taxiway or runway opening requirement is **R60 000,00** per occurrence and also any additional expenses as may result from the delay in opening the facility.

5.16.3 The latent defects period is **10 years**.

6.5.1.2.3 The percentage allowances to cover the relevant charges is **10%**.

6.8.2 Contract Price Adjustment

The Contract Price shall be subject to contract price adjustment in accordance with Clause 6.8 of the General Conditions of Contract.

If special materials are specified in the Contract, then the provisions of Clause 6.8.3 of the General Conditions of Contract shall apply to such special materials.

Where applicable, in terms of the foregoing, the value of the certificates issued shall be adjusted in accordance with the Contract Price Adjustment Schedule with the following values:

The value of the certificates issued shall be adjusted in accordance with the Contract Price Adjustment Schedule with the following values:

x =	0.15
a =	0.15
b =	0.35
c =	0.40
d =	0.10

"L" is Consumer Price Index for the area of Durban, Kwa-Zulu Natal.

"F" is the Production Price Index for Diesel oil.

The base date for the purposes of calculating Contract Price Adjustment (CPA) shall be the month prior to the tender closing date.

NOTE: The contract price adjustment factor shall be calculated to six decimal places.

NOTE: If the Contractor notes that there are any other special materials which are not included in Clause 6.8.3: Variation in the cost of special materials, it shall be priced for accordingly at time of tender and Contract Price Adjustment shall be applicable only.

- 6.10.1.5** The percentage advance on materials not yet built into the Permanent Works is **80%** upon proof of ownership.

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

- 6.10.3** Notwithstanding the provision of a performance guarantee in terms of Clause 6.2.1, interim payments to the Contractors shall be subject to a retention by the Employer of an amount of **5%** of the said amounts due to the Contractor. The limit of retention money is **5%** of the Contract Price, including allowances for contingencies and Contract Price Adjustment. A guarantee in lieu of retention **is** permitted.

- 8.6.1.1.2** The value of Plant and materials supplied by the Employer to be included in the insurance sum is **R0,00 (Nil)**.

- 10.5.3** The number of ad-hoc Adjudication Board Members to be appointed is **1 (one)**.

- 10.7.1** Disputes are to be referred for final settlement to arbitration.

Part 2: Data provided by the Contractor

Clause 1.1.1.9:

The name of the Contractor is

Clause 1.2.1.2:

The address of the Contractor is

Physical Address:
.....
.....

Postal Address:
.....
.....

Telephone:
.....
.....

Fax:
.....

Email:

Clause 6.2.1 The security to be provided by the Contractor shall be one of the following:

TYPE OF SECURITY	CONTRACTOR'S CHOICE. INDICATE "YES" OR "NO"
Cash deposit of 10% of the Contract Sum (excluding VAT)	
Performance Guarantee of 10% of the Contract Sum (excluding VAT)	

Clause 6.8.3: Variation in the cost of special materials

SPECIAL MATERIALS		
Each material dealt with as a special material in terms of Clause 4.1 of the Contract Price Adjustment Schedule of the General Conditions of Contract is stated in the list below. The provisions of Subclause 6.8.3 of the General Conditions of Contract shall apply to such special materials. The rates and prices for the special materials shall be furnished by the tenderer, which rates and prices shall not include VAT but shall include all other obligatory taxes and levies.		
Special Material	Source / Supplier	Rate or Price for the base month
Bitumen		
Base Bitumen (type and net content)	Confirmation letter on the suppliers' letterhead with company registration and address details	/ ton *
10/20 Pen Bitumen (net bitumen content)	Ditto	/ ton *
30/50 Pen Bitumen (net bitumen content)	Ditto	/ ton *
50/70 Pen Bitumen (net bitumen content)	Ditto	/ ton *
AE-2 Modified binder (net bitumen content)	Ditto	/ ton *
A-P1 Modified Binder (PG64E-16) (net bitumen content)	Ditto	/ ton *
* Indicate whether the material will be delivered in bulk or in containers. This is to be the Oil Companies Industry Rate. (excluding VAT and discount, but including all other obligatory taxes and levies) When called upon to do so, the tenderer shall substantiate the above rates or prices with acceptable documentary evidence. No Special Materials are to be submitted unless clarified with Employer's Agent (See F.2.11 & F.2.12) Note: Fuel not to be include unless submitted as an alternative tender Change of supplier may be permitted but only upon application to the Engineer with the appropriate letters of supply in compliance to the relevant requirement note in the above table.		

SIGNED ON BEHALF OF TENDERER:

AIRPORTS COMPANY SOUTH AFRICA

KING SHAKA INTERNATIONAL AIRPORT

TENDER NO: KSIA7806/2025/RFP

PROCUREMENT OF A CIDB GRADE 9 CE CONTRACTOR THE COMPLETION OF BRAVO TAXIWAY EXTENSION AT KING SHAKA INTERNATIONAL AIRPORT FOR A PERIOD OF 12 MONTHS

C1.3: PERFORMANCE GUARANTEE (PRO FORMA)

For use with the General Conditions of Contract for Construction Works, Third Edition, 2015.

GUARANTOR DETAILS AND DEFINITIONS

"Guarantor" means:

Physical address:

"Employer" means:

"Contractor" means:

"Employer's Agent" means:

"Works" means:

"Site" means:

"Contract" means: The Agreement made in terms of the Form of Offer and Acceptance and such amendments or additions to the Contract as may be agreed in writing between the parties.

"Contract Sum" means: The accepted amount inclusive of tax of R

Amount in words:

"Guaranteed Sum" means: The maximum aggregate amount of R

Amount in words:

Type of Performance Guarantee: *Fixed*

"Expiry Date" means:

CONTRACT DETAILS

Employer's Agent issues: Interim Payment Certificates, Final Payment Certificate and the Certificate Completion of the Works as defined in the Contract.

1. VARIABLE PERFORMANCE GUARANTEE

- 1.1. Where a Variable Performance Guarantee has been selected, the Guarantor's liability shall be limited during the following periods to diminishing amounts of the Guaranteed Sum as follows:
 - 1.1.1. From and including the date of signing the Performance Guarantee up to and including the date of the interim payment certificate certifying, for the first time, more than 50% of the Contract Sum: R.....
(Amount in Words.....)
 - 1.1.2. From the day following the date of the said interim payment certificate up to and including the Expiry Date, or the date of issue by the Employer's Agent of the Certificate of Completion of the Works, _____ whichever _____ occurs _____ first:
R.....
(Amount in Words.....)
- 1.2. The Employer's Agent and/or the Employer shall advise the Guarantor in writing of the date on which the interim payment certificate certifying, for the first time, more than 50% of the Contract Sum, has been issued and the date on which the Certificate of Completion of the Works has been issued.

2. FIXED PERFORMANCE GUARANTEE

- 2.1. Where a Fixed Performance Guarantee has been selected, the Guarantor's liability shall be limited to the amount of the Guaranteed Sum.
- 2.2. The Guarantor's period of liability shall be from and including the date on which the Performance Guarantee is signed, up to and including the Expiry Date, or the date of issue by the Employer's Agent of the Certificate of Completion of the Works, or the date of payment in full of the Guaranteed Sum, whichever occurs first.
- 2.3. The Employer's Agent and/or Employer shall advise the Guarantor in writing of the date on which the Certificate of Completion has been issued.

3. CONDITIONS APPLICABLE TO VARIABLE AND FIXED PERFORMANCE GUARANTEES

- 3.1. The Guarantor hereby acknowledges that:
 - 3.1.1. Any reference in this Performance Guarantee to the Contract is made for the purpose of convenience and shall not be construed as any intention whatsoever to create an accessory obligation or any intention whatsoever to create a suretyship;
 - 3.1.2. Its obligation under this Performance Guarantee is restricted to the payment of money.
- 3.2. Subject to the Guarantor's maximum liability referred to in 1.1 or 2.1, the Guarantor hereby undertakes to pay the Employer the sum certified upon receipt of the documents identified in 3.2.1 to 3.2.3:

- 3.2.1. A copy of a first written demand issued by the Employer to the Contractor stating that payment of a sum certified by the Engineer 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, the Employer intends to call upon the Guarantor to make payment in terms of 3.2.2;
- 3.2.2. A first written demand issued by the Employer to the Guarantor at the Guarantor's physical address with a copy to the Contractor stating that a period of seven (7) days has elapsed since the first written demand in terms of 3.2.1 and the sum certified has still not been paid;
- 3.2.3. A copy of the aforesaid payment certificate which entitles the Employer to receive payment in terms of the Contract of the sum certified in 3.2.
- 3.3. Subject to the Guarantor's maximum liability referred to in 1.1 or 2.1, the Guarantor undertakes to pay to the Employer the Guaranteed Sum or the full outstanding balance upon receipt of a first written demand from the Employer to the Guarantor at the Guarantor's physical address calling up this Performance Guarantee, such demand stating that:
 - 3.3.1. The Contract has been terminated due to the Contractor's default and that this Performance Guarantee is called up in terms of 3.3; or
 - 3.3.2. A provisional or final sequestration or liquidation court order has been granted against the Contractor and that the Performance Guarantee is called up in terms of 3.3; and
 - 3.3.3. The aforesaid written demand is accompanied by a copy of the notice of termination and/or the provisional/final sequestration and/or the provisional liquidation court order.
- 3.4. It is recorded that the aggregate amount of payments required to be made by the Guarantor in terms of 4 and 5 shall not exceed the Guarantor's maximum liability in terms of 1.1 or 2.1.
- 3.5. Where the Guarantor has made payment in terms of 3.3, the Employer shall upon the date of issue of the Final Payment Certificate submit an expense account to the Guarantor showing how all monies received in terms of this Performance Guarantee have been expended and shall refund to the Guarantor any resulting surplus. All monies refunded to the Guarantor in terms of this Performance Guarantee shall bear interest at the prime overdraft rate of the Employer's bank compounded monthly and calculated from the date payment was made by the Guarantor to the Employer until the date of refund.
- 3.6. Payment by the Guarantor in terms of 3.2 or 3.3 shall be made within seven (7) calendar days upon receipt of the first written demand to the Guarantor.
- 3.7. Payment by the Guarantor in terms of 3.3 will only be made against the return of the original Performance Guarantee by the Employer.
- 3.8. The Employer shall have the absolute right to arrange his affairs with the Contractor in any manner which the Employer may deem fit and the Guarantor shall not have the right to claim his release from this Performance Guarantee on account of any conduct alleged to be prejudicial to the Guarantor.
- 3.9. The Guarantor chooses the physical address as stated above for the service of all notices for all purposes in connection herewith.
- 3.10. This Performance Guarantee is neither negotiable nor transferable and shall expire in terms of 1.1.2 or 2.2, where after no claims will be considered by the Guarantor. The original of this Guarantee shall be returned to the Guarantor after it has expired.
- 3.11. This Performance Guarantee, with the required demand notices in terms of 3.2 or 3.3, shall be regarded as a liquid document for the purposes of obtaining a court order.
- 3.12. Where this Performance Guarantee is issued in the Republic of South Africa the Guarantor hereby consents in terms of Section 45 of the Magistrate's Courts Act No 32 of 1944, as

amended, to the jurisdiction of the Magistrate's Court of any district having jurisdiction in terms of Section 28 of the said Act, notwithstanding that the amount of the claim may exceed the jurisdiction of the Magistrate's Court.

Signed at:

Date:

Guarantor's signatory (1):

Capacity:

Guarantor's signatory (2):

Capacity:

Witness signatory (1):

Witness signatory (2):

AIRPORTS COMPANY SOUTH AFRICA

KING SHAKA INTERNATIONAL AIRPORT

TENDER NO: KSIA7806/2025/RFP

PROCUREMENT OF A CIDB GRADE 9 CE CONTRACTOR THE COMPLETION OF BRAVO TAXIWAY
EXTENSION AT KING SHAKA INTERNATIONAL AIRPORT FOR A PERIOD OF 12 MONTHS

C1.4: RETENTION MONEY GUARANTEE (PRO FORMA)

ISSUED TO [INSERT NAME OF
EMPLOYER] (hereinafter called "the Employer")

ON BEHALF OF [INSERT NAME OF
CONTRACTOR] (hereinafter called "the Contractor")

in connection with TENDER NO: (hereinafter called "the Contract").

WHEREAS the Employer and the Contractor have agreed that the Contractor may provide a guarantee in lieu of the whole or a portion of the retention moneys provided for under the Contract;

NOW THEREFORE we, the undersigned, undertake, in accordance with the following provisions, to pay to the Employer such amounts as the Employer may, from time to time, demand from us.

1. Each demand by the Employer shall be in writing, signed by the Employer and delivered to us at [INSERT GUARANTOR'S FULL STREET ADDRESS] or such other address in [INSERT NAME OF COUNTRY] as we shall in writing notify to the Employer, and shall be accompanied by a certificate complying with Clause 2, signed by the Employer's Agent in office as such in terms of the Contract.
2. The Employer's Agent's certificate referred to in Clause 1 shall certify that:
 - (a) he is the Employer's Agent in office as such in terms of the Contract,
 - (b) the Contractor is in breach of his obligations under the Contract, and
 - (c) the amount demanded, which amount the certificate shall specify, does not exceed
 - (i) the amount of retention moneys which, but for this guarantee, would have been retained by the Employer in terms of the Contract at the date of the certificate, less the aggregate of the amounts of retention money actually retained by the Employer and the amounts previously paid by us to the Employer in terms hereof,
 - (ii) a genuine estimate of the cost to the Employer of having the breach referred to in paragraph (b) remedied less the aggregate of any amounts withheld by the Employer from payments due to the Contractor in terms of the Contract by reason of the breach referred to, and any amount of retention money actually held by the Employer save to the extent that the same had been deducted from any previous demand in terms hereof;

3. We shall within days after our receipt of a demand complying with the provisions in Clauses 1 and 2 make payment to the Employer of the amount demanded at *[INSERT EMPLOYER'S STREET ADDRESS]* or at such other address in *[INSERT EMPLOYER'S COUNTRY]* as the Employer shall in writing notify to us.
4. Subject to compliance with the provisions hereof, our liability to make the payments herein referred to shall be unconditional and shall not be affected or diminished by any disputes, claims or counterclaims between the Employer and the Contractor.
5. Our aggregate liability under this guarantee is limited to*[INSERT AMOUNT OF GUARANTEE IN WORDS]* (R..... *[INSERT AMOUNT OF GUARANTEE IN FIGURES]*).
6. This guarantee shall expire on the date on which the last of the retention moneys, which but for this guarantee would have been retained by the Employer, becomes payable to the Contractor.
7. This guarantee is not transferable and must be produced for endorsement if any part payment is made and must be returned to us against final payment of our aggregate liability or on the date of the expiry of the guarantee in terms of Clause 6, whichever is the earlier.

Signed in the presence of the subscribing witnesses:

Atfor and on behalf of

.....

on this the day of 20.....

SIGNATURE :

CAPACITY :

ADDRESS :

:

:

AS WITNESSES : 1

2

AIRPORTS COMPANY SOUTH AFRICA

KING SHAKA INTERNATIONAL AIRPORT

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PROCUREMENT OF A CIDB GRADE 9 CE CONTRACTOR THE COMPLETION OF BRAVO TAXIWAY
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C1.5: ADJUDICATOR'S AGREEMENT (Pro Forma Form)

This agreement is made on the day of between:

.....[*name of company/organisation*]

of

.....[*address*] and

.....[*name of company/organisation*]

of

.....[*address*]

(the Parties) and

.....[*name*]

of

.....[*address*]

(the Adjudicator).

Disputes or differences may arise/have arisen* between the Parties under a Contract dated

..... and known as

.....

and these disputes or differences shall be/have been* referred to adjudication in accordance with the
CIDB Adjudication Procedure [*hereinafter called "the Procedure"*], and the Adjudicator may be or has
been requested to act.

**Delete as necessary.*

IT IS NOW AGREED as follows:

1. The rights and obligations of the Adjudicator and the Parties shall be as set out in the Procedure.
2. The Adjudicator hereby accepts the appointment and agrees to conduct the adjudication in accordance with the Procedure.
3. The Parties bind themselves jointly and severally to pay the Adjudicator's fees and expenses in accordance with the Procedure as set out in the Contract Data.
4. The Parties and the Adjudicator shall at all times maintain the confidentiality of the adjudication and shall endeavour to ensure that anyone acting on their behalf or through them will do likewise, save with the consent of the other Parties which consent shall not be unreasonably refused.
5. The Adjudicator shall inform the Parties if he intends to destroy the documents which have been sent to him in relation to the adjudication and he shall retain documents for a further period at the request of either Party.

SIGNED BY: _____	SIGNED BY _____	SIGNED BY _____
Name: _____	Name: _____	Name: _____
who warrants that he/she is duly authorised to sign for and on behalf of the first Party in the presence of	who warrants that he/she is duly authorised to sign for on behalf of the second Party in the presence of	the Adjudicator in the presence of
Witness: _____	Witness: _____	Witness: _____
Name: _____	Name: _____	Name: _____
Address: _____ _____ _____ _____	Address: _____ _____ _____ _____	Address: _____ _____ _____ _____
Date: _____	Date: _____	Date: _____

Contract Data

1. The Adjudicator shall be paid at the hourly rate of R..... in respect of all time spent upon, or in connection with, the adjudication including time spent travelling.
 2. The Adjudicator shall be reimbursed in respect of all disbursements properly made including, but not restricted to:
 - (a) Printing, reproduction and purchase of documents, drawings, maps, records and photographs
 - (b) Telegrams, telex, faxes and telephone calls
 - (c) Postage and similar delivery charges
 - (d) Travelling, hotel expenses and other similar disbursements
 - (e) Room charges
 - (f) Charges for legal or technical advice obtained in accordance with the Procedure.
 3. The Adjudicator shall be paid an appointment fee of R..... This fee shall become payable in equal amounts by each Party within 14 days of the appointment of the Adjudicator, subject to an invoice being provided. This fee will be deducted from the final statement of any sums which shall become payable under item 1 and/or item 2 of the Contract Data. If the final statement is less than the appointment fee the balance shall be refunded to the Parties.
 4. The Adjudicator is/is not* currently registered for VAT.
- *Delete as necessary*
5. Where the Adjudicator is registered for VAT it shall be charged additionally in accordance with the rates current at the date of invoice.
 6. All payments, other than the appointment fee (item 3) shall become due 7 days after receipt of invoice, thereafter interest shall be payable at 5% per annum above the Reserve Bank base rate for every day the amount remains outstanding.

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KING SHAKA INTERNATIONAL AIRPORT

TENDER NO: KSIA7806/2025/RFP

PROCUREMENT OF A CIDB GRADE 9 CE CONTRACTOR THE COMPLETION OF BRAVO TAXIWAY
EXTENSION AT KING SHAKA INTERNATIONAL AIRPORT FOR A PERIOD OF 12 MONTHS

**C1.6: AGREEMENT IN TERMS OF THE OCCUPATIONAL HEALTH AND SAFETY
ACT, 1993 (ACT NO 85 OF 1993)**

THIS AGREEMENT made at

on this the day of in the year

between [hereinafter called "the Employer"] of the one

part, herein represented by

in his capacity as

and

[hereinafter called "the Mandatary"] of the other part, herein represented by

.....

in his capacity as

WHEREAS the Employer is desirous that certain works be constructed, viz PROCUREMENT OF A CIDB GRADE 9 CE CONTRACTOR THE COMPLETION OF BRAVO TAXIWAY EXTENSION AT KING SHAKA INTERNATIONAL AIRPORT FOR A PERIOD OF 12 MONTHS and has accepted a Tender by the Mandatary for the construction, completion and maintenance of such Works and whereas the Employer and the Mandatary have agreed to certain arrangements and procedures to be followed in order to ensure compliance by the Mandatary with the provisions of the Occupational Health and Safety Act, 1993 (Act 85 of 1993);

NOW THEREFORE THIS AGREEMENT WITNESSETH AS FOLLOWS:

1. The Mandatary shall execute the work in accordance with the Contract Documents pertaining to this Contract.
2. This Agreement shall hold good from its Commencement Date, which shall be the date of a written notice from the Employer or Employer's Agent requiring him to commence the execution of the Works, to either
 - (a) the date of the Final Approval Certificate issued in terms of Clause 5.16.1 of the General Conditions of Contract [hereinafter referred to as "the GCC"], or
 - (b) the date of termination of the Contract in terms of Clauses 9.1, 9.2 or 9.3.
3. The Mandatary declares himself to be conversant with the following:

- (a) All the requirements, regulations and standards of the Occupational Health and Safety Act, 1993 (Act No 85 of 1993), hereinafter referred to as "The Act", together with its amendments and with special reference to the following sections of The Act:
 - (i) Section 8 : General duties of employers to their employees;
 - (ii) Section 9 : General duties of employers and self-employed persons to persons other than employees;
 - (iii) Section 37 : Acts or omissions by employees or mandataries, and
 - (iv) Subsection 37(2) relating to the purpose and meaning of this Agreement.
 - (b) The procedures and safety rules of the Employer as pertaining to the Mandatary and to all his subcontractors.
4. In addition to the requirements of Clause 8.4 of the GCC and all relevant requirements of the Contract, the Mandatary agrees to execute all the Works forming part of this Contract and to operate and utilise all machinery, plant and equipment in accordance with the Act.
 5. The Mandatary is responsible for the compliance with the Act by all his subcontractors, whether or not selected and/or approved by the Employer.
 6. The Mandatary warrants that all his and his subcontractors' workmen are covered in terms of the Compensation for Occupational Injuries and Diseases Act, 1993 which cover shall remain in force whilst any such workmen are present on site. A letter of good standing from the Compensation Commissioner to this effect must be produced to the Employer upon signature of the agreement.
 7. The Mandatary undertakes to ensure that he and/or subcontractors and/or their respective employers will at all times comply with the following conditions:
 - (a) The Mandatary shall assume the responsibility in terms of Section 16.1 of the Occupational Health and Safety Act. The Mandatary shall not delegate any duty in terms of Section 16.2 of this Act without the prior written approval of the Employer. If the Mandatary obtains such approval and delegates any duty in terms of Section 16.2 a copy of such written delegation shall immediately be forwarded to the Employer.
 - (b) All incidents referred to in the Occupational Health and Safety Act shall be reported by the Mandatary to the Department of Labour as well as to the Employer. The Employer will further be provided with copies of all written documentation relating to any incident.
 - (c) The Employer hereby obtains an interest in the issue of any formal inquiry conducted in terms of Section 32 of the Occupational Health and Safety Act into any incident involving the Mandatary and/or his employees and/or his subcontractors.

In witness thereof the parties hereto have set their signatures hereon in the presence of the subscribing witnesses:

SIGNED FOR AND ON BEHALF OF THE EMPLOYER:

WITNESS 1 2

NAME 1 2
(IN CAPITALS)

SIGNED FOR AND ON BEHALF OF THE MANDATARY:

WITNESS 1 2

NAME 1 2
(IN CAPITALS)

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

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

An example is given below:

"By resolution of the Board of Directors passed at a meeting held on 20.....,

Mr/Ms whose signature

appears below, has been duly authorised to sign the AGREEMENT in terms of THE OCCUPATIONAL

HEALTH AND SAFETY ACT, 1993 (ACT NO 85 OF 1993) on behalf of

.....

SIGNED ON BEHALF OF THE COMPANY :

IN HIS/HER CAPACITY AS :

DATE :

SIGNATURE OF SIGNATORY :

WITNESS: 1. 2.

NAME (IN CAPITALS): 1. 2.



AIRPORTS COMPANY SOUTH AFRICA

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C2: Pricing Data

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C2.1: PRICING INSTRUCTIONS

1. Measurement and payment shall be in accordance with the relevant provisions of the COTO Standard Specifications for Road and Bridge Works for South African Road Authorities (2020 edition) as amended in the Scope of Works.
2. The units of measurement described in these Bills of Quantities are metric units. Abbreviations used in these Bills of Quantities are as follows:

%	=	percent
h	=	hour
ha	=	hectare
kg	=	kilogram
kl	=	kilolitre
km	=	kilometre
km-pass	=	kilometre-pass
kPa	=	kilopascal
kW	=	kilowatt
l	=	litre
ls	=	Lump sum
m	=	metre
mm	=	millimetre
m ²	=	square metre
m ² -pass	=	square metre-pass
m ³	=	cubic metre
m ³ -km	=	cubic metre-kilometre
MN	=	meganewton
MN.m	=	meganewton-metre
MPa	=	megapascal
No.	=	number
Prov sum	=	Provisional sum
PC sum	=	Prime Cost sum
R/only	=	Rate only
sum	=	lump sum
t	=	ton (1 000 kg)
W/day	=	Work day

3. For the purpose of these Bills of Quantities, the following words shall have the meanings hereby assigned to them:

Unit:	The unit of measurement for each item of work as defined in the The COTO Standard Specifications for Road and Bridge Works for South African Road Authorities (2020 edition).
Quantity:	The number of units of work for each item.
Rate:	The agreed payment per unit of measurement.
Amount:	The product of the quantity and the agreed rate for an item.
Lump sum:	An agreed amount for an item, the extent of which is described in the Bills of Quantities but the quantity of work of which is not measured in any units.
4. Unless otherwise stated, items are measured net in accordance with the drawings, and no allowance is made for waste.
5. It will be assumed that prices included in the bills of quantities 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.sabs.co.za, or www.iso.org for information on standards)
6. The prices and rates in these Bills of Quantities are fully inclusive prices for the work described under the items. Such prices and rates cover all costs and expenses that may be required in and for the execution of the work described in accordance with the provisions of the Scope of Work, and shall cover the cost of all general risks, liabilities, and obligations set forth or implied in the Contract Data, as well as overhead charges and profit. These prices will be used as a basis for assessment of payment for additional work that may have to be carried out.
7. Where the Scope of Work requires detailed drawings and designs or other information to be provided, all costs associated therewith are deemed to have been provided for and included in the unit rates and sum amount tendered such items
8. An item against which no price is entered will be considered to be covered by the other prices or rates in the Bills of Quantities. Each item in the Bill of Quantities must be priced individually.
9. The quantities set out in these Bills of Quantities are approximate and do not necessarily represent the actual amount of work to be done. The quantities of work accepted and certified for payment will be used for determining payments due and not the quantities given in these Bills of Quantities.
10. Reasonable compensation will be received where no pay item appears in the Bills of Quantities in respect of work required in terms of the Contract and which is not covered in any other pay item.
11. The short descriptions of the items of payment given in these Bills of Quantities are only for the purposes of identifying the items. More details regarding the extent of the work entailed under each item appear in the Scope of Work.
12. The item numbers appearing in the Bills of Quantities refer to the corresponding item numbers in the COTO Standard Specifications for Road and Bridge Works for South African Road Authorities (2020 edition) for Civils work. The items and numbering appearing in the Bills of Quantities for Mechanical and Electrical Work shall be referenced to the detailed specification in the Document.
13. The contractor shall determine the contract skills participation goals, expressed in Rand, which shall not be less than the contract amount multiplied by a percentage factor given in Table 2 in the Standard for the applicable class of construction works. This is indicated by the percentage factor in the Final Tender Summary section. Minimum Contract Skills Development Goal (CSDG) sum = Civil Engineering CE (0.25%) x Subtotal of the tender amount
14. All handling fees with respect to Provisional Sums and Prime Cost Sum shall be capped at a maximum amount of 7.5%.
15. An Electronic Bill of Quantities will be provided to all bidders. It is the responsibility of the bidder to ensure all items, quantities and formulas are correct on the Electronic Bill of Quantities. The Bill of

Quantities on Section C2.2 of the Contract shall be binding and must be completed within the Contract Document.

16. All rates which are provided by bidders in Section C2.2 for all Civil, Electrical and Mechanical works are binding and shall be unchanged throughout the duration of the project. Rates from Section C2.2 Bill of Quantities shall be used for any Variation Order which may arise.



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C2.2: BILL OF QUANTITIES

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**SCHEDULE A: PRELIMINARY AND GENERAL
C1.2: GENERAL REQUIREMENTS AND PAYMENT**

ITEM	DESCRIPTION	UNIT	LI	QUANTITY	RATE	AMOUNT
C1.2	GENERAL REQUIREMENTS AND PAYMENT					
	NOTE TO THE CONTRACTOR: THE FOLLOW CHAPTER SHALL BE APPLICABLE TO ALL SCOPE OR WORKS - CIVIL, ELECTRICAL AND MECHANICAL					
PSC1.2.1	Environmental Management					
PSC1.2.1.1	Monitoring of compliance with and reporting on the EMP	Month		12		
PSC1.2.1.2	Dedicated environmental officer	Month		12		
PSC1.2.2	Programming and Reporting					
PSC1.2.2.3	Submission of a Scheme 2 Initial Programme	Lump Sum		1		
PSC1.2.2.4	Submission of a Scheme 2 Full Programme	Lump Sum		1		
PSC1.2.2.5	Reviewing and updating a Scheme 2 Programme every month	Month		12		
PSC1.2.2.6	Preparation and submission of all information and reports specified in the Contract Documentation	Month		12		
PSC1.2.5	Safety					
PSC1.2.5.1	Health and safety plan	Lump Sum		1		
PSC1.2.5.2	Implementation of health and safety plan	Month		12		
PSC1.2.5.3	Provision of full time Construction Safety Officer	Month		12		
PSC1.2.10	Community Participation					
(a)	Cost for Community Participation (PLC and CLO)	Month		12		
PSC 1.2.11	Provision for Aviation Specialist	PC Sum		1 100 000	1	1 100 000
(a)						
PSC 1.2.11	Handling costs and profit in respect of sub-item PSC 1.2.11 (a) above (Capped at 7.5%)	%		1 100 000		
(b)						
PSC 1.2.12	Provision for Rehabilitation of sensitive areas	PC Sum		350 000	1	350 000
(a)						
PSC 1.2.12	Handling costs and profit in respect of sub-item PSC 1.2.12 (a) above (Capped at 7.5%)	%		350 000		
(b)						
TOTAL CARRIED FORWARD						

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SCHEDULE A: PRELIMINARY AND GENERAL
C1.2: GENERAL REQUIREMENTS AND PAYMENT

ITEM	DESCRIPTION	UNIT	LI	QUANTITY	RATE	AMOUNT
	TOTAL BROUGHT FORWARD					
PSC1.2.13	Airside induction courses and permits - To include all permits (Personal, Vehicle and Plant), inductions, Airside Training, Parking Cards and required works permits. Control of Dust and FOD pollution on the runways, taxiways, taxi lanes, services roads, aprons, haul and site access road and campsites/site office	Lump Sum		1		
PSC1.2.14		Lump Sum		1		
PSC1.2.15	Security requirements at the Contractors Gate and Camp site	Month		12		
PSC 1.2.16	As-built Survey	Lump Sum		1		
PSC1.2.17	Material As-Builts	Lump Sum		1		
PSC1.2.18	Management and Implementation of CPG Requirements	Month		12		
PSC1.2.19	Management and Implementation of CIDB B.U.I.L.D program	Month		12		
PSC1.2.20	Penalty to be deducted for non-compliances with requirements for accommodation of traffic as per COTO Section 1.5, ACSA Specific Regulations and Volume 5 Manual of Procedures for Working Airside					
(a)	Fixed penalty per occurrence	No		1	(50 000)	Rate Only
(b)	Time related penalty	Hour		1	(10 000)	Rate Only
PSC1.2.21	Penalty to be deducted for non-compliances with Environmental Specification, ACSA Specific Regulations and Volume 5 Manual of Procedures for Working Airside per Occurrence					
(a)	Fixed penalty per occurrence	No		1	(10 000)	Rate Only
PSC1.2.22	Penalty to be deducted for non-compliances with OHS-Act, Construction Regulations, ACSA Specific Regulations and Volume 5 Manual of Procedures for Working Airside per Occurrence					
(a)	Fixed penalty per occurrence	No		1	(10 000)	Rate Only
PSC1.2.23	Penalty to be deducted for non-compliances with Volume 5 Manual of Procedures for Working Airside per Occurrence					
(a)	Fixed penalty per occurrence	No		1	(10 000)	Rate Only
PSC1.2.24 (a)	Provision for Independent Health and Safety (OHS) and Environmental Management (ENV)	Prov Sum		2 500 000	1	2 500 000
PSC1.2.24 (b)	Handling costs and profit in respect of sub-item PSC 1.2.24 (a) above (Capped at 7.5%)			2 500 000	%	
TOTAL CARRIED FORWARD TO SUMMARY						

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SCHEDULE A: PRELIMINARY AND GENERAL

C1.3: CONTRACTOR'S SITE ESTABLISHMENT AND GENERAL OBLIGATIONS

ITEM	DESCRIPTION	UNIT	LI	QUANTITY	RATE	AMOUNT
C1.3	CONTRACTOR'S SITE ESTABLISHMENT AND GENERAL OBLIGATIONS					
C1.3.1	The Contractor's general obligations					
C1.3.1.1	Fixed obligations	Lump Sum		1		
C1.3.1.3	Time-related obligations	Month		12		
	NOTE TO THE CONTRACTOR: THE FOLLOW PAY ITEM BELOW PSC1.3.1.4 SHALL BE APPLICABLE TO ALL SCOPE OR WORKS - CIVIL, ELECTRICAL AND MECHANICAL					
PSC1.3.1.4	Suspension Cost					
(a)	(a) De-establishment	No		1		
(b)	(b) Re-establishment	No		1		
(c)	(c) Suspension period	Month		3		
(d)	(d) Engineer's cost	PC Sum		300 000	1	300 000
C1.3.2	Contract sign boards	m ²		24		
TOTAL CARRIED FORWARD TO SUMMARY						

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SCHEDULE A: PRELIMINARY AND GENERAL
C1.4: FACILITIES FOR THE ENGINEER

ITEM	DESCRIPTION	UNIT	LI	QUANTITY	RATE	AMOUNT
C1.4	FACILITIES FOR THE ENGINEER NOTE TO THE CONTRACTOR: THE FOLLOW CHAPTER SHALL BE APPLICABLE TO ALL SCOPE OR WORKS - CIVIL, ELECTRICAL AND MECHANICAL					
C1.4.1	Site accommodation					
C1.4.1.1	Offices and conference room	m ²		125		
C1.4.1.6	Car ports	No		3		
C1.4.1.7	Ablution unit	No		3		
C4.4.1.9	Kitchen unit	No		1		
C1.4.2	Items measured by area					
C1.4.2.1	Shelving as specified, complete with brackets	m ²		6		
C1.4.2.8	Notice boards	m ²		3		
C1.4.3	Items measured by number					
C1.4.3.1	Office swivel chair	No		4		
C1.4.3.2	Office chair	No		15		
C1.4.3.5	Office desk with 3 drawers (at least one lockable drawer)	No		4		
C1.4.3.7	Drawing table	No		2		
C1.4.3.8	Conference table	No		1		
C1.4.3.10	Filing cabinet	No		1		
C1.4.3.11	General purpose steel cabinet with shelves	No		2		
C1.4.3.13	220/250-volt power outlet plug point	No		10		
C1.4.3.15	Single 1 500 mm, 58-watt fluorescent tube ceiling light	No		10		
C1.4.3.17	11-watt compact fluorescent bulb ceiling light	No		4		
C1.4.3.23	Fire extinguisher 9,0 kg, dry powder type	No		2		
C1.4.3.24	Air-conditioning unit	No		2		
C1.4.3.29	A3 / A4 colour printer, copier, scanner	No		1		
C1.4.3.31	Rain gauge	No		1		
TOTAL CARRIED FORWARD						

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SCHEDULE A: PRELIMINARY AND GENERAL
C1.4: FACILITIES FOR THE ENGINEER

ITEM	DESCRIPTION	UNIT	LI	QUANTITY	RATE	AMOUNT
TOTAL BROUGHT FORWARD						
C1.4.3.35	3,0m aluminium straight edge complete with two measuring wedges	No		1		
C1.4.3.37	First aid kit	No		3		
PSC1.4.3.39	ACSA approved lime coloured reflective safety jackets (With lettering)	No		12		
PSC1.4.3.40	Rechargeable 500 000 candlelight halogen lamps	No		8		
PSC1.4.3.41	Two-way handheld radio VHF/AM Dittel FSG5 complete with charger, carrying bag with strap and vehicle magnetic antenna including adapter cable - Compliant with ACSA approved frequency.	No		10		
PSC1.4.3.42	Supply and install ACSA Approved metres for water and electricity	No		6		
C1.4.4	Prime cost items					
C1.4.4.1	Cell phones costs, including pro-rata rentals, for calls made in connection with contract administration	PC Sum		42 000	1	42 000
C1.4.4.2	Handling costs and profit in respect of item C1.4.4.1 (Capped at 7.5%)	%		42 000		
C1.4.4.5	The provision of internet connectivity and Wi-Fi data for Engineer's site staff	PC Sum		12 000	1	12 000
C1.4.4.6	Handling costs and profit in respect of item C1.4.4.5 (Capped at 7.5%)	%		12 000		
C1.4.4.7	The provision of paper and ink for a combination colour printer/copier/scanner	PC Sum		30 000	1	30 000
C4.4.8	Handling costs and profit in respect of item C1.4.4.7	%		30 000		
C1.4.5	Services at site offices, laboratories and site accommodation					
C1.4.5.1	Fixed costs	Lump Sum		1		
C1.4.5.2	Running costs	Month		12		
C1.4.6	Office Staff					
C1.4.6.1	Secretary/Receptionist	Month		12		
C1.4.6.2	Technical assistant	Month		12		
TOTAL CARRIED FORWARD TO SUMMARY						

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SCHEDULE A: PRELIMINARY AND GENERAL
C1.5: ACCOMMODATION OF TRAFFIC

ITEM	DESCRIPTION	UNIT	LI	QUANTITY	RATE	AMOUNT
C1.5	ACCOMMODATION OF TRAFFIC					
	NOTE TO THE CONTRACTOR: THE FOLLOW CHAPTER SHALL BE APPLICABLE TO ALL SCOPE OR WORKS - CIVIL, ELECTRICAL AND MECHANICAL					
PSC1.5.1	Accommodation of pedestrian and non-motorised traffic					
PSC1.5.1.1	Accommodation of pedestrian and non-motorised traffic	Month		12		
PSC1.5.2	Accommodation of vehicular traffic	Month		12		
C1.5.3	Liaison with traffic authorities	Month		12		
C1.5.4 C1.5.4/C4.4.2 (j)	Construction of temporary deviations Pavement layer material Type G7 Material	m ³		2 000		
C1.5.4/C5.3.2.1 (g)	Construction of layers using conventional construction methods: Gravel wearing course layer (layer thickness indicated) compacted to 95% of MDD	m ³		2 000		
C1.5.5 C1.5.5.9	Maintenance of temporary deviations Grading of temporary deviations and existing roads used as detours	km		8		
C1.5.5.10	Watering of temporary deviations and existing roads used as detours	kl		1 500		
C1.5.5.11	Other road maintenance work ordered by the Engineer	Prov Sum		200 000	1	200 000
C1.5.5.12	Handling cost, profit and all other charges in respect of item C1.5.5.12 (Capped at 7.5%)	%		200 000		
C1.5.7 C1.5.7.1	Temporary traffic control facilities Delineators including mounting bases and ballast:					
(a)	Single sided, reversible left or right (size indicated)	No		350		
(b)	Double sided, reversible left or right (size indicated)	No		150		
C1.5.7.2	Traffic cones, minimum height 750 mm	No		150		
C1.5.7.3	Flagmen	Man-shift	LI	1 056		
TOTAL CARRIED FORWARD						

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SCHEDULE A: PRELIMINARY AND GENERAL
C1.5: ACCOMMODATION OF TRAFFIC

ITEM	DESCRIPTION	UNIT	LI	QUANTITY	RATE	AMOUNT
TOTAL BROUGHT FORWARD						
C1.5.7.4	Traffic Controllers	Man-Shift		1		Rate Only
C1.5.7.5	Provision of illuminated traffic signs					
(a)	Sign mounted flashing amber lights (2 lights with the specified power supply) mounted on a backing board which is					
(i)	900 mm wide x 150 mm high	No		4		
(ii)	1 200 mm wide x 200 mm high	No		2		
(b)	Flashing LED illuminated arrow board	No		4		
(c)	Illuminated road sign – R & TR series	No		15		
(d)	Illuminated road sign – TW series	No		15		
C1.5.7.6	Maintenance of illuminated traffic signs:					
(a)	Sign mounted flashing amber lights (a pair of two lights mounted on a separate backing board)	Month		6		
(b)	Flashing LED illuminated arrow board	Month		4		
(c)	Illuminated road sign – R & TR series	Month		15		
(d)	Illuminated road sign – TW series	Month		15		
C1.5.7.9	Cleaning of traffic control facilities	Month		12		
C1.5.11	Provision of safety equipment for visitors					
C1.5.11.1	Provision of reflective safety vests for visitors	No		15		
C1.5.8	Traffic safety officer	Man-month		12		
C1.5.9	Traffic safety vehicle	Month		12		
C1.5.12	Additional traffic accommodation facilities ordered by the Engineer:					
C1.5.12.1	Provision of additional traffic accommodation facilities	Prov Sum		250 000	1	250 000
C1.5.12.2	Handling cost, profit and all other charges in respect of item C1.5.12.1 (Capped at 7.5%)	%		250 000		
TOTAL CARRIED FORWARD						

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SCHEDULE A: PRELIMINARY AND GENERAL
C1.5: ACCOMMODATION OF TRAFFIC

ITEM	DESCRIPTION	UNIT	LI	QUANTITY	RATE	AMOUNT
	TOTAL BROUGHT FORWARD					
PSC1.5.13	Safety Barriers:					
(a)	Provide HDPE plastic mobile road safety barrier, NJ type (2.0m x 1.0m high) taped with yellow reflective tape, two strips on either side	No		20		
(b)	Placing, moving and final removal of HDPE NJ type barriers upon completion of the works	Lump Sum		1		
(c)	Provide precast concrete temporary barrier, NJ type (2.0m x 0.8m high with 0.6m base) taped with yellow reflective tape, two strips on either side and with two amber flashing lights mounted on each barrier	No		4		
(d)	Placing, moving and final removal of concrete barriers upon completion of the apron works	Lump Sum		1		
(e)	Provide Taxiway/Runway closure barriers as per drawing complete KSIA-CIV-PP-033	No		6		
(f)	Placing, moving and final removal of taxiway/runway closure barriers upon completion of the works	Lump Sum		1		
(g)	Provision for temporary construction wooden fencing - Bravo Taxi Way, Greenfield Area, Apron Stand as per detailed drawing KSIA-CIV-SD-032C	Lump Sum		1		
PSC1.5.14	Provision of lighting on site for works areas during night work or where instructed	Lump Sum		1		
PSC1.5.15	Provision of mobile flood light tower for the use by the Engineer's staff for works areas during night work or where instructed	Lump Sum		1		
PSC1.5.16	Provision of escort services for all project vehicles	Lump Sum		1		
C11.6.1.8	Regulatory signs, temporary					
(c)	1200mm size retro reflective sign boards	No		30		
C11.6.1.10	Warning signs, temporary					
(c)	1200mm size retro reflective sign boards	No		30		
(d)	1500mm size retro reflective sign boards	No		10		
TOTAL CARRIED FORWARD TO SUMMARY						

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SCHEDULE A: PRELIMINARY AND GENERAL

C2.1: GENERAL REQUIREMENTS AND TRENCHING FOR SERVICES

ITEM	DESCRIPTION	UNIT	LI	QUANTITY	RATE	AMOUNT
C2.1	GENERAL REQUIREMENTS AND TRENCHING FOR SERVICES NOTE TO THE CONTRACTOR: THE FOLLOW CHAPTER SHALL BE APPLICABLE TO ALL SCOPE OR WORKS - CIVIL, ELECTRICAL AND MECHANICAL					
C2.1.1	Location, Identification and relocation of existing services					
C2.1.1.1	Contractors' obligations	Lump Sum		1		
C2.1.1.4	Permanent services relocation or protection work by Contractor	PC Sum		250 000	1	250 000
C2.1.2.3	Survey to verify existing service positions as directed by the Engineer. Survey may include scanning and or CCTV inspection of pipelines.	PC Sum		450 000	1	450 000
C2.1.2.4	Handling costs and profit in respect of item C2.1.2.3 above (Capped at 7.5%)	%		450 000		
C2.1.2.5	Using hand excavation to locate, expose and verify services	m ³	LI	1 000		
C2.1.3	Obtaining construction or work permits	Lump Sum		1		
PSC2.1.28 (a)	Hydro Jetting of service pipelines and clearing siltation	PC Sum		400 000	1	400 000
PSC2.1.28 (b)	Handling costs and profit in respect of sub-item PSC 2.1.28 (a) b above (Capped at 7.5%)	%		400 000		
PSC2.1.29	Mandrel testing of all electrical sleeves as directed by the Engineer including flushing of the sleeves as required.	m		1 900		
TOTAL CARRIED FORWARD TO SUMMARY						

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SCHEDULE A: PRELIMINARY AND GENERAL

C20.1: TESTING MATERIALS AND JUDGEMENT OF WORKMANSHIP

ITEM	DESCRIPTION	UNIT	LI	QUANTITY	RATE	AMOUNT
C20.1	TESTING MATERIALS AND JUDGEMENT OF WORKMANSHIP					
PSC20.01.6 (a)	a) Provision for testing materials and judgement of workmanship	PC Sum		3 500 000	1	3 500 000
PSC20.01.6 (b)	Handling costs and profit in respect of item PSC20.01.6(a) (Capped at 7.5%)	%		3 500 000		
TOTAL CARRIED FORWARD TO SUMMARY						

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PERIOD OF 12 MONTHS**

**PART A: TENDER NO. KSIA7806/2025/RFP – CIVIL ENGINEERING
SCHEDULE A: PRELIMINARY AND GENERAL
SUMMARY OF SECTIONS**

CHAPTER	DESCRIPTION	FROM PAGE	AMOUNT
C1.2	GENERAL REQUIREMENTS AND PAYMENT	C2-8	R
C1.3	CONTRACTOR'S SITE ESTABLISHMENT AND GENERAL OBLIGATIONS	C2-9	R
C1.4	FACILITIES FOR THE ENGINEER	C2-11	R
C1.5	ACCOMMODATION OF TRAFFIC	C2-14	R
C2.1	GENERAL REQUIREMENTS AND TRENCHING FOR SERVICES	C2-15	R
C20.1	TESTING MATERIALS AND JUDGEMENT OF WORKMANSHIP	C2-16	R
TOTAL CARRIED FORWARD TO TENDER SUMMARY			R

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**SCHEDULE B: BRAVO TAXIWAY
C1.6: CLEARING AND GRUBBING**

ITEM	DESCRIPTION	UNIT	LI	QUANTITY	RATE	AMOUNT
C1.6	CLEARING AND GRUBBING					
C1.6.1	Clearing					
C1.6.1.1	Clearing with machines and some hand labour where necessary	ha		10		
C1.6.1.2	Clearing with hand labour only when labour enhanced work is specified	ha	LI	1		
C1.6.2	Grubbing					
C1.6.2.1	Grubbing with machines and some hand labour where necessary	ha		10		
TOTAL CARRIED FORWARD TO SUMMARY						

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SCHEDULE B: BRAVO TAXIWAY
C1.7: LOADING AND HAULING

ITEM	DESCRIPTION	UNIT	LI	QUANTITY	RATE	AMOUNT
C1.7	LOADING AND HAULING					
C1.7.1	Loading					
C1.7.1.1	Loading from stockpile using machines and some hand labour where necessary	m ³		1 000		
C1.7.1.2	Loading from heaps or windrows using machines and/some hand labour where necessary	m ³		1 000		
C1.7.1.3	Loading by hand only from stockpile or heaps when labour enhancement work is specified or is not possible to use machines	m ³	LI	500		
C1.7.2	Hauling					
C1.7.2.1	Hauling material for use in the Works and off-loading it on the site of the Works:					
(a)	Soil, gravel, crushed stone and pavement layer material	m ³ - km		5 000		
C1.7.2.2	Hauling material to spoil and off-loading it at a designated spoil or stockpile are:					
(b)	Soil and gravel material	m ³ - km		40 000		
(c)	Boulders, hard material and concrete	m ³ - km		7 500		
TOTAL CARRIED FORWARD TO SUMMARY						

TENDER NO: KSIA7806/2025/RFP - PROCUREMENT OF A CIDB GRADE 9 CE CONTRACTOR THE COMPLETION OF BRAVO TAXIWAY EXTENSION AT KING SHAKA INTERNATIONAL AIRPORT FOR A PERIOD OF 12 MONTHS

SCHEDULE B: BRAVO TAXIWAY

C3.1: DRAINS

ITEM	DESCRIPTION	UNIT	LI	QUANTITY	RATE	AMOUNT
C3.1	DRAINS					
C3.1.1	Excavation for open drains:					
C3.1.1.1	Excavating all material situated within the following depth ranges below the surface level using conventional methods:					
(a)	0m to 1.5m	m ³		4 500		
(b)	Exceeding 1.5m and up to 3.0m	m ³		100		
C3.1.1.2	Extra over sub-item C3.1.1.1 for excavation in hard and boulder material, irrespective of depth	m ³		100		
C3.1.3	Excavation, clearing and disposal of accumulated sediment in existing lined drains and drainage systems					
C3.1.3.3	Using labour enhanced construction methods:					
(a)	Manholes and inlet and outlet structures	m ³	LI	300		
(c)	Concrete and other lined side drains	m ³	LI	100		
C3.1.4	Excavation and disposal of material for subsoil drainage systems					
C3.1.4.1	Excavating in all material situated within the following depth ranges below the surface:					
(b)	Exceeding 1.5m and up to 3.0m	m ³		125		
C3.1.4.2	Excavating soft material situated within 0m to 1.5m below the surface level using labour enhanced construction methods	m ³	LI	830		
C3.1.4.4	Extra over sub-item C3.1.4.1 for excavation in hard and boulder material, irrespective of depth	m ³		50		
C3.1.7	Natural permeable material in subsoil drainage system (approved crushed stone):					
C3.1.7.1	Crushed stone obtained from approved sources on the site as per detailed drawing	m ³	LI	715		
C3.1.8	Natural permeable material in subsoil drainage system (approved natural sand)					
C3.1.8.2	Natural sand from commercial sources (fine)	m ³	LI	209		
C3.1.9	Pipes in subsoil drainage systems:					
C3.1.9.1	U-PVC pipes and fittings, normal duty, complete with coupling (160mm dia and perforated) as per detailed drawing KSIA-CIV-DP-021 & KSIA-CIV-DP-022	m	LI	3 940		
TOTAL CARRIED FORWARD						

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SCHEDULE B: BRAVO TAXIWAY

C3.1: DRAINS

ITEM	DESCRIPTION	UNIT	LI	QUANTITY	RATE	AMOUNT
	TOTAL BROUGHT FORWARD					
C3.1.10	Polymer film sheeting or similar approved material, for lining subsoil drainage systems:					
C3.1.10.1	Bidim A2 Geotextile	m ²	LI	6 080		
C3.1.13	Concrete outlet structures, manhole boxes, junction boxes and cleaning eyes for subsoil drainage systems:					
C3.1.13.2	Inspection boxes	No	LI	20		
C3.1.13.4	Cleaning eyes as per detailed drawing KSIA-CIV-DP-021, KSIA-CIV-DP-022 & KSIA-CIV-SD-032A Complete	No	LI	70		
C3.1.18	Backfilling of drains with selected material compacted to 93 % of MDD prior to construction of concrete lining and/or stone pitched lining	m ³	LI	150		
C3.1.22	Test flushing of subsoil drainpipe systems	No	LI	1		
C3.1.23	Subsoil drains outlet marker	No	LI	1		
TOTAL CARRIED FORWARD TO SUMMARY						

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SCHEDULE B: BRAVO TAXIWAY

C3.2: CULVERTS

ITEM	DESCRIPTION	UNIT	LI	QUANTITY	RATE	AMOUNT
C3.2	CULVERTS					
C3.2.1	Excavation for culvert structures:					
C3.2.1.1	Excavating in all material situated within the following depth ranges below the surface level:					
(a)	0m to 1.5m	m ³		2 625		
(b)	Exceeding 1.5m and up to 3.0m	m ³		656		
C3.2.1.4	Extra over sub-item C3.2.1.1 for excavation in hard or boulder material, irrespective of depth	m ³		53		
C3.2.2	Backfilling:					
C3.2.2.1	Using the excavated material	m ³		1 663		
C3.2.2.2	Using imported selected material:					
(a)	From commercial sources (G7)	m ³		175		
C3.2.3	Concrete pipe culverts:					
C3.2.3.3	On Class C bedding (100D 600mm Dia.)	m		109		
C3.2.3.3	On Class C bedding (100D 900mm Dia.)	m		168		
C3.2.3.3	On Class C bedding (100D 1200mm Dia.)	m		322		
C3.2.12	Demolition of concrete members or elements:					
C3.2.12.2	Partial member or element (Bravo taxiway - existing stormwater manhole)	m ³		30		
C3.2.19.2	Inlet grids or covers (3 x heavy duty high strength concrete dog bone cover)	No		10		
C3.2.23	Breaking into existing drainage structures and building in pipes or culverts of the following size (160mm diameter pipe)	No	LI	40		
PSC3.2.28	Manholes, catchpits, precast inlet and outlet structures complete:					
	(a) Manhole drop inlet (Irrespective of depth)	No	L.I	7		
	(b) Grid inlet complete for 600mm dia. pipe (Irrespective of depth)	No	LI	6		
	(c) Grid inlet complete for 900mm dia. pipe (Irrespective of depth)	No	LI	4		
	(d) Grid inlet complete for 1200mm dia. pipe (Irrespective of depth)	No	LI	4		
TOTAL CARRIED FORWARD TO SUMMARY						

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SCHEDULE B: BRAVO TAXIWAY
C4.2: CUT MATERIALS

ITEM	DESCRIPTION	UNIT	LI	QUANTITY	RATE	AMOUNT
C4.2	CUT MATERIALS					
C4.2.3	Excavating of materials in cuttings, material obtained from					
C4.2.3.1	Soft excavation	m ³		2 000		
C4.2.3.4	Hard excavation (other than by blasting)	m ³		100		
C4.2.12	Finishing the side slopes					
C4.2.12.1	Cuttings:					
(a)	In soft material	m ²		500		
TOTAL CARRIED FORWARD TO SUMMARY						

TENDER NO: KSIA7806/2025/RFP - PROCUREMENT OF A CIDB GRADE 9 CE CONTRACTOR THE COMPLETION OF BRAVO TAXIWAY EXTENSION AT KING SHAKA INTERNATIONAL AIRPORT FOR A PERIOD OF 12 MONTHS

**SCHEDULE B: BRAVO TAXIWAY
C4.3: EXISTING ROAD MATERIALS**

ITEM	DESCRIPTION	UNIT	LI	QUANTITY	RATE	AMOUNT
C4.3	EXISTING ROAD MATERIALS					
C4.3.2	Cleaning the existing road surface					
C4.3.2.1	Cost to clean the road surface as instructed by the Engineer	Prov Sum		100 000	1	100 000
C4.3.2.2	Handling costs and profit in respect of item C4.3.2.1 (Capped at 7.5%)	%		100 000		
C4.3.4	Saw-cutting existing materials within the following average depth ranges					
C4.3.4.1	Asphalt material:					
(a)	Up to 50 mm	m		1 000		
(b)	Exceeding 50 mm and up to 100 mm	m		500		
C4.3.5	Providing the milling machine on the site					
C4.3.5.2	Large milling machine with a cutting width exceeding 1,2 m	No		1		
C4.3.6	Milling and removal of existing asphalt layers with an average milling depth (Contractor takes ownership)					
C4.3.6.1	Not exceeding 50 mm	m ³		1 400		
C4.3.6.2	Exceeding 50 mm but not exceeding 100 mm	m ³		450		
C4.3.14	Removing of existing road edging using construction equipment					
(a)	Kerbing and edge beams:					
(ii)	Precast concrete kerbing (Figure 12)	m		500		
TOTAL CARRIED FORWARD TO SUMMARY						

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**SCHEDULE B: BRAVO TAXIWAY
C4.4: COMMERCIAL MATERIALS**

ITEM	DESCRIPTION	UNIT	LI	QUANTITY	RATE	AMOUNT
C4.4	COMMERCIAL MATERIALS					
C4.4.2	Commercial materials identified by the Contractor from commercial, private or other non-commercial suppliers					
C4.4.2.1	Pavement layer material:					
(h)	Type G7 material (for shoulder make up)	m ³		1 000		
C4.4.2.5	Fill material in the earthworks:					
(a)	Normal or coarse fill	m ³		4 000		
C4.4.7	Sampling and material testing by a commercial laboratory for the stabilisation designs					
C4.4.7.1	Cost of sampling and material testing	Prov Sum		75 000	1	75 000
C4.4.7.2	Handling cost and profit in respect of item C4.4.7.1 (Capped at 7.5%)	%		75 000		
TOTAL CARRIED FORWARD TO SUMMARY						

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SCHEDULE B: BRAVO TAXIWAY

C5.2: FILL

ITEM	DESCRIPTION	UNIT	LI	QUANTITY	RATE	AMOUNT
C5.2	FILL					
C5.2.2	Fill construction					
C5.2.2.1	Normal fill material in compacted layer thicknesses of 200 mm and less:					
(a)	Compacted to 90% MDD	m ³		4 000		
C5.2.5.2	Fill material in sidewalk & shoulders compacted to 93% of MDD using labour enhanced methods of construction and light hand equipment	m ³		1 000		
C5.2.11	Finishing off fill slopes, medians and interchange areas					
C5.2.11.1	Fill slopes	m ²		1 000		
TOTAL CARRIED FORWARD TO SUMMARY						

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SCHEDULE B: BRAVO TAXIWAY
C8.1: PRIME COAT

ITEM	DESCRIPTION	UNIT	LI	QUANTITY	RATE	AMOUNT
C8.1	PRIME COAT					
C8.1.1	Prime coat:					
C8.1.1.2	MC - 30 cut-back bitumen (Application Rate 0,7l/m2)	ℓ		5 500		
C8.1.3	Extra over item C8.1.1 for applying the prime coat accessible only to hand-held or light equipment	ℓ	LI	550		
TOTAL CARRIED FORWARD TO SUMMARY						

TENDER NO: KSIA7806/2025/RFP - PROCUREMENT OF A CIDB GRADE 9 CE CONTRACTOR THE COMPLETION OF BRAVO TAXIWAY EXTENSION AT KING SHAKA INTERNATIONAL AIRPORT FOR A PERIOD OF 12 MONTHS

**SCHEDULE B: BRAVO TAXIWAY
C8.5: STANDARD CRACK SEALING**

ITEM	DESCRIPTION	UNIT	LI	QUANTITY	RATE	AMOUNT
C8.5	STANDARD CRACK SEALING					
C8.5.1.1	Cleaning cracks					
(a)	Cleaning cracks with cold compressed air	m	LI	2 500		
C8.5.1.2	Applying herbicides for sealing cracks	ℓ	LI	175		
C8.5.1.3	Priming	ℓ	LI	175		
C8.5.1.4	Sealing the cracks					
(a)	Sealing using (polymer modified bitumen)	ℓ	LI	200		
C8.5.1.5	Heating of surface before rolling	m	LI	2 500		
C8.5.1.6	Rolling the cracks	m	LI	2 500		
TOTAL CARRIED FORWARD TO SUMMARY						

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SCHEDULE B: BRAVO TAXIWAY

C8.8: PATCHING AND EDGE BREAK REPAIR

ITEM	DESCRIPTION	UNIT	LI	QUANTITY	RATE	AMOUNT
C8.8	PATCHING AND EDGE BREAK REPAIR					
C8.8.1	Saw cutting pavement layers for patching					
C8.8.1.1	Asphalt or bituminous surfacing to an average depth					
(a)	Not exceeding 50 mm	m	LI	500		
(b)	Exceeding 50 mm but not exceeding 100 mm	m	LI	100		
PSC8.8.7	Reconstructing edges as per Engineers Detail Drawing (KSIA-CIV-TX-004) complete	m ²	LI	350		
PSC8.8.8	Supply and install 150mm x 150mm x10mm steel plate epoxied over existing lighting core holes on Bravo Taxiway. The rate is to include GPS logging of the existing lighting core holes before the steel plate is installed.	No	LI	90		
TOTAL CARRIED FORWARD TO SUMMARY						

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SCHEDULE B: BRAVO TAXIWAY

C9.1: ASPHALT LAYERS

ITEM	DESCRIPTION	UNIT	LI	QUANTITY	RATE	AMOUNT
C9.1	ASPHALT LAYERS					
C9.1.1	Asphalt mix designs					
C9.9.1.2	Sand skeletal mixes:					
(a)(i)	Continuously Graded Surfacing (SA-E14 - A-P1 Modified Binder (PG64E-16) Level 3 Design) (NMPS 14mm)	Lump Sum		1		
(a)(ii)	Continuously Graded Base (A-E2 Modified Binder and Level 3 design) (NMPS 14mm)	Lump Sum		1		
(g)	High Modulus Asphalt (Class II EME) (10-20 Penetration Grade Bitumen Binder) (SABITA Manual 33) (NMPS 14mm)	Lump Sum		1		
C9.1.2	Construction of trial sections					
C9.1.2.1	Asphalt layers (Continuously graded base, layer thickness (varies) and placing technique (paver))	m ²		500		
C9.1.2.1	Asphalt layers (High Modulus Asphalt (Class II EME), layer thickness (70mm) and placing technique (paver))	m ²		590		
C9.1.2.1	Asphalt layers (High Modulus Asphalt (Class II EME), layer thickness (90mm) and placing technique (paver))	m ²		453		
C9.1.2.1	Asphalt layers (Continuously graded surfacing, layer thickness (50mm) and placing technique (paver))	m ²		820		
C9.1.2.2	Removal of trial section where so instructed by the Engineer	m ²		2 363		
C9.1.3	Application of bond coat					
C9.1.3.1	Stable grade 60% net bitumen emulsion as specified. Applied with a calibrated distributor	ℓ		129 257		
C9.1.3.1(ii)	E36 Cationic bitumen emulsion 60% with the addition of organo functional silanes, 3% SBR latex and trackless properties. Applied with a calibrated distributor	ℓ		60 300		
C9.1.3.2	Applied in restricted areas using a portable pressure sprayer	ℓ	LI	10 000		
C9.1.3.3	Applied by hand using brushes on all exposed transverse and longitudinal construction joints	ℓ	LI	15 000		
C9.1.4	Asphalt base					
C9.1.4.2	Rehabilitation					
(b)(i)	Sand skeletal mix - high modulus asphalt (Class II EME) (70mm layer thickness, 10-20 Penetration Grade Bitumen, design class (Sabita Manual 33) and placing technique paver) (NMPS 14mm)	t		5 785		
TOTAL CARRIED FORWARD						

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SCHEDULE B: BRAVO TAXIWAY
C9.1: ASPHALT LAYERS

ITEM	DESCRIPTION	UNIT	LI	QUANTITY	RATE	AMOUNT
TOTAL BROUGHT FORWARD						
(b)(ii)	Sand skeletal mix - high modulus asphalt (Class II EME) (90mm layer thickness, 10-20 Penetration Grade Bitumen, design class (Sabita Manual 33) and placing technique paver) (NMPS 14mm)	t		1722		
(c)	Sand skeletal mix - continuously graded asphalt as defined (variable layer thickness, AE-2 Modified binder, design class/level III and placing technique Paver) (NMPS 14mm)	t		11 880		
C9.1.5 C9.1.5.2	Asphalt surfacing Rehabilitation					
(e)(i)	Sand skeletal mix - continuously graded as defined (50mm layer thickness, SA-E14 - A-P1 Modified Binder (PG64E-16), design class/level III and placing technique paver) (NMPS 14mm)	t		17 419		
(e)(ii)	Sand skeletal mix - continuously graded as defined (30mm layer thickness, SA-E14 - A-P1 Modified Binder (PG64E-16), design class/level III and placing technique paver) (NMPS 14mm)	t		440		
C9.1.7	Placing and compacting asphalt in restricted areas					
C9.1.7.1 (a)	Extra over payment item C9.1.4.1 and C9.1.5.1 (Sand skeletal mix - continuously graded as defined (variable layer thickness, AE-2 Modified binder type, design class/level III and placing technique Paver) (NMPS 14mm)	m ²		2 000		
C9.1.7.1 (b)	Extra over payment item C9.1.4.1 and C9.1.5.1 (Sand skeletal mix - high modulus asphalt (EME II) (70mm layer thickness, 10-20 Penetration Grade Bitumen, design class (Sabita Manual 33) and placing technique paver) (NMPS 14mm))	m ²		2 000		
C9.1.7.1 (b)	Extra over payment item C9.1.4.1 and C9.1.5.1 (Sand skeletal mix - high modulus asphalt (EME II) (90mm layer thickness, 10-20 Penetration Grade Bitumen, design class (Sabita Manual 33) and placing technique paver) (NMPS 14mm))	m ²		500		
C9.1.7.1 (c)	Extra over payment item C9.1.4.1 and C9.1.5.1 (Sand skeletal mix - continuously graded as defined (50mm layer thickness, Sa-E14 - A-P1 Modified Binder (PG64E-16) and design class/level III and placing technique paver) (NMPS 14mm))	m ²		1 750		
C9.1.7.1 (c)	Extra over payment item C9.1.4.1 and C9.1.5.1 (Sand skeletal mix - continuously graded as defined (30mm layer thickness, Sa-E14 - A-P1 Modified Binder (PG64E-16) and design class/level III and placing technique paver) (NMPS 14mm))	m ²		250		
TOTAL CARRIED FORWARD						

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SCHEDULE B: BRAVO TAXIWAY
C9.1: ASPHALT LAYERS

ITEM	DESCRIPTION	UNIT	LI	QUANTITY	RATE	AMOUNT
TOTAL BROUGHT FORWARD						
C9.1.10	Variation rates					
C9.1.10.1 (a)	Bitumen (10-20 penetration grade bitumen)	t		5		
C9.1.10.1 (b)	Bitumen (A-P1 Modified Binder)	t		5		
C9.1.10.1 (b)	Bitumen (AE-2 Modified Binder)	t		5		
C9.1.13	Coring of asphalt layers					
C9.1.13.1	100 mm diameter	No	LI	800		
C9.1.13.2	150 mm diameter	No	LI	200		
C9.1.13.3	100 mm diameter cores through GPS logged lighting positions	No	LI	120		
C9.1.14	Surface regularity testing as described in Clause A9.1.8.4					
C9.1.14.1	Establishment of equipment: (Inertial laser profilometre)	No		1		
C9.1.14.2	Profiler Surveys utilising equipment as specified - Base layers and surfacing layers	km		44		
TOTAL CARRIED FORWARD TO SUMMARY						

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SCHEDULE B: BRAVO TAXIWAY

C11.7: MARKINGS AND ROAD STUDS

ITEM	DESCRIPTION	UNIT	LI	QUANTITY	RATE	AMOUNT
C11.7	MARKINGS AND ROAD STUDS					
	Bravo Taxiway					
C11.7.2	Retro-reflective Road marking:					
C11.7.2.1	White lines broken or unbroken (300mm wide water-borne paint or similar approved)	km	LI	3		
C11.7.2.2 (i)	Yellow lines broken or unbroken (300mm wide water-borne paint or similar approved)	km	LI	8		
C11.7.2.2 (ii)	Yellow lines broken or unbroken (700mm wide water-borne paint or similar approved)	km	LI	0.20		
C11.7.2.4	White lettering and symbols (water-borne paint or similar approved)	m ²	LI	400		
C11.7.2.5	Yellow lettering and symbols (water-borne paint or similar approved)	m ²	LI	1 400		
C11.7.2.6	Red lettering and symbols (water-borne paint or similar approved)	m ²	LI	60		
C11.7.2.7	Transverse lines, painted island and arrestor bed markings (any colour as specified) (water-borne paint)	m ²	LI	450		
C11.7.5	Variations in rate of application:					
C11.7.5.1	White paint	ℓ		50		
C11.7.5.2	Yellow paint	ℓ		75		
C11.7.5.4	Retro-reflective beads	kg		200		
C11.7.8	Setting out and premarking the lines (excluding traffic island markings, lettering and symbols)	km	LI	12		
C11.7.9	Re-establishing the painting unit during the defect's notification period and at other instances on instruction of the Engineer	No		1		
TOTAL CARRIED FORWARD TO SUMMARY						

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SCHEDULE B: BRAVO TAXIWAY

C11.8: LANDSCAPING AND PLANTING PLANTS

ITEM	DESCRIPTION	UNIT	LI	QUANTITY	RATE	AMOUNT
C11.8	LANDSCAPING AND PLANTING PLANTS					
C11.8.3	Preparing the areas for grassing:					
C11.8.3.2	Scarifying for loosening topsoil	ha	LI	1		
C11.8.3.3	Topsoiling within the road reserve where the following materials are used:					
(a)	Topsoil obtained from within the road reserve or borrow areas	m³	LI	750		
C11.8.3.5	Providing and applying chemical fertilisers and/or soil-improvement material:					
(b)	Superphosphate	t		5		
(d)	2:3:2 (22)	t		1		
C11.8.4	Grassing					
C11.8.4.3	Hydroseeding:					
(a)	Providing an approved seed mixture for hydroseeding	kg		200		
(c)	Hydroseeding	ha		2		
C11.8.5	Watering the grass when established by topsoiling only	kℓ		500		
TOTAL CARRIED FORWARD TO SUMMARY						

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PART A: TENDER NO. KSIA7806/2025/RFP – CIVIL ENGINEERING
SCHEDULE B: BRAVO TAXIWAY
SUMMARY OF SECTIONS

CHAPTER	DESCRIPTION	FROM PAGE	AMOUNT
C1.6	CLEARING AND GRUBBING	C2-18	R
C1.7	LOADING AND HAULING	C2-19	R
C3.1	DRAINS	C2-21	R
C3.2	CULVERTS	C2-22	R
C4.2	CUT MATERIALS	C2-23	R
C4.3	EXISTING ROAD MATERIALS	C2-24	R
C4.4	COMMERCIAL MATERIALS	C2-25	R
C5.2	FILL	C2-26	R
C8.1	PRIME COAT	C2-27	R
C8.5	STANDARD CRACK SEALING	C2-28	R
C8.8	PATCHING AND EDGE BREAK REPAIR	C2-29	R
C9.1	ASPHALT LAYERS	C2-32	R
C11.7	MARKINGS AND ROAD STUDS	C2-33	R
C11.8	LANDSCAPING AND PLANTING PLANTS	C2-34	R
TOTAL CARRIED FORWARD TO TENDER SUMMARY			R

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SCHEDULE C: NEW TIE-IN QUEBEC
C1.6: CLEARING AND GRUBBING

ITEM	DESCRIPTION	UNIT	LI	QUANTITY	RATE	AMOUNT
C1.6	CLEARING AND GRUBBING					
C1.6.1	Clearing					
C1.6.1.1	Clearing with machines and some hand labour where necessary	ha		3.5		
C1.6.2	Grubbing					
C1.6.2.1	Grubbing with machines and some hand labour where necessary	ha		3.5		
TOTAL CARRIED FORWARD TO SUMMARY						

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SCHEDULE C: NEW TIE-IN QUEBEC
C1.7: LOADING AND HAULING

ITEM	DESCRIPTION	UNIT	LI	QUANTITY	RATE	AMOUNT
C1.7	LOADING AND HAULING					
C1.7.1	Loading					
C1.7.1.1	Loading from stockpile using machines and some hand labour where necessary	m ³		2 000		
C1.7.2	Hauling					
C1.7.2.1	Hauling material for use in the Works and off-loading it on the site of the Works:					
(a)	Soil, gravel, crushed stone and pavement layer material	m ³ - km		20 000		
C1.7.2.2	Hauling material to spoil and off-loading it at a designated spoil or stockpile are:					
(a)	Cleared and grubbed material (organic matter and all other unsuitable or waste material)	m ³ - km		22 000		
(b)	Soil and gravel material	m ³ - km		80 000		
(c)	Boulders, hard material and concrete	m ³ - km		10 000		
TOTAL CARRIED FORWARD TO SUMMARY						

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SCHEDULE C: NEW TIE-IN QUEBEC

C2.1: GENERAL REQUIREMENTS AND TRENCHING FOR SERVICES

ITEM	DESCRIPTION	UNIT	LI	QUANTITY	RATE	AMOUNT
C2.1	GENERAL REQUIREMENTS AND TRENCHING FOR SERVICES					
C2.1.1	Location, Identification and relocation of existing services					
C2.1.2.5	Using hand excavation to locate, expose and verify services	m ³		100		
C2.1.6	Trench excavation (in soft material)					
C2.1.6.1	Trenches up to 1.0m wide:					
(a)	Up to 1.0m deep	m ³		2 225		
(b)	Over 1.0m and up to 2.0m deep	m ³		750		
C2.1.7	Extra over items C2.1.6, C2.1.8and C2.1.16 for excavating in:					
C2.1.7.1	Hard material irrespective of depth	m ³		300		
C2.1.7.2	Stabilised material irrespective of depth	m ³		150		
C2.1.8	Excavations outside the normal trench profile	m ³		500		
C2.1.11	Backfilling of trenches					
C2.1.11.1	Backfill compacted to 93% (100% for sand) of MDD (areas subject to traffic loads) using material:					
(a)	From the excavated trench material	m ³		2 050		
(e)	From commercial sources (G7 Material)	m ³		300		
C2.1.23	Reinstatement of trenches in existing surfaced roads using:					
C2.1.23.1	Selected material (state material type and source, e.g. G7, commercial and 300mm layer thickness) compacted to (95% compaction) of MDD	m ³		200		
C2.1.23.3	Stabilised subbase material (C2 (Minimum G2 material), commercial and 400mm layer thickness) using (4% cement stabilising agent) compacted to (97% compaction) of MDD	m ³		200		
C2.1.23.5	Prime coat (MC - 30 cut-back bitumen (Application Rate 0,7l/m ²))	m ²		350		
C2.1.23.6	Tack coat (Stable grade 60% net bitumen emulsion as specified)	m ²		350		
TOTAL CARRIED FORWARD						

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SCHEDULE C: NEW TIE-IN QUEBEC

C2.1: GENERAL REQUIREMENTS AND TRENCHING FOR SERVICES

ITEM	DESCRIPTION	UNIT	LI	QUANTITY	RATE	AMOUNT
TOTAL BROUGHT FORWARD						
C2.1.23.7 (a)	Asphalt material (Sand skeletal mix - continuously graded asphalt as defined (50mm layer thickness, Sa-E14 - A-P1 Modified Binder (PG64E-16), design class/level III and placing technique paver) (NMPS 14mm))	t		70		
C2.1.23.7 (b)	Asphalt material (Sand skeletal mix - high modulus asphalt (Class II EME) (120mm layer thickness, 10-20 Penetration Grade Bitumen, design class (Sabita Manual 33) and placing technique paver) (NMPS 14mm) (Constructed in 2 lifts))	t		120		
C2.1.24.3	Saw-cutting materials (asphalt surfacing and base) to an average depth: to an average depth:					
(a)	Not exceeding 50 mm	m		1 300		
(b)	Exceeding 50 mm but not exceeding 100 mm	m		1 300		
(c)	Exceeding 100 mm but not exceeding 150 mm	m		1 300		
C2.1.25	Removal of existing services:					
C2.1.25.1	Removal of existing 32mm duct on taxiway and shoulder	m		250		
C2.1.25.2	Removal of existing 110mm duct on taxiway and shoulder	m		250		
C2.1.25.3	Removal of existing taxiway and shoulder lighting	No		10		
C2.1.27	Demolition of existing manholes, access chambers and other service structures consisting of:					
C2.1.27.1	Unreinforced concrete	m ³		30		
C2.1.27.2	Reinforced concrete	m ³		30		
C2.1.27.3	Masonry	m ³		150		
TOTAL CARRIED FORWARD TO SUMMARY						

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SCHEDULE C: NEW TIE-IN QUEBEC
C2.2: DRY SERVICES

ITEM	DESCRIPTION	UNIT	LI	QUANTITY	RATE	AMOUNT
C2.2	DRY SERVICES					
C2.1.1	Supply, lay and prove ducts					
C2.2.1.1	110mm internal dia uPVC pipes					
(a)	State diameter (110 mm diameter (OD))	m		15 340		
(b)	State diameter (32 mm diameter (OD))	m		2 000		
C2.2.4	Bedding for ducts compacted to 90 % of MDD (100 % for sand) using material:					
C2.2.4.1	Selected from the excavated trench material	m ³		500		
C2.2.4.5	From commercial sources					
(a)	Non-cohesive material (G7 Type Material)	m ³		250		
(b)	Non-cohesive material (Sand)	m ³		250		
C2.2.6	Duct accessories (markers, marking, draw wires and end caps etc.)					
C2.2.6.4	End caps or plugs (Upvc)	No		70		
C2.2.7.2	Manholes (Electrical Manholes and drawing reference KSIA-CIV-SD-032A.)					
(a)	0m - 1.5m	No		30		
C2.2.8	Covers and frames for duct handholes, manholes and access chambers					
C2.2.8.1	Electrical Manholes, strength class 25mpa and 3m x 3m cover and frame - Type H Pit Cover - Drawing reference KSIA-CIV-SD-032A	No		30		
PSC2.2.10	Raising and lowering existing electrical airport manholes - drawing reference KSIA-CIV-SD-032A	No		10		
C2.2/C13.2.1	Formwork to provide (class F3) surface finish to (light signage bases)	m ²		25		
C2.2/C13.3.1.1	(Light signage bases):					
(a)	Mild-steel bars	t		1		
(b)	High-yield-stress-steel bars (type indicated)	t		11		
C2.2/C13.4.1.1	Strength concrete (class C):					
(a)	Light signage bases C25/30-19	m ³		37		
PSC2.2.11	Coring into existing concrete/masonry manholes					
(a)	110mm cores	No		50		
(b)	32mm cores	No		50		
TOTAL CARRIED FORWARD TO SUMMARY						

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SCHEDULE C: NEW TIE-IN QUEBEC

C3.1: DRAINS

ITEM	DESCRIPTION	UNIT	LI	QUANTITY	RATE	AMOUNT
C3.1	DRAINS					
C3.1.1	Excavation for open drains:					
C3.1.1.1	Excavating all material situated within the following depth ranges below the surface level using conventional methods:					
(a)	0m to 1.5m	m ³		2 000		
(b)	Exceeding 1.5m and up to 3.0m	m ³		50		
C3.1.1.2	Extra over sub-item C3.1.1.1 for excavation in hard and boulder material, irrespective of depth	m ³		50		
C3.1.3	Excavation, clearing and disposal of accumulated sediment in existing lined drains and drainage systems					
C3.1.3.3	Using labour enhanced construction methods:					
(a)	Manholes and inlet and outlet structures	m ³	LI	150		
C3.1.4	Excavation and disposal of material for subsoil drainage systems					
C3.1.4.1	Excavating in all material situated within the following depth ranges below the surface:					
(b)	Exceeding 1.5m and up to 3.0m	m ³		50		
C3.1.4.2	Excavating soft material situated within 0m to 1.5m below the surface level using labour enhanced construction methods	m ³	LI	200		
C3.1.4.4	Extra over sub-item C3.1.4.1 for excavation in hard and boulder material, irrespective of depth	m ³		20		
C3.1.7	Natural permeable material in subsoil drainage system (approved crushed stone):					
C3.1.7.1	Crushed stone obtained from approved sources on the site as per detailed drawing	m ³	LI	125		
C3.1.8	Natural permeable material in subsoil drainage system (approved natural sand)					
C3.1.8.2	Natural sand from commercial sources (fine)	m ³	LI	37		
C3.1.9	Pipes in subsoil drainage systems:					
C3.1.9.1	U-PVC pipes and fittings, normal duty, complete with coupling (160mm dia and perforated) as per detailed drawing KSIA-CIV-DP-023	m	LI	690		
TOTAL CARRIED FORWARD						

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SCHEDULE C: NEW TIE-IN QUEBEC

C3.1: DRAINS

ITEM	DESCRIPTION	UNIT	LI	QUANTITY	RATE	AMOUNT
	TOTAL BROUGHT FORWARD					
C3.1.10	Polymer film sheeting or similar approved material, for lining subsoil drainage systems:					
C3.1.10.1	Bidim A2 Geotextile	m ²	LI	1 050		
C3.1.13	Concrete outlet structures, manhole boxes, junction boxes and cleaning eyes for subsoil drainage systems:					
C3.1.13.2	Inspection boxes	No	LI	3		
C3.1.13.4	Cleaning eyes as per detailed drawing KSIA-CIV-DP-021 & KSIA-CIV-DP-023 Complete	No	LI	19		
C3.1.18	Backfilling of drains with selected material compacted to 93 % of MDD prior to construction of concrete lining and/or stone pitched lining	m ³	LI	50		
C3.1.22	Test flushing of subsoil drainpipe systems	No	LI	1		
C3.1.23	Subsoil drains outlet marker	No	LI	1		
TOTAL CARRIED FORWARD TO SUMMARY						

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SCHEDULE C: NEW TIE-IN QUEBEC
C3.2: CULVERTS

ITEM	DESCRIPTION	UNIT	LI	QUANTITY	RATE	AMOUNT
C3.2	CULVERTS					
C3.2.1	Excavation for culvert structures:					
C3.2.1.1	Excavating in all material situated within the following depth ranges below the surface level:					
(a)	0m to 1.5m	m ³		150		
(b)	Exceeding 1.5m and up to 3.0m	m ³		25		
C3.2.1.4	Extra over sub-item C3.2.1.1 for excavation in hard or boulder material, irrespective of depth	m ³		10		
C3.2.2	Backfilling:					
C3.2.2.1	Using the excavated material	m ³		120		
C3.2.2.2	Using imported selected material:					
(a)	From commercial sources (G7)	m ³		25		
C3.2.3	Concrete pipe culverts:					
C3.2.3.3	On Class C bedding (100D 450mm Dia.)	m	LI	50		
C3.2.3.3	On Class C bedding (100D 600mm Dia.)	m	LI	100		
PSC3.2.28	Manholes, catchpits, precast inlet and outlet structures complete:					
	(a) Manhole drop inlet (Irrespective of depth)	No	L.I	4		
	(b) Grid inlet complete for 600mm dia. pipe (Irrespective of depth)	No	LI	4		
TOTAL CARRIED FORWARD TO SUMMARY						

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SCHEDULE C: NEW TIE-IN QUEBEC
C4.2: CUT MATERIALS

ITEM	DESCRIPTION	UNIT	LI	QUANTITY	RATE	AMOUNT
C4.2	CUT MATERIALS					
C4.2.4	Excavating of materials in box cuts, material obtained from					
C4.2.4.1	Soft excavation	m ³		12 750		
C4.2.4.2	Boulder excavation class A	m ³		1 000		
C4.2.4.3	Boulder excavation class B	m ³		1 000		
C4.2.4.4	Hard excavation (other than by blasting)	m ³		2 550		
C4.2.7	Removal of unsuitable stable cut material to spoil					
C4.2.7.1	In layer thicknesses of 200 mm and less	m ³		1 500		
C4.2.7.2	In layer thicknesses exceeding 200 mm	m ³		1 500		
C4.2.12	Finishing the side slopes					
C4.2.12.1	Cuttings:					
	In soft material	m ²		1 000		
PSC4.2.13	Dewatering excavations throughout the earthworks and fill operations by means of pumping	Lump Sum		1		
TOTAL CARRIED FORWARD TO SUMMARY						

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SCHEDULE C: NEW TIE-IN QUEBEC
C4.3: EXISTING ROAD MATERIALS

ITEM	DESCRIPTION	UNIT	LI	QUANTITY	RATE	AMOUNT
C4.3	EXISTING ROAD MATERIALS					
C4.3.4	Saw-cutting existing materials within the following average depth ranges					
C4.3.4.1	Asphalt material:					
(a)	Up to 50 mm	m	LI	250		
(b)	Exceeding 50 mm and up to 100 mm	m	LI	75		
C4.3.5	Providing the milling machine on the site					
C4.3.5.2	Large milling machine with a cutting width exceeding 1,2 m	No		1		
C4.3.6	Milling and removal of existing asphalt layers with an average milling depth (Contractor takes ownership)					
C4.3.6.1	Not exceeding 50 mm	m ³		450		
C4.3.6.2	Exceeding 50 mm but not exceeding 100 mm	m ³		250		
C4.3.7.3	Exceeding 100 mm	m ³		250		
C4.3.9	Excavating material by using conventional road construction equipment					
C4.3.9.2	Crushed stone and macadam materials	m ³		250		
C4.3.9.3	Cemented material	m ³		250		
C4.3.9.4	Natural gravel and sand materials	m ³		500		
TOTAL CARRIED FORWARD TO SUMMARY						

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SCHEDULE C: NEW TIE-IN QUEBEC

C4.4: COMMERCIAL MATERIALS

ITEM	DESCRIPTION	UNIT	LI	QUANTITY	RATE	AMOUNT
C4.4	COMMERCIAL MATERIALS					
C4.4.2	Commercial materials identified by the Contractor from commercial, private or other non-commercial suppliers					
C4.4.2.1	Pavement layer material:					
(b)	Type G2 material	m ³		1 023		
(f)	Type G5A material	m ³		4 372		
(j)(i)	Type G7 material	m ³		3 960		
(j)(ii)	Type G7 material 150mm thick (Sidewalk & Shoulders)	m ³		1 100		
(k)	Type G9 material	m ³		2 148		
C4.4.2.5	Fill material in the earthworks:					
(a)	Normal or coarse fill	m ³		2 750		
(b)	Rock Fil	m ³		5 632		
(c)	Type G5A material	m ³		1 100		
C4.4.4	Cementitious stabilising agents					
C4.4.4.1	Cement	t		330		
C4.4.7	Sampling and material testing by a commercial laboratory for the stabilisation designs					
C4.4.7.1	Cost of sampling and material testing	Prov Sum		75 000	1	75 000
C4.4.7.2	Handling cost and profit in respect of item C4.4.7.1	%		75 000		
PSC4.4.8	Supply and lay Rock Grid 200/200 as per detailed drawings	m ²		7 260		
PSC4.4.9	Supply and lay Bidim A4 Geotextile	m ²		15 400		
TOTAL CARRIED FORWARD TO SUMMARY						

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SCHEDULE C: NEW TIE-IN QUEBEC
C5.1: ROADBED

ITEM	DESCRIPTION	UNIT	LI	QUANTITY	RATE	AMOUNT
C5.1	ROADBED					
C5.1.1	Roadbed construction and compaction					
C5.1.1.1	Compaction of in-situ material to 90% of MDD	m ³		2 200		
C5.1.3.1	Excavate material to spoil from roadbed construction, material obtained from:					
(a)	Soft excavation	m ³		1 000		
(b)	Boulder excavation Class A	m ³		50		
(c)	Boulder excavation Class B	m ³		50		
C5.1.4	Removal of unsuitable material to spoil					
C5.1.4.1	In layer thicknesses of 200mm and less					
(a)	Stable material	m ³		500		
C5.1.4.1	In layer thicknesses exceeding 200mm					
(a)	Stable material	m ³		500		
TOTAL CARRIED FORWARD TO SUMMARY						

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SCHEDULE C: NEW TIE-IN QUEBEC
C5.2: CLEARING AND GRUBBING

ITEM	DESCRIPTION	UNIT	LI	QUANTITY	RATE	AMOUNT
C5.2	FILL					
C5.2.1	Compiling and implementing M&U plans					
C5.2.1.1	For fills more than 10 000 m ³ (list all fills separately)	No		1		
C5.2.2	Fill construction					
C5.2.2.1	Normal fill material in compacted layer thicknesses of 200 mm and less:					
(a)	Compacted to 90% MDD	m ³		2 750		
PSC5.2.2.4	Rock fill material all as per Clause A5.2.7.6	m ³		5 632		
C5.2.5.2	Fill material in sidewalk & shoulders compacted to 93% of MDD using labour enhanced methods of construction and light hand equipment	m ³		1 100		
C5.2.11	Finishing off fill slopes, medians and interchange areas					
C5.2.11.1	Fill slopes	m ²		1 000		
TOTAL CARRIED FORWARD TO SUMMARY						

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SCHEDULE C: NEW TIE-IN QUEBEC
C5.3: ROAD PAVEMENT LAYERS

ITEM	DESCRIPTION	UNIT	LI	QUANTITY	RATE	AMOUNT
C5.3	ROAD PAVEMENT LAYERS					
C5.3.1	Compiling and implementing M&U plans for the construction of all the pavement layers	No		5		
C5.3.2	Construction of pavement layers					
C5.3.2.1	Construction of layers using conventional construction methods:					
(b)	Lower selected subgrade layer (150mm) compacted to 93% of MDD	m ³		2 148		
(c)(i)	Upper selected subgrade layer (300mm) compacted to 95% of MDD (To be constructed in 2 layers of 150mm)	m ³		2 255		
(c)(ii)	Upper selected subgrade layer (250mm) compacted to 95% of MDD	m ³		1 760		
(l)(i)	Upper subbase gravel layer (chemically stabilised) (400mm) compacted to 97% of MDD (To be constructed in 2 layers of 200mm)	m ³		3 003		
(l)(i)	Upper subbase gravel layer (chemically stabilised) (200mm) compacted to 97% of MDD	m ³		1 397		
(m)	Gravel base layer (unstabilised), (150mm) compacted to 88% AD	m ³		1 125		
C5.3.9.1	Construction of a trial section using conventional methods of construction					
(c)	Crushed stone base layer (150mm) trial section	m ³		250		
TOTAL CARRIED FORWARD TO SUMMARY						

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SCHEDULE C: NEW TIE-IN QUEBEC
C5.4: STABILISATION

ITEM	DESCRIPTION	UNIT	LI	QUANTITY	RATE	AMOUNT
C5.4	STABILISATION					
C5.4.2	Chemical stabilisation					
C5.4.2.1 (i)	Chemical stabilisation (400mm) of pavement layers (To be constructed in 2 layers of 200mm)	m ³		3 003		
C5.4.2.1 (ii)	Chemical stabilisation (200mm) of pavement layers	m ³		1 397		
C5.4.5	Cementitious stabilisation agents for pavement layers					
C5.4.5.1	Addition of cementitious stabilisation agents for pavement layers					
(b)	Cement (for pavement layer)	t		330		
C5.4.10	Provision and application of water for curing	kℓ		1 000		
C5.4.11	Curing by covering with subsequent layer	m ²		4 400		
C5.4.14	Trial section for a chemically stabilised layer	m ³		500		
TOTAL CARRIED FORWARD TO SUMMARY						

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SCHEDULE C: NEW TIE-IN QUEBEC

C8.1: PRIME COAT

ITEM	DESCRIPTION	UNIT	LI	QUANTITY	RATE	AMOUNT
C8.1	PRIME COAT					
C8.1.1	Prime coat:					
C8.1.1.2	MC - 30 cut-back bitumen (Application Rate 0,7l/m2)	ℓ		11 400		
C8.1.3	Extra over item C8.1.1 for applying the prime coat accessible only to hand-held or light equipment	ℓ	LI	2 000		
TOTAL CARRIED FORWARD TO SUMMARY						

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SCHEDULE C: NEW TIE-IN QUEBEC
C9.1: ASPHALT LAYERS

ITEM	DESCRIPTION	UNIT	LI	QUANTITY	RATE	AMOUNT
C9.1	ASPHALT LAYERS					
C9.1.3	Application of bond coat					
C9.1.3.1	Stable grade 60% net bitumen emulsion as specified. Applied with a calibrated distributor	ℓ		11 000		
C9.1.3.2	Applied in restricted areas using a portable pressure sprayer	ℓ	LI	2 500		
C9.1.3.3	Applied by hand using brushes on all exposed transverse and longitudinal construction joints	ℓ	LI	2 500		
9.1.4	Asphalt Base					
C9.1.4.1	New construction					
(b)(i)	Sand skeletal mix - high modulus asphalt (Class II EME) (120mm layer thickness, 10-20 Penetration Grade Bitumen, design class (Sabita Manual 33) and placing technique paver) (NMPS 14mm) (Constructed in 2 lifts)	m ²		9 790		
C9.1.5	Asphalt surfacing					
C9.1.5.1	New construction					
(e)	Sand skeletal mix - continuously graded asphalt as defined (50mm layer thickness, Sa-E14 - A-P1 Modified Binder (PG64E-16), design class/level III and placing technique paver) (NMPS 14mm)	m ²		16 962		
C9.1.7	Placing and compacting asphalt in restricted areas					
C9.1.7.1	Extra over payment item C9.1.4.1 and C9.1.5.1 (120mm layer thickness, high modulus asphalt (Class II EME), 10-20 Penetration Grade Bitumen Binder, design class (Sabita Manual 33), 14mm nominal maximum particle size and placing technique (hand))	m ²		715		
C9.1.7.1	Extra over payment item C9.1.4.1 and C9.1.5.1 (50mm layer thickness, SA-E14 - A-P1 Modified Binder (PG64E-16), design class/level III, 14mm nominal maximum particle size and placing technique (hand))	m ²		1 375		
C9.1.10	Variation rates					
C9.1.10.1	Bitumen (10-20 penetration grade bitumen)	t		2		
C9.1.10.1	Bitumen (A-P1 Modified Binder)	t		2		
TOTAL CARRIED FORWARD						

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SCHEDULE C: NEW TIE-IN QUEBEC
C9.1: ASPHALT LAYERS

ITEM	DESCRIPTION	UNIT	LI	QUANTITY	RATE	AMOUNT
	TOTAL BROUGHT FORWARD					
C9.1.13	Coring of asphalt layers					
C9.1.13.1	100 mm diameter	No		250		
C9.1.13.2	150 mm diameter	No		175		
C9.1.14	Surface regularity testing as described in Clause A9.1.8.4					
C9.1.14.1	Establishment of equipment: (Inertial laser profilometre)	No		1		
C9.1.14.2	Profiler Surveys utilising equipment as specified - Base layers and surfacing layers	km		6		
TOTAL CARRIED FORWARD TO SUMMARY						

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SCHEDULE C: NEW TIE-IN QUEBEC

C11.7: ROAD MARKINGS AND ROAD STUDS

ITEM	DESCRIPTION	UNIT	LI	QUANTITY	RATE	AMOUNT
C11.7	ROAD MARKINGS AND ROAD STUDS					
C11.7.2	Retro-reflective Road marking:					
C11.7.2.1	White lines broken or unbroken (300mm wide water-borne paint or similar approved)	km	LI	0.50		
C11.7.2.2 (i)	Yellow lines broken or unbroken (300mm wide water-borne paint or similar approved)	km	LI	1.20		
C11.7.2.2 (ii)	Yellow lines broken or unbroken (700mm wide water-borne paint or similar approved)	km	LI	0.25		
C11.7.2.4	White lettering and symbols (water-borne paint or similar approved)	m ²	LI	100		
C11.7.2.5	Yellow lettering and symbols (water-borne paint or similar approved)	m ²	LI	20		
C11.7.2.6	Red lettering and symbols (water-borne paint or similar approved)	m ²	LI	120		
C11.7.2.7	Transverse lines, painted island and arrestor bed markings (any colour as specified) (water-borne paint)	m ²	LI	220		
C11.7.5	Variations in rate of application:					
C11.7.5.1	White paint	/		20		
C11.7.5.2	Yellow paint	/		50		
C11.7.5.4	Retro-reflective beads	kg		100		
C11.7.8	Setting out and premarking the lines (excluding traffic island markings, lettering and symbols)	km	LI	3		
C11.7.9	Re-establishing the painting unit during the defect's notification period and at other instances on instruction of the Engineer	No		1		
TOTAL CARRIED FORWARD TO SUMMARY						

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SCHEDULE C: NEW TIE-IN QUEBEC

C11.8: LANDSCAPING AND PLANTING PLANTS

ITEM	DESCRIPTION	UNIT	LI	QUANTITY	RATE	AMOUNT
C11.8	LANDSCAPING AND PLANTING PLANTS					
C11.8.3	Preparing the areas for grassing:					
C11.8.3.2	Scarifying for loosening topsoil	ha	LI	1		
C11.8.3.3	Topsoiling within the road reserve where the following materials are used:					
(a)	Topsoil obtained from within the road reserve or borrow areas	m³	LI	500		
C11.8.3.5	Providing and applying chemical fertilisers and/or soil-improvement material:					
(b)	Superphosphate	t		5		
(d)	2:3:2 (22)	t		1		
C11.8.4	Grassing					
C11.8.4.3	Hydroseeding:					
(a)	Providing an approved seed mixture for hydroseeding	kg		200		
(c)	Hydroseeding	ha		2		
C11.8.5	Watering the grass when established by topsoiling only	kℓ		500		
TOTAL CARRIED FORWARD TO SUMMARY						

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SCHEDULE C: NEW TIE-IN QUEBEC
C12.7: TRENCHLESS METHODS

ITEM	DESCRIPTION	UNIT	LI	QUANTITY	RATE	AMOUNT
C12.7	TRENCHLESS METHODS					
C12.7.1	Establishment on site for: (indicate type of operation: Horizontal directional drilling)	Lump Sum		1		
C12.7.2	Moving to and setting up equipment at each position for (Installation of electrical pipe ducts)	No		7		
C12.7.3	Installing holes (110mm dia, Upvc indicated) to required length for (installation of electrical pipe ducts)	m		300		
TOTAL CARRIED FORWARD TO SUMMARY						

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COMPLETION OF BRAVO TAXIWAY EXTENSION AT KING SHAKA INTERNATIONAL AIRPORT FOR A
PERIOD OF 12 MONTHS**

**PART A: TENDER NO. KSIA7806/2025/RFP – CIVIL ENGINEERING
SCHEDULE C: NEW TIE-IN QUEBEC
SUMMARY OF SECTIONS**

CHAPTER	DESCRIPTION	FROM PAGE	AMOUNT
C1.6	CLEARING AND GRUBBING	C2-36	R
C1.7	LOADING AND HAULING	C2-37	R
C2.1	GENERAL REQUIREMENTS AND TRENCHING FOR SERVICES	C2-39	R
C2.2	DRY SERVICES	C2-40	R
C3.1	DRAINS	C2-42	R
C3.2	CULVERTS	C2-43	R
C4.2	CUT MATERIALS	C2-44	R
C4.3	EXISTING ROAD MATERIALS	C2-45	R
C4.4	COMMERCIAL MATERIALS	C2-46	R
C5.1	ROADBED	C2-47	R
C5.2	FILL	C2-48	R
C5.3	ROAD PAVEMENT LAYERS	C2-49	R
C5.4	STABILISATION	C2-50	R
C8.1	PRIME COAT	C2-51	R
C9.1	ASPHALT LAYERS	C2-53	R
C11.7	MARKINGS AND STUDS	C2-54	R
C11.8	LANDSCAPING AND PLANTING PLANTS	C2-55	R
C12.7	TRENCHLESS METHODS	C2-56	R
TOTAL CARRIED FORWARD TO TENDER SUMMARY			R

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SCHEDULE D: APRON STAND AND CHANNEL
C1.6: CLEARING AND GRUBBING

ITEM	DESCRIPTION	UNIT	LI	QUANTITY	RATE	AMOUNT
C1.6	CLEARING AND GRUBBING					
C1.6.1	Clearing					
C1.6.1.1	Clearing with machines and some hand labour where necessary	ha		20		
C1.6.2	Grubbing					
C1.6.2.1	Grubbing with machines and some hand labour where necessary	ha		20		
TOTAL CARRIED FORWARD TO SUMMARY						

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SCHEDULE D: APRON STAND AND CHANNEL
C1.7: LOADING AND HAULING

ITEM	DESCRIPTION	UNIT	LI	QUANTITY	RATE	AMOUNT
C1.7	LOADING AND HAULING					
C1.7.1	Loading					
C1.7.1.1	Loading from stockpile using machines and some hand labour where necessary	m ³		250		
C1.7.2	Hauling					
C1.7.2.1	Hauling material for use in the Works and off-loading it on the site of the Works:					
(a)	Soil, gravel, crushed stone and pavement layer material	m ³ - km		10 000		
C1.7.2.2	Hauling material to spoil and off-loading it at a designated spoil or stockpile are:					
(a)	Cleared and grubbed material (organic matter and all other unsuitable or waste material)	m ³ - km		80 000		
(b)	Soil and gravel material	m ³ - km		180 000		
(c)	Boulders, hard material and concrete	m ³ - km		10 000		
TOTAL CARRIED FORWARD TO SUMMARY						

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SCHEDULE D: APRON STAND AND CHANNEL

C2.1: GENERAL REQUIREMENTS AND TRENCHING FOR SERVICES

ITEM	DESCRIPTION	UNIT	LI	QUANTITY	RATE	AMOUNT
C2.1	GENERAL REQUIREMENTS AND TRENCHING FOR SERVICES					
C2.1.2	Existing services, detention and verification					
C2.1.2.5	Using hand excavation to locate, expose and verify services	m ³	LI	100		
C2.1.6	Trench excavation (in soft material) for 16" and 6" Hydrant Fuel Pipelines					
C2.1.6.1	Trenches up to 1.0m wide:					
(a)	Up to 1.0m deep	m ³		1 900		
(b)	Over 1.0m and up to 2.0m deep	m ³		1 650		
(c)	Over 2.0m and up to 3.0m deep	m ³		1 500		
(d)	Over 3.0m and up to 4.0m deep	m ³		500		
C2.1.7	Extra over items C2.1.6, C2.1.8and C2.1.16 for excavating in:					
C2.1.7.1	Hard material irrespective of depth	m ³		750		
C2.1.7.2	Stabilised material irrespective of depth	m ³		780		
C2.1.8	Excavations outside the normal trench profile	m ³		2 500		
C2.1.11	Backfilling of trenches					
C2.1.11.1	Backfill compacted to 93% (100% for sand) of MDD (areas subject to traffic loads) using material:					
(a)	From the excavated trench material	m ³		3 500		
(e)	From commercial sources (G7 Material Compacted to 95% MMD)	m ³		2 000		
(e)	From commercial sources (G5B Material Compacted to 95% MMD)	m ³		350		
C2.1.13.2	Backfilling trenches using soil cement using (state type of material i.e.G5, G7 or G8) compacted to 93% of MDD					
C2.1.13.3 (a)	Backfilling trenches using soil cement using (state type of material i.e.G7) compacted to 97% of MDD	m ³		125		
C2.1.13.4	Cement (state class of cement)	kg		20		
TOTAL CARRIED FORWARD						

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SCHEDULE D: APRON STAND AND CHANNEL

C2.1: GENERAL REQUIREMENTS AND TRENCHING FOR SERVICES

ITEM	DESCRIPTION	UNIT	LI	QUANTITY	RATE	AMOUNT
TOTAL BROUGHT FORWARD						
C2.1.19	Dealing with water during services work					
C2.1.19.1	Dealing with surface water	Lump Sum		1		
C2.1.19.2	Dealing with subsurface water	Lump Sum		1		
C2.1.23	Reinstatement of trenches in existing surfaced roads using:					
C2.1.23.1	Selected material (state material type and source e.g. G8, commercial and layer thickness 150mm) compacted to (state minimum compaction) 93% of MDD	m ³		300		
C2.1.23.1 (a)	Selected material (state material type and source e.g. G7, commercial and layer thickness 150mm) compacted to (state minimum compaction) 95% of MDD	m ³		300		
C2.1.23.1 (b)	Stabilised subbase material (C3 commercial sources and 150mm layer thickness) using (4% percentage cement stabilising agent) compacted to (state minimum compaction) 97% of MDD	m ³		300		
C2.1.23.3	Base material (G2, commercial and 150mm layer thickness) compacted to (Minimum compaction 102 % for G2) % of MDD	m ³		50		
C2.1.23.4	Prime coat (MC - 30 cut-back bitumen (Application Rate 0,7l/m ²))	m ²		250		
C2.1.23.5	Tack coat (Stable grade 60% net bitumen emulsion as specified)	m ²		250		
C2.1.23.6	Asphalt material (Sand skeletal mix - continuously graded asphalt as defined (50mm layer thickness, Sa-E14 - A-P1 Modified Binder (PG64E-16), design class/level III and placing technique paver) (NMPS 14mm))	t		40		
C2.1.23.7 (a)	Asphalt material (Sand skeletal mix - high modulus asphalt (Class II EME) (120mm layer thickness, 10-20 Penetration Grade Bitumen, design class (Sabita Manual 33) and placing technique paver) (NMPS 14mm) (Constructed in 2 lifts))	t		65		
C2.1.23.7 (b)	Saw-cutting materials (asphalt surfacing and base) to an average depth: to an average depth:					
C2.1.24.3	(a) Not exceeding 50 mm	m		150		
	(b) Exceeding 50 mm but not exceeding 100 mm	m		150		
	(c) Exceeding 100 mm but not exceeding 150 mm	m		150		
TOTAL CARRIED FORWARD						

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SCHEDULE D: APRON STAND AND CHANNEL

C2.1: GENERAL REQUIREMENTS AND TRENCHING FOR SERVICES

ITEM	DESCRIPTION	UNIT	LI	QUANTITY	RATE	AMOUNT
	TOTAL BROUGHT FORWARD					
C2.1.27	Demolition of existing manholes, access chambers and other service structures consisting of:					
C2.1.27.1	Unreinforced concrete	m ³		130		
C2.1.27.2	Reinforced concrete	m ³		225		
C2.1.27.3	Masonry	m ³		225		
	Manholes, valve and hydrant chambers etc. for fuel lines					
PSC2.3.31.3	Decommissioning of existing pipeline section					
(a)	Bentonite-cement grouting of existing pipeline	m		264		
PSC2.3.32	DEMOLITION OF PIPEWORK AND ANCILLARIES – FUEL LINES					
PSC2.3.32.1	Demolition of Piping and Equipment (Night Works)					
	All of the works covered in this section are to be carried out as night works (22:00 to 04:00) Rate to include all additional costs including, but not limited to, lighting costs, power supply/generators etc. Rate to include all materials, plant and labour costs for the removal of piping and equipment at existing stations i.e. cold-cutting of existing pipeline, lifting out of existing valve assemblies and associated piping, transport and delivery to the Employer's storage premises					
(a)	Draining and purging of Existing Pipeline : VC6 to VC7, including all fittings (Ø16", 600m)	Lump Sum	LI	1		
(b)	Cut pipe at 50m intervals or less to facilitate Bentonite-cement grouting of Existing Pipeline : Tie-in point #1 to Tie-in point #2	No.	LI	5		
(c)	Removal of 16" Pipe incl. labour, materials, etc. required to cold-cut and lift out piping, transport and delivery to the Employer's storage premises Lengths measured through fittings	m	LI	250		
TOTAL CARRIED FORWARD						

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SCHEDULE D: APRON STAND AND CHANNEL

C2.1: GENERAL REQUIREMENTS AND TRENCHING FOR SERVICES

ITEM	DESCRIPTION	UNIT	LI	QUANTITY	RATE	AMOUNT
	TOTAL BROUGHT FORWARD					
(d)	Demolition of Stations					
(d)(i)	Demolition of Existing LP 7	Lump Sum	LI	1		
(d)(ii)	Demolition of Existing HP 6	Lump Sum	LI	1		
(d)(iii)	Demolition of Partially Constructed HP 6	Lump Sum	LI	1		
d(iv)	Demolition of VC 13	Lump Sum	LI	1		
PSC2.3.32.2	Demolition of Pipeline and Equipment (Normal Hours)					
	All of the works in this section are to be carried out during normal working hours. Rate to include all materials, plant and labour costs for the removal of piping and equipment at existing stations i.e. cold-cutting of existing pipeline, lifting out of existing valve assemblies and associated piping, transport and delivery to the Employer's storage premises					
(i)	Demolition of Stations					
	Demolition of LP 11	Lump Sum	LI	1		
	Demolition of Pit Valve 1	Lump Sum	LI	1		
	Demolition of Pit Valve 2	Lump Sum	LI	1		
	Demolition of Pit Valve 3	Lump Sum	LI	1		
	Demolition of Pit Valve 4	Lump Sum	LI	1		
	Demolition of Pit Valve 5	Lump Sum	LI	1		
	Demolition of Pit Valve 6	Lump Sum	LI	1		
	Demolition of Pit Valve 7	Lump Sum	LI	1		
	Demolition of Pit Valve 8	Lump Sum	LI	1		
(ii)	Removal of 16" Pipe sections incl. labour, materials, etc. required to cold-cut and lift out piping, transport and delivery to the Employer's storage premises Length measured through fittings	m	LI	250		
TOTAL CARRIED FORWARD TO SUMMARY						

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SCHEDULE D: APRON STAND AND CHANNEL
C2.2: DRY SERVICES

ITEM	DESCRIPTION	UNIT	LI	QUAN TITY	RATE	AMOUNT
C2.2	DRY SERVICES					
C2.2.8	Covers and frames for duct handholes, manholes and access chambers					
C2.2.8.1	Electrical Chambers, strength class 25mpa and 3m x 3m cover and frame - Type H Pit Cover	No		10		
C2.2.8.2	Electrical Chambers, strength class 25mpa and 2.14m x 2.14m cover and frame - Type H Pit Cover	No		12		
C2.2.8.3	Electrical Chambers, strength class 25mpa and 6m x 3m cover and frame - Type H Pit Cover	No		4		
C2.2.8.4	Mechanical Chambers - covers and frames as per detailed drawings	No		13		
C2.2.9.4	Rasing of masonry walls of existing manholes	m2		150		
	Manholes, valve and hydrant chambers etc. for fuel lines					
C2.2/C3.2.16	Brickwork (Engineering bricks):					
C2.2/C3.2.16.1	115 mm thick	m ²		100		
C2.2/C3.2.16.2	230 mm thick	m ²		150		
C2.2/C2.17	Plaster	m ²		300		
C2.2/C13.2.1	Formwork to provide (class F1) surface finish to (Chambers, outlet structures, skewed ends, catchpits, manholes, thrust and anchor blocks)					
(a)	Vertical formwork for F1 surface finish	m ²		550		
(b)	Horizontal formwork for f1 surface finish	m ²		100		
C2.2/C13.3.1.1	Chambers, outlet structures, skewed ends, catchpits, manholes, thrust and anchor blocks					
(a)	Mild-steel bars	t		3		
(b)	High-yield-stress-steel bars	t		25		
C2.2/C13.4.1.1	Strength concrete (class C):					
(a)	Chambers, outlet structures, skewed ends, catchpits, manholes, thrust and anchor blocks - C25/30-19	m ³		239		
(b)	In class A bedding, screeds, cradle and the encasing for pipes, including formwork - C20/25-19	m ³		250		
PSC2.2.12	Waterproofing of Chambers, outlet structures, skewed ends, catchpits, manholes, thrust and anchor blocks as per detailing drawing KSIA-MECH-GA-008	m ²		500		
PSC2.2.13	Supply and install stainless steel gratings as per detail drawing KSIA-MECH-GA-008	m		20		
TOTAL CARRIED FORWARD TO SUMMARY						

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SCHEDULE D: APRON STAND AND CHANNEL
C4.2: CUT MATERIALS

ITEM	DESCRIPTION	UNIT	LI	QUANTITY	RATE	AMOUNT
C4.2	CUT MATERIALS					
C4.2.3	Excavating of materials in cuttings, material obtained from					
C4.2.3.1	Soft excavation	m3		20 000		
C4.2.3.2	Boulder excavation class A	m3		500		
C4.2.3.3	Boulder excavation class B	m3		500		
C4.2.3.4	Hard excavation (other than by blasting)	m3		1 500		
C4.2.7	Removal of unsuitable stable cut material to spoil					
C4.2.7.1	In layer thicknesses of 200 mm and less	m3		200		
C4.2.7.2	In layer thicknesses exceeding 200 mm	m3		200		
C4.2.12	Finishing the side slopes					
C4.2.12.1	Cuttings:					
	In soft material	m2		2 000		
PSC4.2.13	Dewatering excavations throughout the earthworks and fill operations by means of pumping	Lump Sum		1		
TOTAL CARRIED FORWARD TO SUMMARY						

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SCHEDULE D: APRON STAND AND CHANNEL
C4.4: COMMERCIAL MATERIALS

ITEM	DESCRIPTION	UNIT	LI	QUANTITY	RATE	AMOUNT
C4.4	COMMERCIAL MATERIALS					
C4.4.2	Commercial materials identified by the Contractor from commercial, private or other non-commercial suppliers					
C4.4.2.1	Pavement layer material:					
(h)	Type G7 material (for shoulder make up)	m ³		250		
C4.4.2.5	Fill material in the earthworks:					
(a)	Normal or coarse fill	m ³		12 500		
TOTAL CARRIED FORWARD TO SUMMARY						

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SCHEDULE D: APRON STAND AND CHANNEL
C5.2: FILL

ITEM	DESCRIPTION	UNIT	LI	QUANTITY	RATE	AMOUNT
C5.2	FILL					
C5.2.2	Fill construction					
C5.2.2.1	Normal fill material in compacted layer thicknesses of 200 mm and less:					
(a)	Compacted to 90% MDD	m ³		12 500		
C5.2.5.2	Fill material in sidewalk & shoulders compacted to 93% of MDD using labour enhanced methods of construction and light hand equipment	m ³		250		
C5.2.11	Finishing off fill slopes, medians and interchange areas					
C5.2.11.1	Fill slopes	m ²		2 000		
TOTAL CARRIED FORWARD TO SUMMARY						

**TENDER NO: KSIA7806/2025/RFP - PROCUREMENT OF A CIDB GRADE 9 CE CONTRACTOR THE
COMPLETION OF BRAVO TAXIWAY EXTENSION AT KING SHAKA INTERNATIONAL AIRPORT FOR A
PERIOD OF 12 MONTHS**

**PART A: TENDER NO. KSIA7806/2025/RFP – CIVIL ENGINEERING
SCHEDULE D: APRON STAND AND CHANNEL
SUMMARY OF SECTIONS**

CHAPTER	DESCRIPTION	FROM PAGE	AMOUNT
C1.6	CLEARING AND GRUBBING	C2-58	R
C1.7	LOADING AND HAULING	C2-59	R
C2.1	GENERAL REQUIREMENTS AND TRENCHING FOR SERVICES	C2-63	R
C2.2	DRY SERVICES	C2-64	R
C4.2	CUT MATERIALS	C2-65	R
C4.4	COMMERCIAL MATERIALS	C2-66	R
C5.2	FILL	C2-67	R
TOTAL CARRIED FORWARD TO TENDER SUMMARY			R

**TENDER NO: KSIA7806/2025/RFP - PROCUREMENT OF A CIDB GRADE 9 CE CONTRACTOR THE
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PERIOD OF 12 MONTHS**

**PART A: TENDER NO. KSIA7806/2025/RFP – CIVIL ENGINEERING
FINAL SUMMARY OF SECTIONS**

SCHEDULE	DESCRIPTION	FROM PAGE	AMOUNT
SCHEDULE A	PRELIMINARY AND GENERAL	C2-17	
SCHEDULE B	BRAVO TAXIWAY	C2-35	
SCHEDULE C	NEW TIE-IN QUEBEC	C2-57	
SCHEDULE D	APRON STAND AND CHANNEL	C2-68	
TOTAL CARRIED FORWARD TO FINAL TENDER SUMMARY			R

TENDER NO: KSIA7806/2025/RFP - PROCUREMENT OF A CIDB GRADE 9 CE CONTRACTOR FOR THE COMPLETION OF BRAVO TAXIWAY EXTENSION AT KING SHAKA INTERNATIONAL AIRPORT FOR A PERIOD OF 12 MONTHS AT KING SHAKA INTERNATIONAL AIRPORT

SCHEDULE A: PRELIMINARY AND GENERAL
P&G: PRELIMINARY AND GENERAL

ITEM	DESCRIPTION	UNIT	LI	QUANTITY	RATE	AMOUNT
P&G	PRELIMINARY AND GENERAL					
1	FIXED CHARGE ITEMS	Lump Sum		1		
2	TIME-RELATED ITEMS	Months		12		
TOTAL CARRIED FORWARD TO SUMMARY						

**TENDER NO: KSIA7806/2025/RFP - PROCUREMENT OF A CIDB GRADE 9 CE CONTRACTOR THE
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PERIOD OF 12 MONTHS**

**PART B: TENDER NO. KSIA7806/2025/RFP – ELECTRICAL ENGINEERING
SCHEDULE A: PRELIMINARY AND GENERAL
SUMMARY OF SECTIONS**

CHAPTER	DESCRIPTION	FROM PAGE	AMOUNT
P & G	PRELIMINARY AND GENERAL	C2-71	R
TOTAL CARRIED FORWARD TO TENDER SUMMARY			R

TENDER NO: KSIA7806/2025/RFP - PROCUREMENT OF A CIDB GRADE 9 CE CONTRACTOR FOR THE COMPLETION OF BRAVO TAXIWAY EXTENSION AT KING SHAKA INTERNATIONAL AIRPORT FOR A PERIOD OF 12 MONTHS AT KING SHAKA INTERNATIONAL AIRPORT

SCHEDULE B: BRAVO TAXIWAY

SECTION ONE: LOW VOLTAGE AND MEDIUM VOLTAGE CABLE

ITEM	DESCRIPTION	UNIT	LI	QUANTITY	RATE	AMOUNT
SECTION ONE	LOW VOLTAGE AND MEDIUM VOLTAGE CABLE Note: Item Number Reference to be read in Conjunction with detail Electrical Specification in Part C3.2 of Volume 3.					
2.1.1	Supply and install of PILC, SWA, PVC, table 26, 11 kV cable with copper conductors:					
2.1.1.1	150mm ² , 3-core	m		550		
2.1.1.2	185mm ² , 3-core	m		100		
2.1.1.3	Terminate PILC, SWA, PVC, table 26, 11 kV cable with copper conductors	m		1		Rate Only
2.1.1.4	150mm ² , 3-core	m		4		
2.1.1.5	185mm ² , 3-core	m		4		
2.1.1.6	Joint PILC, SWA, PVC, table 26, 11 kV cable with copper conductors					
2.1.1.7	150mm ² , 3-core	m		3		
2.1.1.8	185mm ² , 3-core	m		1		
2.1.2	Supply and install of PVC, PVC, SWA, PVC low voltage cable with copper conductors:					
2.1.2.1	10mm ² , 3-core	m		255		
2.1.2.2	35mm ² , 4-core	m		160		
2.1.2.3	50mm ² , 4-core	m		1		
2.1.2.4	70mm ² , 4-core	m		500		
2.1.2.5	185mm ² , 4-core	m		150		
2.1.2.6	Supply and install the following:					
2.1.2.7	12 Core Single Mode Fibre Optic Cable, Tower to CCR Room	m		1		Rate Only
2.1.2.8	Splice & terminate Fibre Optic Cable for fibre from Tower to CCR Room	No		1		Rate Only
2.1.2.9	Terminate PVC, PVC, SWA, PVC low voltage cable with copper conductors:					
TOTAL CARRIED FORWARD						

TENDER NO: KSIA7806/2025/RFP - PROCUREMENT OF A CIDB GRADE 9 CE CONTRACTOR FOR THE COMPLETION OF BRAVO TAXIWAY EXTENSION AT KING SHAKA INTERNATIONAL AIRPORT FOR A PERIOD OF 12 MONTHS AT KING SHAKA INTERNATIONAL AIRPORT

SCHEDULE B: BRAVO TAXIWAY

SECTION ONE: LOW VOLTAGE AND MEDIUM VOLTAGE CABLE

ITEM	DESCRIPTION	UNIT	LI	QUANTITY	RATE	AMOUNT
	TOTAL BROUGHT FORWARD					
	Note: Item Number Reference to be read in Conjunction with detail Electrical Specification in Part C3.2 of Volume 3.					
2.1.2.10	10mm ² , 3-core	No		26		
2.1.2.11	35mm ² , 4-core	No		10		
2.1.2.12	50mm ² , 4-core	No		5		
2.1.2.13	70mm ² , 4-core	No		20		
2.1.2.14	185mm ² , 4-core	No		40		
2.1.2.15	Supply and install earth continuity conductor:					
2.1.2.16	10mm ² , 3-core	m		255		
2.1.2.17	35mm ² , 4-core	m		610		
2.1.2.18	70mm ² , 4-core	m		1		Rate Only
2.1.2.19	95mm ² , 4-core	m		700		
2.1.2.20	Terminate complete with Lugs					
2.1.2.21	10mm ² , 3-core	No		26		
2.1.2.22	35mm ² , 4-core	No		10		
2.1.2.23	70mm ² , 4-core	No		1		Rate Only
2.1.2.24	95mm ² , 4-core	No		42		
2.1.2.25	Allow for labelling of all LV and MV cables thorough out the installation	Sum		1		
TOTAL CARRIED FORWARD TO SUMMARY						

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SCHEDULE B: BRAVO TAXIWAY

SECTION TWO: MINIATURE SUBSTATIONS AND EARTHING

ITEM	DESCRIPTION	UNIT	LI	QUANTITY	RATE	AMOUNT
SECTION TWO	MINIATURE SUBSTATIONS AND EARTHING Note: Item Number Reference to be read in Conjunction with detail Electrical Specification in Part C3.2 of Volume 3.					
2.1.3	Supply 11000/420/240 Volt miniature substations with SF6RMU: Test and Commission installed 500KVA Miniature Substations					
2.1.3.1	Install, test and commission miniature substations:					
2.1.3.1.1	500 kVA	No		2		
2.1.3.2	Supply miniature substation plinths					
2.1.3.2.1	500 kVA	No		2		Rate Only
2.1.3.3	Install miniature substation plinths					
2.1.3.3.1	500 kVA	No		2		Rate Only
2.1.3.4	Supply and install Earthing of miniature substations	No		2		
2.1.3.5	Extra over for the supply and installation of additional 1,8 m earth spikes including clamps for the connection of earth conductor	No		1		
2.1.3.6	Earthing tests	No		2		
TOTAL CARRIED FORWARD TO SUMMARY						

TENDER NO: KSIA7806/2025/RFP - PROCUREMENT OF A CIDB GRADE 9 CE CONTRACTOR FOR THE COMPLETION OF BRAVO TAXIWAY EXTENSION AT KING SHAKA INTERNATIONAL AIRPORT FOR A PERIOD OF 12 MONTHS AT KING SHAKA INTERNATIONAL AIRPORT

SCHEDULE B: BRAVO TAXIWAY

SECTION THREE: AIRFIELD GROUND LIGHTING SYSTEM TAXIWAYS BRAVO LUMINAIRES

ITEM	DESCRIPTION	UNIT	LI	QUANTITY	RATE	AMOUNT
SECTION THREE	AIRFIELD GROUND LIGHTING SYSTEM TAXIWAYS BRAVO LUMINAIRES Note: Item Number Reference to be read in Conjunction with detail Electrical Specification in Part C3.2 of Volume 3.					
4.1	TAXIWAY LUMINAIRES					
4.1.1	Supply and install 8" Bi-directional low intensity LED (L-861 T) Taxiway Edge luminaires complete with blue lens, transformers, primary connector kits, secondary connector kits, terminations					
4.1.2	Elevated (Complete with shallow base can and base plate)	No		80		
4.1.3	Inset (Complete with shallow base can)	No		1		Rate Only
4.1.4	Disconnect and remove existing Taxiway Edge luminaires including base plate, transformers, primary connector kits, secondary connector kits and re-joint the primary cables in the manhole to complete the circuit and submit to client's storage facility					
4.1.5	Elevated	No		50		
4.1.6	Inset	No		21		
4.1.7	Supply and install constant current regulator as per the current Denel manufactured units, complete with earth and lamp fault detection's, series circuit plug in, valvetrabs, dual interface connections and control cabling connections					
4.1.8	15kW	No		2		
4.1.9	80A 2 pole circuit breaker complete with all accessories	No		2		
4.1.10	Inspection and test certificates for all the luminaire installed as listed in this BoQ	Sum		1		
4.1.11	Supply and install 8" deep can type L867 for housing series transformers complete with cover plate and 800 X 800 X 200 Thick concrete plinth/slab	No		1		
TOTAL CARRIED FORWARD						

TENDER NO: KSIA7806/2025/RFP - PROCUREMENT OF A CIDB GRADE 9 CE CONTRACTOR FOR THE COMPLETION OF BRAVO TAXIWAY EXTENSION AT KING SHAKA INTERNATIONAL AIRPORT FOR A PERIOD OF 12 MONTHS AT KING SHAKA INTERNATIONAL AIRPORT

SCHEDULE B: BRAVO TAXIWAY

SECTION THREE: AIRFIELD GROUND LIGHTING SYSTEM TAXIWAYS BRAVO LUMINAIRES

ITEM	DESCRIPTION	UNIT	LI	QUANTITY	RATE	AMOUNT
	TOTAL BROUGHT FORWARD					
4.1.12	Note: Item Number Reference to be read in Conjunction with detail Electrical Specification in Part C3.2 of Volume 3. Supply and install 8" deep can type L868 for housing series transformers complete with 800 X 800 X 200 Thick concrete plinth/slab	No		1		Rate Only
4.1.13	Supply and install 800X800X200 Thick concrete plinth/slab for 8" shallow base can	No		1		
4.2	RUNWAY EDGE LUMINAIRES (NIGHT WORKS)					
4.2.1	Disconnect and remove existing Runway Edge luminaires including transformers, primary connector kits, secondary connector kits and base can and submit to client's storage facility					
4.2.1.1	Elevated	No		2		
4.2.1.2	Inset	No		1		
4.2.2	Supply and install 8" Bi-directional high intensity LED Runway Edge luminaires complete with Clear/Clear lens, transformers, complete with Clear/Clear lens, transformers, primary connector kits, secondary connector kits, terminations					
4.2.2.1	Elevated (Complete with shallow base can and base plate)	No		1		
4.2.2.2	Inset (Complete with shallow base can)	No		2		
	NOTE: All CCR's must have the ability to control both Halogen and LED type fixtures to ensure that future upgrades on the AGL from halogen to LED will not impact on the substation hardware or require new transformers.					
TOTAL CARRIED FORWARD TO SUMMARY						

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**SCHEDULE B: BRAVO TAXIWAY
SECTION FOUR: ILLUMINATED SIGNS**

ITEM	DESCRIPTION	UNIT	LI	QUANTITY	RATE	AMOUNT
SECTION FOUR	Note: Item Number Reference to be read in Conjunction with detail Electrical Specification in Part C3.2 of Volume 3. ILLUMINATED SIGNS					
4.9	Supply and install illuminated LED signs complete with transformers, primary connector kits, secondary connector kits and concrete base/plinth:					
4.9.1	a) 700 x 1150mm	No		10		
4.9.2	b) 700 x 1600mm	No		6		
4.9.3	c) 700 x 2100mm	No		13		
4.9.4	d) 700 x 2500mm	No		4		
4.9.5	e) 700 x 2650mm	No		2		
4.9.6	f) 900 x 3000mm	No		2		
4.9.7	g) 900 x 2100mm	No		2		
4.9.8	h) 900 x 1150mm	No		2		
4.9.9	Supply and install illuminated LED signs for stands complete with concrete base/plinth and steel pole structure:	No		13		
TOTAL CARRIED FORWARD TO SUMMARY						

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**SCHEDULE B: BRAVO TAXIWAY
SECTION FIVE: APRON LIGHTING**

ITEM	DESCRIPTION	UNIT	LI	QUANTITY	RATE	AMOUNT
SECTION FIVE	Note: Item Number Reference to be read in Conjunction with detail Electrical Specification in Part C3.2 of Volume 3. APRON LIGHTING					
4.10.2.1	Reduce Height of 1 existing 30 metre High Mast Pole and redesign top end to house platform and floodlights	No		1		
4.10.2.2	Supply and install luminaires to the TITAN 720 type as required by ACSA on each High Mast	No		4		
4.10.2.3	Supply and install 3CR12 powder coated LV Kiosks as specified at the base of each of the high masts, complete with the lighting control gear installed.	No		3		Rate Only
4.10.2.4	Supply and install low intensity, omni-directional obstruction lights, complying with FAA: L-810 AC 150/5345-46 43 or FAA: L-810 AC 150/5345-43, mounted on a bracket at the top of the mast.	No		3		Rate Only
TOTAL CARRIED FORWARD TO SUMMARY						

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SCHEDULE B: BRAVO TAXIWAY

SECTION SIX: AIRFIELD LIGHTING CONTROL AND MONITORING EQUIPMENT

ITEM	DESCRIPTION	UNIT	LI	QUANTITY	RATE	AMOUNT
SECTION SIX	Note: Item Number Reference to be read in Conjunction with detail Electrical Specification in Part C3.2 of Volume 3. AIRFIELD LIGHTING CONTROL AND MONITORING EQUIPMENT					
4.11.2.1	Upgrade(re-programme) and commission the complete control and monitoring system including all the Hardware and Software associated with the CCR	Sum		1		Rate Only
4.11.2.2	Terminate (splicing) of optical fibre cable	No		1		
4.11.2.3	Training courses (including manuals) complete with attendance certificates	Sum		1		
4.11.2.4	Test and commissioning of system complete with certificates	Sum		1		
TOTAL CARRIED FORWARD TO SUMMARY						

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**SCHEDULE B: BRAVO TAXIWAY
SECTION SEVEN: AIRFIELD CABLE**

ITEM	DESCRIPTION	UNIT	LI	QUANTITY	RATE	AMOUNT
SECTION SEVEN	AIRFIELD CABLE					
	Note: Item Number Reference to be read in Conjunction with detail Electrical Specification in Part C3.2 of Volume 3.					
4.12.2.1	Supply and install 6 mm ² Tinned Stranded CU conductor, XLPE, CU taped screened, HDPE, 2800/5000 Volts, series primary airfield cable (Various Colours)	m		32 000		
4.12.2.2	Supply and install 6 mm ² Tinned Flexible CU conductor, PE, tinned CU braid, FRPVC, 5000 Volt, series primary airfield cable:	m		1		
4.12.2.2.1	Terminate 6 mm ² primary cable complete with connector kits	No		365		
4.12.2.2.2	Supply and install 4mm ² rubber/neoprene secondary airfield cable:	m		2 515		
4.12.4	Terminate 4 mm ² secondary cable complete with connector kits	No		365		
4.12.4.1	Test and issue primary cable and secondary cable test certificate for installation	Sum		1		
4.18	Supply and install cable sleeves:					
4.18.1	25 mm O.D (including couplers)	m		1		Rate Only
4.18.2	32 mm O.D (including couplers)	m		1		Rate Only
4.18.3	110 mm O.D (including couplers)	m		1		Rate Only
4.18.4	90 Degree T pieces for 110 mm O.D Sleeve with caps to house 25mm O.D Sleeve	No		1		Rate Only
4.18.5	Auger drilling	m		300		
4.18.6	Excavate in all materials for trenches, backfill, compact and dispose of surplus material	m ³		400		
4.18.7	Extra over for excavating in hard materials	m ³		40		
4.18.8	Extra over for excavating by hand in all materials	m ³		40		
TOTAL CARRIED FORWARD						

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**SCHEDULE B: BRAVO TAXIWAY
SECTION SEVEN: AIRFIELD CABLE**

ITEM	DESCRIPTION	UNIT	LI	QUANTITY	RATE	AMOUNT
	TOTAL BROUGHT FORWARD					
4.18.9	Note: Item Number Reference to be read in Conjunction with detail Electrical Specification in Part C3.2 of Volume 3. Extra over for using backfill material obtained from:					
4.18.10	Borrow areas	m ³		20		
4.18.11	Source provided by the contractor	m ³		20		
4.18.12	Allow for labelling of all primary and secondary cables throughout the installation	Sum		1		
4.18.13	Cut Slots into existing Asphalt for secondary cables installation and reinstate Asphalt	m ²		11		
4.18.14	Concrete Manhole as per detail drawing	No		2		
TOTAL CARRIED FORWARD TO SUMMARY						

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SCHEDULE B: BRAVO TAXIWAY
SECTION EIGHT: EARTHING

ITEM	DESCRIPTION	UNIT	LI	QUANTITY	RATE	AMOUNT
SECTION EIGHT	Note: Item Number Reference to be read in Conjunction with detail Electrical Specification in Part C3.2 of Volume 3. EARTHING					
4.19.1	Provide an instrument earthing system for the CCR 's	Sum		1		Rate Only
4.19.2	Carry out Earth resistivity testing through the site prior to commencement of installation	Sum		1		
4.19.3	Earth testing of complete system complete with certificates	Sum		1		
4.19.4	Supply and install 1 200mm earth rods:	No		83		
4.19.5	Supply and install (earth counterpoise) continuity conductor: 16mm ² BCEW	m		8 900		
4.19.6	Terminate and connect earth continuity conductor to earth rods complete with lugs:	No		155		
TOTAL CARRIED FORWARD TO SUMMARY						

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SCHEDULE B: BRAVO TAXIWAY
SECTION NINE: GENERATORS

ITEM	DESCRIPTION	UNIT	LI	QUANTITY	RATE	AMOUNT
SECTION NINE	Note: Item Number Reference to be read in Conjunction with detail Electrical Specification in Part C3.2 of Volume 3. GENERATORS					
9.1	Supply, deliver, install and commission diesel generator sets in weatherproof enclosure complete, as specified including changeover panels, tools etc. (refer to generator spec in electrical specifications)					
9.1.1	500 kVA, 420V Prime rated diesel generator set with Day tank	No		2		Rate Only
9.1.2	All applicable warning signs and labelling in accordance with the latest edition of SANS 1186	No		2		
9.2	Test, Major Service, Install batteries and commission system together with the issuing of reports and certificates	No		2		
9.3	Supply, deliver, install and commission the Control and Change Over Kiosk complete, as specified including changeover panels, Circuit Breakers, supply cables from Generator and Miniature substation etc. as required on site	No		2		
9.4	3 Year Service Plan for the existing 2 x 500KVA Diesel Generators on site. Service to include 3 x Minor/Quarterly checks per set per year and 1 x Major Service/Annual service per set per year including replacement of all fuel, oil and water filters, oil sample analysis, battery testing. 50/50 premix water additive, lube oil, cleaning of generator consumable and all travel and labour	No		2		
TOTAL CARRIED FORWARD TO SUMMARY						

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SCHEDULE B: BRAVO TAXIWAY
SECTION TEN: GENERAL

ITEM	DESCRIPTION	UNIT	LI	QUANTITY	RATE	AMOUNT
SECTION TEN	Note: Item Number Reference to be read in Conjunction with detail Electrical Specification in Part C3.2 of Volume 3. GENERAL					
10.1	Disconnection and removal of existing equipment	Prov Sum		11 500	1	11 500
10.2	Supply airfield radios for communication	No		10		
10.3	Supply and installation of 20mm I.D. flexible conduit (connect signs to PVC)	m		12		
10.4	Supply two sets of tools required to maintain the installation NOTE: All communication protocols between standalone systems and products supplied must be open and have the ability to integrate into alternative systems and products. This includes communication between Control Systems, Substation Equipment (CCR's) and AGL equipment.	Sum		1		
10.5	SPARES					
10.6	Supply and deliver the following recommended spares: (Tenderer to list and price)	PC Sum		30 000	1	30 000
11	Cable Trays, Ladders, Racks and Associated Fixing Materials					
11.1	(i) Cable Racking for manholes					
11.1.1	Supply and Install Galvanised, 300mm Heavy Duty Cable Tray Including Support Brackets, Bends, T-pieces and Accessories. Price Shall Include for Joints, M8 Galvanized Treaded Rod, Nutsm Locknuts, Washer, Long Wedge Anchors, Drilling into Concrete and Other Materials Required to Complete the Installation. (300mm x 75mm)	m		49		
TOTAL CARRIED FORWARD TO SUMMARY						

TENDER NO: KSIA7806/2025/RFP - PROCUREMENT OF A CIDB GRADE 9 CE CONTRACTOR THE COMPLETION OF BRAVO TAXIWAY EXTENSION AT KING SHAKA INTERNATIONAL AIRPORT FOR A PERIOD OF 12 MONTHS

PART B: TENDER NO. KSIA7806/2025/RFP – ELECTRICAL ENGINEERING
SCHEDULE B: BRAVO TAXIWAY
SUMMARY OF SECTIONS

CHAPTER	DESCRIPTION	FROM PAGE	AMOUNT
SECTION 1	LOW VOLTAGE & MEDIUM VOLTAGE CABLES	C2-74	R
SECTION 2	MINIATURE SUBSTATIONS AND EARTHING	C2-75	R
SECTION 3	AIRFIELD GROUND LIGHTING SYSTEM	C2-77	R
SECTION 4	ILLUMINATED SIGNS	C2-78	R
SECTION 5	APRON LIGHTING	C2-79	R
SECTION 6	AIRFIELD LIGHTING CONTROL AND MONITORING EQUIPMENT	C2-80	R
SECTION 7	AIRFIELD CABLE	C2-82	R
SECTION 8	EARTHING	C2-83	R
SECTION 9	GENERATORS	C2-84	R
SECTION 10	GENERAL	C2-85	R
TOTAL CARRIED FORWARD TO TENDER SUMMARY			R

TENDER NO: KSIA7806/2025/RFP - PROCUREMENT OF A CIDB GRADE 9 CE CONTRACTOR FOR THE COMPLETION OF BRAVO TAXIWAY EXTENSION AT KING SHAKA INTERNATIONAL AIRPORT FOR A PERIOD OF 12 MONTHS AT KING SHAKA INTERNATIONAL AIRPORT

SCHEDULE C: NEW TIE-IN QUEBEC

SECTION ONE: AIRFIELD GROUND LIGHTING SYSTEM QUEBEC LINK LUMINAIRES (NIGHT WORKS)

ITEM	DESCRIPTION	UNIT	LI	QUANTITY	RATE	AMOUNT
SECTION ONE	Note: Item Number Reference to be read in Conjunction with detail Electrical Specification in Part C3.2 of Volume 3. AIRFIELD GROUND LIGHTING SYSTEM QUEBEC LINK LUMINAIRES (NIGHT WORKS) Supply and install 8" Bi-directional low intensity LED (L-861 T) Taxiway Edge luminaires complete with blue lens, transformers, primary connector kits, secondary connector kits, terminations					
4.1.1	Supply and install 8" Bi-directional low intensity LED (L-861 T) Taxiway Edge luminaires complete with blue lens, transformers, primary connector kits, secondary connector kits, terminations					
4.1.2	Elevated (Complete with shallow base can and base plate)	No		20		
4.1.3	Inset (Complete with shallow base can)	No		1		Rate Only
4.3	STOPBAR LUMINAIRES Supply and install 8" Uni-directional high intensity LED Stopbar luminaires complete with red lens, transformers, primary connector kits, secondary connector kits, terminations					
4.3.1	Supply and install 8" Uni-directional high intensity LED Stopbar luminaires complete with red lens, transformers, primary connector kits, secondary connector kits, terminations					
4.3.2	Elevated (Complete with shallow base can and base plate)	No		1		
4.3.3	Inset (Complete with shallow base can)	No		14		
4.3.4	Supply and install constant current regulator as per the current Denel manufactured units, complete with earth and lamp fault detection's, series circuit plug in, valvetrabs, dual interface connections and control cabling connections					
4.3.5	4kW	No		2		
4.3.6	40A 2 pole circuit breaker complete with all accessories	No		2		
4.3.6	Core drilling into asphalt for luminaire shallow bases	No		15		
4.6	LEAD ON LUMINAIRES Supply and install 8" Uni-directional medium intensity LED Lead On luminaires complete with green lens, transformers, primary connector kits, secondary connector kits, terminations					
4.6.1	Supply and install 8" Uni-directional medium intensity LED Lead On luminaires complete with green lens, transformers, primary connector kits, secondary connector kits, terminations					
4.6.3	Inset (Complete with shallow base can)	No		15		
TOTAL CARRIED FORWARD						

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SCHEDULE C: NEW TIE-IN QUEBEC

SECTION ONE: AIRFIELD GROUND LIGHTING SYSTEM QUEBEC LINK LUMINAIRES (NIGHT WORKS)

ITEM	DESCRIPTION	UNIT	LI	QUANTITY	RATE	AMOUNT
	TOTAL BROUGHT FORWARD					
	Note: Item Number Reference to be read in Conjunction with detail Electrical Specification in Part C3.2 of Volume 3.					
4.6.4	Supply and install constant current regulator as per the current Denel manufactured units, complete with earth and lamp fault detection's, series circuit plug in, valvetrabs, dual interface connections and control cabling connections					
4.6.5	4kW	No		2		
4.3.6	40A 2 pole circuit breaker complete with all accessories	No		2		
4.6.6	Core drilling into asphalt for luminaire shallow bases	No		16		
4.5	RUNWAY GUARD LUMINAIRES					
4.5.1	Supply and install with high intensity LED Runway Guard lights complete with transformers, primary connector kits, secondary connector kits, terminations					
4.5.2	Elevated (Complete with shallow base can and base plate)	No		2		
4.5.3	Inset (Complete with shallow base can)	No		1		
4.5.4	Supply and install constant current regulator as per the current Denel manufactured units, complete with earth and lamp fault detection's, series circuit plug in, valvetrabs, dual interface connections and control cabling connections					
4.5.5	4kW	No		1		
4.3.6	40A 2 pole circuit breaker complete with all accessories	No		1		
4.5.6	Core drilling into asphalt for luminaire shallow bases	No		2		
4.5.7	Supply and install 800X800X200 Thick concrete plinth/slab for 8" shallow base can	No		1		
	NOTE: All CCR's must have the ability to control both Halogen and LED type fixtures to ensure that future upgrades on the AGL from halogen to LED will not impact on the substation hardware or require new transformers.					
TOTAL CARRIED FORWARD TO SUMMARY						

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**SCHEDULE C: NEW TIE-IN QUEBEC
SECTION TWO: ILLUMINATED SIGNAGE (NIGHT WORKS)**

ITEM	DESCRIPTION	UNIT	LI	QUANTITY	RATE	AMOUNT
SECTION TWO	Note: Item Number Reference to be read in Conjunction with detail Electrical Specification in Part C3.2 of Volume 3. ILLUMINATED SIGNAGE (NIGHT WORKS)					
4.9.1	Supply and install illuminated LED signs for stands complete with concrete base/plinth and steel pole structure	No		9		
4.9.2	a) 700 x 2100mm	No		2		
4.9.3	b) 700 x 2500mm	No		3		
4.9.4	c) 900 x 2100mm	No		2		
4.9.5	d) 900 x 3000mm	No		2		
TOTAL CARRIED FORWARD TO SUMMARY						

TENDER NO: KSIA7806/2025/RFP - PROCUREMENT OF A CIDB GRADE 9 CE CONTRACTOR FOR THE COMPLETION OF BRAVO TAXIWAY EXTENSION AT KING SHAKA INTERNATIONAL AIRPORT FOR A PERIOD OF 12 MONTHS AT KING SHAKA INTERNATIONAL AIRPORT

**SCHEDULE C: NEW TIE-IN QUEBEC
SECTION THREE: AIRFIELD CABLE (NIGHT WORKS)**

ITEM	DESCRIPTION	UNIT	LI	QUANTITY	RATE	AMOUNT
SECTION THREE	Note: Item Number Reference to be read in Conjunction with detail Electrical Specification in Part C3.2 of Volume 3. AIRFIELD CABLE (NIGHT WORKS)					
4.12	Supply and install of PVC, PVC, SWA, PVC low voltage cable with copper conductors:					
4.12.1	Supply and install 4mm ² rubber/neoprene secondary airfield cable:	m		1 250		
4.12.2	Supply and install 6 mm ² Tinned Stranded CU conductor, XLPE, CU taped screened, HDPE, 2800/5000 Volts, series primary airfield cable (Various Colours)	m		8 760		
TOTAL CARRIED FORWARD TO SUMMARY						

TENDER NO: KSIA7806/2025/RFP - PROCUREMENT OF A CIDB GRADE 9 CE CONTRACTOR FOR THE COMPLETION OF BRAVO TAXIWAY EXTENSION AT KING SHAKA INTERNATIONAL AIRPORT FOR A PERIOD OF 12 MONTHS AT KING SHAKA INTERNATIONAL AIRPORT

**SCHEDULE C: NEW TIE-IN QUEBEC
SECTION FOUR: EARTHING (NIGHT WORKS)**

ITEM	DESCRIPTION	UNIT	LI	QUANTITY	RATE	AMOUNT
SECTION FOUR	Note: Item Number Reference to be read in Conjunction with detail Electrical Specification in Part C3.2 of Volume 3. EARTHING (NIGHT WORKS)					
4.19.1	Provide an instrument earthing system for the CCR 's	Sum		1		
4.19.2	Carry out Earth resistivity testing through the site prior to commencement of installation	Sum		1		
4.19.3	Supply and install 1 200mm earth rods:	No		10		
4.19.4	Supply and install (earth counterpoise) continuity conductor: 16mm ² BCEW	m		1 760		
4.19.5	Terminate and connect earth continuity conductor to earth rods complete with lugs:	No		49		
TOTAL CARRIED FORWARD TO SUMMARY						

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**SCHEDULE C: NEW TIE-IN QUEBEC
SECTION FIVE: GENERAL (NIGHT WORKS)**

ITEM	DESCRIPTION	UNIT	LI	QUANTITY	RATE	AMOUNT
SECTION FIVE	Note: Item Number Reference to be read in Conjunction with detail Electrical Specification in Part C3.2 of Volume 3. GENERAL (NIGHT WORKS)					
11	Cable Trays, Ladders, Racks and Associated Fixing Materials					
11.1	(i) Cable Racking for manholes					
11.1.1	Supply and Install Galvanised, 300mm Heavy Duty Cable Tray Including Support Brackets, Bends, T-pieces and Accessories. Price Shall Include for Joints, M8 Galvanized Treaded Rod, Nutsm Locknuts, Washer, Long Wedge Anchors, Drilling into Concrete and Other Materials Required to Complete the Installation. (300mm x 75mm)	m		9		
TOTAL CARRIED FORWARD TO SUMMARY						

**TENDER NO: KSIA7806/2025/RFP - PROCUREMENT OF A CIDB GRADE 9 CE CONTRACTOR THE
COMPLETION OF BRAVO TAXIWAY EXTENSION AT KING SHAKA INTERNATIONAL AIRPORT FOR A
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PART B: TENDER NO. KSIA7806/2025/RFP – ELECTRICAL ENGINEERING
SCHEDULE C: NEW TIE-IN QUEBEC
SUMMARY OF SECTIONS

CHAPTER	DESCRIPTION	FROM PAGE	AMOUNT
SECTION 1	AIRFIELD GROUND LIGHTING SYSTEM	C2-88	R
SECTION 2	ILLUMINATED SIGNAGE	C2-89	R
SECTION 3	AIRFIELD CABLE	C2-90	R
SECTION 4	EARTHING	C2-91	R
SECTION 5	GENERAL	C2-92	R
TOTAL CARRIED FORWARD TO TENDER SUMMARY			R

**TENDER NO: KSIA7806/2025/RFP - PROCUREMENT OF A CIDB GRADE 9 CE CONTRACTOR THE
COMPLETION OF BRAVO TAXIWAY EXTENSION AT KING SHAKA INTERNATIONAL AIRPORT FOR A
PERIOD OF 12 MONTHS**

**PART B: TENDER NO. KSIA7806/2025/RFP – ELECTRICAL ENGINEERING
FINAL SUMMARY OF SECTIONS**

SCHEDULE	DESCRIPTION	FROM PAGE	AMOUNT
SCHEDULE A	PRELIMINARY AND GENERAL	C2-72	
SCHEDULE B	BRAVO TAXIWAY	C2-86	
SCHEDULE C	NEW TIE-IN QUEBEC	C2-93	
TOTAL CARRIED FORWARD TO FINAL TENDER SUMMARY			R

TENDER NO: KSIA7806/2025/RFP - PROCUREMENT OF A CIDB GRADE 9 CE CONTRACTOR THE COMPLETION OF BRAVO TAXIWAY EXTENSION AT KING SHAKA INTERNATIONAL AIRPORT FOR A PERIOD OF 12 MONTHS

SCHEDULE A: PRELIMINARY AND GENERAL

ITEM	DESCRIPTION	UNIT	LI	QUANTITY	RATE	AMOUNT
P&G	PRELIMINARY AND GENERAL					
1	FIXED CHARGE ITEMS	Lump Sum		1		
2	TIME RELATED ITEMS	Month		12		
3	SAFETY					
	Provision of Fire watchers for duration of project as required	Month		12		
	Provision of Gas Testers and Manhole watch as required	Month		12		
	Specialist Construction Permits (Hot works, Confined Spaces, Cranage, etc.)	Lump Sum		1		
TOTAL CARRIED FORWARD TO SUMMARY						

**TENDER NO: KSIA7806/2025/RFP - PROCUREMENT OF A CIDB GRADE 9 CE CONTRACTOR THE
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PERIOD OF 12 MONTHS**

**PART C: TENDER NO. KSIA7806/2025/RFP – MECHANICAL ENGINEERING
SCHEDULE A: PRELIMINARY AND GENERAL
SUMMARY OF SECTIONS**

CHAPTER	DESCRIPTION	FROM PAGE	AMOUNT
P&G	PRELIMINARY AND GENERAL	C2-96	
TOTAL CARRIED FORWARD TO TENDER SUMMARY			R

TENDER NO: KSIA7806/2025/RFP - PROCUREMENT OF A CIDB GRADE 9 CE CONTRACTOR THE COMPLETION OF BRAVO TAXIWAY EXTENSION AT KING SHAKA INTERNATIONAL AIRPORT FOR A PERIOD OF 12 MONTHS

SCHEDULE B: SUPPLY, INSTALLATION, AND TESTING OF PIPEWORK AND ANCILLARIES

ITEM	DESCRIPTION	UNIT	LI	QUANTITY	RATE	AMOUNT
PSS1	SUPPLY, INSTALLATION, AND TESTING OF PIPEWORK AND ANCILLARIES Rate to include procurement, delivery, stockpiling, handling, and transportation					
PSS 1.11.3	Pipe and Bends					
(i)	Pipe to be supplied in 6m lengths Piping 16" API 5L Grade B Pipe, 9.5mm Wall Thickness	m		802		
(ii)	External Denso Wrapping 16"	m		802		
(iii)	Internal Coating 16"	m		802		
(iv)	90 Degree Elbows 16" Long Radius Sched 40, ASTM A234 Gr WPB	No.		6		
(v)	45 Degree Elbows 16" Long Radius Sched 40, ASTM A234 Gr WPB	No.		4		
(vi)	Welding Works to be carried out during normal working hours. Weld the following diameter pipe, inclusive of cutting and preparation of the ends, and all consumables 16" API 5L Grade B Pipe, 9.5mm Wall Thickness	No.	LI	134		
(vii)	Welding (Night Works) Weld the following diameter pipe, inclusive of cutting and preparation of the ends, and all consumables All of the works covered in this section are to be carried out as night works (22:00 to 04:00) Rate to include lighting costs, power supply/generators etc. 16" API 5L Grade B Pipe, 9.5mm Wall Thickness	No.	LI	110		
TOTAL CARRIED FORWARD						

TENDER NO: KSIA7806/2025/RFP - PROCUREMENT OF A CIDB GRADE 9 CE CONTRACTOR THE COMPLETION OF BRAVO TAXIWAY EXTENSION AT KING SHAKA INTERNATIONAL AIRPORT FOR A PERIOD OF 12 MONTHS

SCHEDULE B: SUPPLY, INSTALLATION, AND TESTING OF PIPEWORK AND ANCILLARIES

ITEM	DESCRIPTION	UNIT	LI	QUANTITY	RATE	AMOUNT
	TOTAL BROUGHT FORWARD					
(viii)	Tie-in Works (Night Works) All of the works covered in this section are to be carried out as night works (22:00 to 04:00) Rate to include lighting costs, power supply/generators etc. Provide labour, tools, and equipment to complete the following tie-in works.					
(a)	Tie-in Point 1 Rate to include cold-cutting of existing pipe, lowering of new 16" pipe, welding, etc.	Lump Sum	LI	1		
(b)	Tie-in Point 1 Rate to include cold-cutting of existing pipe, lowering of new 16" pipe, welding, etc.	Lump Sum	LI	1		
PSS 1.11.4	Pressure Testing, Cleaning, and Drying of New Line Pipe (Night Works) All of the works covered in this section are to be carried out as night works (22:00 to 04:00) Rate to include lighting costs, power supply/generators etc. Provide labour, tools, and equipment to complete the following tie-in works. Refer PSS 1.7 Fig 1					
(i)	Section 1	Lump Sum	LI	1		
(ii)	Section 2	Lump Sum	LI	1		
PSS 1.11.5	Commissioning Works Provide labour, tools, and equipment to complete the following works.					
(i)	Nitrogen purging of new pipelines (Night Works, Ø16", 220m) Work to be carried out as night works. Rate to include lighting costs, power supply/generators etc.	Lump Sum		1		
(ii)	Nitrogen purging of new pipelines (Normal Hours, Ø16", 582m)	Lump Sum		1		
(iii)	Appointment of AIA, as nominated by Employer	Prov Sum		1		
	Mark-Up in respect of above Item, capped at 7.5%	%		2 800 000	1	2 800 000
(iv)	Provide assistance with filling and flushing of new pipelines	Lump Sum	LI	1		
TOTAL CARRIED FORWARD						

TENDER NO: KSIA7806/2025/RFP - PROCUREMENT OF A CIDB GRADE 9 CE CONTRACTOR THE COMPLETION OF BRAVO TAXIWAY EXTENSION AT KING SHAKA INTERNATIONAL AIRPORT FOR A PERIOD OF 12 MONTHS

SCHEDULE B: SUPPLY, INSTALLATION, AND TESTING OF PIPEWORK AND ANCILLARIES

ITEM	DESCRIPTION	UNIT	LI	QUANTITY	RATE	AMOUNT
	TOTAL BROUGHT FORWARD					
(v)	Provide assistance with soak testing of new pipelines : VC6 to VC13, VC13 to VC7, VC13 to LP11 (802m)	Lump Sum	LI	1		
(vi)	Pigging of new 16" pipeline (Nightworks, 220m) Work to be carried out as night works. Rate to include pig launcher, foam pig, etc.	Lump Sum	LI	1		
(vii)	Pigging of new 16" pipeline (Normal Hours, 582m) Rate to include pig launcher, foam pig, etc.	Lump Sum	LI	1		
TOTAL CARRIED FORWARD TO SUMMARY						

**TENDER NO: KSIA7806/2025/RFP - PROCUREMENT OF A CIDB GRADE 9 CE CONTRACTOR THE
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PERIOD OF 12 MONTHS**

**PART C: TENDER NO. KSIA7806/2025/RFP – MECHANICAL ENGINEERING
SCHEDULE B: SUPPLY, INSTALLATION, AND TESTING OF PIPEWORK AND ANCILLARIES
SUMMARY OF SECTIONS**

CHAPTER	DESCRIPTION	FROM PAGE	AMOUNT
PSS1	SUPPLY, INSTALLATION, AND TESTING OF PIPEWORK AND ANCILLARIES	C2-100	
TOTAL CARRIED FORWARD TO TENDER SUMMARY			R

TENDER NO: KSIA7806/2025/RFP - PROCUREMENT OF A CIDB GRADE 9 CE CONTRACTOR THE COMPLETION OF BRAVO TAXIWAY EXTENSION AT KING SHAKA INTERNATIONAL AIRPORT FOR A PERIOD OF 12 MONTHS

SCHEDULE C: SUPPLY, FABRICATION, INSTALLATION, AND TESTING OF VALVES AND ANCILLARIES

ITEM	DESCRIPTION	UNIT	LI	QUANTITY	RATE	AMOUNT
PSS2	SUPPLY, FABRICATION, INSTALLATION, AND TESTING OF VALVES AND ANCILLARIES					
PSS 2.10.1	Isolation Valves and Associated Installations					
(i)	16" 150# Expanded Plug, Reduced Bore, Double Block and Bleed Type, including actuator	No.		3		
(ii)	1/2" Ball Valve : Fire Safe	No.		2		
(iii)	1-1/2" Ball Valve : Fire Safe	No.		4		
(iv)	1-1/2 " Ball Valve : Stainless Steel	No.		3		
(v)	3" Ball valve : Fire Safe	No.		1		
PSS 2.10.1	Valve Manhole Covers, Ladders and Hydrant Pit Boxes					
(i)	Isolation Valve Cover, including ladders (Dabico) Cost (Seafreight Delivery)	No.		1		
	extra over above for Airfreight	No.		1		
	extra over above for Contractor forward cover to fix exchange rate	No.		1		
(ii)	Low Point Valve Box Cover (Norinco) Cost (Seafreight Delivery)	No.		2		
	extra over above for Airfreight	No.		2		
	extra over above for Contractor forward cover to fix exchange rate	No.		2		
(iii)	High Point Valve Box Cover (Norinco) Cost (Seafreight Delivery)	No.		1		
	extra over above for Airfreight	No.		1		
	extra over above for Contractor forward cover to fix exchange rate	No.		1		
(iv)	Hydrant Valve Box (including valve, Lay Flat Type : JIG Operations Bulletin 90) Cost (Seafreight Delivery)	No.		8		
	extra over above for Airfreight	No.		8		
	extra over above for Contractor forward cover to fix exchange rate	No.		8		
PSS 2.10.1	Associated Piping					
(i)	1/2" Sched.STD Stainless Steel	m		12		
(ii)	1 1/2" Sched.STD Stainless Steel	m		18		
(iii)	6" Sched.STD C/S	m		60		
PSS 2.10.1	Tee-Pieces					
(i)	Reducing Tee 16" x 6" Sched.40	No.		8		
(ii)	Equal Tee 16" Sched.40	No.		5		
TOTAL CARRIED FORWARD						

TENDER NO: KSIA7806/2025/RFP - PROCUREMENT OF A CIDB GRADE 9 CE CONTRACTOR THE COMPLETION OF BRAVO TAXIWAY EXTENSION AT KING SHAKA INTERNATIONAL AIRPORT FOR A PERIOD OF 12 MONTHS

SCHEDULE C: SUPPLY, FABRICATION, INSTALLATION, AND TESTING OF VALVES AND ANCILLARIES

ITEM	DESCRIPTION	UNIT	LI	QUANTITY	RATE	AMOUNT
	TOTAL BROUGHT FORWARD					
PSS 2.10.1	Reducers					
(i)	Concentric 1"x1/2" Sched.40 Stainless Steel	No.		1		
(ii)	Concentric 6" x 4" Sched.40	No.		8		
(iii)	Concentric 10"x6" Sched.40	No.		2		
(iv)	Concentric 16" x 10" Sched.40	No.		2		
PSS 2.10.1	Flanges					
(i)	Blank Flange 1/2" - 150# WNRF, Stainless Steel	No.		3		
(ii)	Slip On Flange 1/2" 150# RF	No.		6		
(iii)	Flange 1 1/2" - 150# WNRF	No.		2		
(iv)	Flange 1 1/2" - 150# WNRF Long Neck	No.		10		
(v)	Flange 1 1/2" - 150# WNRF Stainless Steel	No.		3		
(vi)	Blank Flange 1+1/2" - 150# RF	No.		6		
(vii)	Slip On Flange 1+1/2" - 150#	No.		4		
(viii)	Slip On Flange 4" - 150# Flat Face	No.		8		
(ix)	Flange 6" - 150# WNRF	No.		3		
(x)	Flange 6" - 300# WNRF	No.		8		
(xi)	Blank Flange S/S 6" - 150# RF	No.		2		
(xii)	Slip On Flange 6" - 300# WNRF	No.		8		
(xiii)	Flange 16" - 150# WNRF	No.		13		
(xiv)	Blank Flange 16" - 150# RF	No.		1		
(xv)	Flange 3" - 150# WNRF	No.		1		
(xvi)	Blank Flange 3" - 150# RF	No.		1		
PSS 2.10.1	Elbows					
(i)	Elbow 1+1/2" - 45 degree BW Sched.40	No.		4		
(ii)	Elbow 16" - 90 degree BW Sched.40	No.		6		
(iii)	Elbow 16" - 22.5 degree BW Sched.40	No.		4		
PSS 2.10.1	End Caps					
(i)	16" Sched.40	No.		2		
PSS 2.10.1	Spacers					
(i)	16" - 25 mm Sched.40	No.		3		
TOTAL CARRIED FORWARD						

TENDER NO: KSIA7806/2025/RFP - PROCUREMENT OF A CIDB GRADE 9 CE CONTRACTOR THE COMPLETION OF BRAVO TAXIWAY EXTENSION AT KING SHAKA INTERNATIONAL AIRPORT FOR A PERIOD OF 12 MONTHS

SCHEDULE C: SUPPLY, FABRICATION, INSTALLATION, AND TESTING OF VALVES AND ANCILLARIES

ITEM	DESCRIPTION	UNIT	LI	QUANTITY	RATE	AMOUNT
	TOTAL BROUGHT FORWARD					
PSS 2.10.1	Weldolets					
(i)	1+1/2" Weldolets - 150# Sched.40	No.		6		
(ii)	6" Weldolet - 150# Sched.40	No.		1		
(iii)	3" Weldolet - 150# Sched.40	No.		1		
PSS 2.10.1	Nipple					
(i)	1" Nipple S/S	No.		1		
PSS 2.10.1	Camlock and Dustcap					
(i)	25 mm Camlock and Dustcap	No.		5		
PSS 2.10.1	Gasket					
(i)	1/2" Spiral Wound Gaskets	No.		6		
(ii)	1-1/2" Spiral Wound Gasket	No.		15		
(iii)	3" Spiral Wound Gasket	No.		1		
(iv)	3" Spiral Wound Gasket	No.		1		
(v)	4" Klinger Topchem 2000 Gaskets	No.		8		
(vi)	6" Spiral Wound Gasket	No.		9		
(vii)	16" Klingersil C4430 Gaskets	No.		10		
PSS 2.10.1	Studs					
(i)	1/2" UNC Stud 60mm long Stainless Steel	No.		24		
(ii)	1/2" UNC Stud 75mm long	No.		30		
(iii)	1/2" UNC Stud 75mm long Stainless Steel	No.		4		
(iv)	1/2" UNC Stud 85mm long Stainless Steel	No.		24		
(v)	5/8" UNC Stud 90mm long	No.		32		
(vi)	5/8" UNC Stud 100mm long	No.		16		
(vii)	3/4" UNC Stud 110mm long Stainless Steel	No.		72		
(viii)	7/8" UNC Stepped Stud 110 mm long	No.		32		
(ix)	7/8" UNC Stepped Stud 140mm long	No.		32		
(x)	7/8" UNC Stud 155mm long Galvanized	No.		56		
(xi)	7/8" UNC Stud 175mm long	No.		32		
(xii)	7/8" UNC Stud 180mm long	No.		32		
TOTAL CARRIED FORWARD						

TENDER NO: KSIA7806/2025/RFP - PROCUREMENT OF A CIDB GRADE 9 CE CONTRACTOR THE COMPLETION OF BRAVO TAXIWAY EXTENSION AT KING SHAKA INTERNATIONAL AIRPORT FOR A PERIOD OF 12 MONTHS

SCHEDULE C: SUPPLY, FABRICATION, INSTALLATION, AND TESTING OF VALVES AND ANCILLARIES

ITEM	DESCRIPTION	UNIT	LI	QUANTITY	RATE	AMOUNT
	TOTAL BROUGHT FORWARD					
PSS 2.10.1	Nuts					
(i)	1/2" 2H =Nuts	No.		72		
(ii)	1/2" 2H Nuts S/S	No.		104		
(iii)	5/8" 2H Nuts	No.		32		
(iv)	3/4" 2H Nuts S/S	No.		144		
(v)	7/8" 2H Nuts	No.		144		
(vi)	7/8" 2H Nuts Galvanized	No.		112		
PSS 2.10.1	Washers					
(i)	Washers for 1/2"	No.		36		
(ii)	Washers 1/2" Stainless Steel	No.		104		
(iii)	Washers 5/8"	No.		32		
(iv)	Washers 3/4" Stainless Steel	No.		144		
(v)	Washers 7/8"	No.		144		
(vi)	insulating Washers 7/8"	No.		144		
(vi)	Washers 7/8" Galvanized	No.		112		
PSS 2.10.2	Fabrication, Testing and Installation of Valve Assemblies (Night Works) All of the works covered in this section are to be carried out as night works (22:00 to 04:00) Rate to include lighting costs, power supply/generators etc. Provide labour, tools, and equipment for fabrication, testing, and installation of the following items					
(i)	Isolation Valve Assembly VC13 (Night Works)	Lump Sum	LI	1		
(ii)	New Low Point 7 (Night Works)	Lump Sum	LI	1		
(iii)	New High Point 6 (Night Works)	Lump Sum	LI	1		
PSS 2.10.3	Fabrication, Testing and Installation of Valve Assemblies (Normal Hours) All of the works in this section are to be carried out during normal working hours. Provide labour, tools, and equipment for fabrication, testing, and installation of the following items					
(i)	New Low Point 11	Lump Sum	LI	1		
(ii)	Hydrant Valve Assemblies	No.		8		
PSS 2.10.3	Cathodic Protection Installation (Night Works)					
(i)	Reference Electrodes and Cabling at VC13	No.		1		
(ii)	Cross-bonds and cabling	No.		3		
(iii)	Spark Gaps	No.		12		
	TOTAL CARRIED FORWARD TO SUMMARY					

TENDER NO: KSIA7806/2025/RFP - PROCUREMENT OF A CIDB GRADE 9 CE CONTRACTOR THE COMPLETION OF BRAVO TAXIWAY EXTENSION AT KING SHAKA INTERNATIONAL AIRPORT FOR A PERIOD OF 12 MONTHS

PART C: TENDER NO. KSIA7806/2025/RFP – MECHANICAL ENGINEERING
SCHEDULE C: SUPPLY, FABRICATION, INSTALLATION, AND TESTING OF VALVES AND ANCILLARIES
SUMMARY OF SECTIONS

CHAPTER	DESCRIPTION	FROM PAGE	AMOUNT
PSS2	SUPPLY, FABRICATION, INSTALLATION, AND TESTING OF VALVES AND ANCILLARIES	C2-105	
TOTAL CARRIED FORWARD TO TENDER SUMMARY			R

**TENDER NO: KSIA7806/2025/RFP - PROCUREMENT OF A CIDB GRADE 9 CE CONTRACTOR THE
COMPLETION OF BRAVO TAXIWAY EXTENSION AT KING SHAKA INTERNATIONAL AIRPORT FOR A
PERIOD OF 12 MONTHS**

**PART C: TENDER NO. KSIA7806/2025/RFP – MECHANICAL ENGINEERING
FINAL SUMMARY OF SECTIONS**

SCHEDULE	DESCRIPTION	FROM PAGE	AMOUNT
SCHEDULE A	PRELIMINARY AND GENERAL	C2-97	
SCHEDULE B	SUPPLY, INSTALLATION, AND TESTING OF PIPEWORK AND ANCILLARIES	C2-101	
SCHEDULE C	SUPPLY, FABRICATION, INSTALLATION, AND TESTING OF VALVES AND ANCILLARIES	C2-106	
TOTAL CARRIED FORWARD TO FINAL TENDER SUMMARY			R

C2.2.2 Summary Of Final Schedule Of Quantities



AIRPORTS COMPANY SOUTH AFRICA

AIRPORTS COMPANY SOUTH AFRICA

KING SHAKA INTERNATIONAL AIRPORT

TENDER NO: KSIA7806/2025/RFP

PROCUREMENT OF A CIDB GRADE 9 CE CONTRACTOR THE COMPLETION OF BRAVO TAXIWAY
EXTENSION AT KING SHAKA INTERNATIONAL AIRPORT FOR A PERIOD OF 12 MONTHS

SUMMARY OF FINAL SCHEDULE OF QUANTITIES

DESCRIPTION	AMOUNT
TOTALS OF BILL OF QUANTITIES BROUGHT FORWARD:	
C2.2.1 PART A: TENDER NO. KSIA7806/2025/RFP – CIVIL ENGINEERING B/F FROM PAGE C2-69	R
C2.2.2 PART B: TENDER NO. KSIA7806/2025/RFP – ELECTRICAL ENGINEERING B/F FROM PAGE C2-94	R
C2.2.3 PART C: TENDER NO. KSIA7806/2025/RFP – MECHANICAL ENGINEERING B/F FROM PAGE C2-107	R
SUBTOTAL 1	R
<u>Add:</u> CONTRACT SKILLS DEVELOPMENT GOALS – CSDG (0.25% of SUBTOTAL 1)	R
SUBTOTAL 2 = (SUBTOTAL 1 + CSDG)	R
Add: Contract Price Adjustment - CPA (10% of SUBTOTAL 2)	R
SUBTOTAL 3 = (SUBTOTAL 2 + CPA)	R
Add: Contingencies (10% of SUBTOTAL 3)	R
SUBTOTAL 4 = (SUBTOTAL 3 + CONTINGENCIES)	R
<u>Add:</u> VAT (15% of SUBTOTAL 4)	R
TOTAL CARRIED FORWARD TO FORM OF OFFER	R



AIRPORTS COMPANY SOUTH AFRICA

AIRPORTS COMPANY SOUTH AFRICA

KING SHAKA INTERNATIONAL AIRPORT

TENDER NO: KSIA7806/2025/RFP

PROCUREMENT OF A CIDB GRADE 9 CE CONTRACTOR THE COMPLETION OF BRAVO
TAXIWAY EXTENSION AT KING SHAKA INTERNATIONAL AIRPORT FOR A PERIOD OF 12
MONTHS

C3: SCOPE OF WORKS

C3.1 DESCRIPTION OF THE WORKS	C3-2
C3.2 ENGINEERING	C3-12
C3.3 PROCUREMENT	C3-14
C3.4 CONSTRUCTION	C3-15
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C3.6 PARTICULAR (PROJECT) SPECIFICATIONS:	C3-23
C3.7 ACSA SPECIFICATIONS	C3-179

C3.1: DESCRIPTION OF THE WORKS

C3.1.1 EMPLOYER'S OBJECTIVES

The Employer's objective is to Rehabilitate Bravo Taxiway, Construction of New Quebec Tie-in and Additional Apron Stands at King Shaka International to comply with the relevant recommended standards and practices In the International Civil Aviation Organization Annex 14 Ninth Edition.

One of the objectives of the project is to train any of the following (occupational qualifications, trade qualification, work integrated learners – P1 and P2 learners, professional candidates)

The Contractor shall provide opportunities to learners requiring structured workplace learning using one or a combination of any of the Skills Methods as agreed: accommodate Part/Full Occupational qualification (Method 1), Trade qualifications learners (Method 2), train Work Integrated Learners – P1 and P2 Learners (Method 3) and/or Professional Candidates (Method 4) as indicated in the CIDB Standard and as agreed to by the Employer on this project (Employer to stipulate)

C3.1.2 OVERVIEW OF THE WORKS

The work to be performed under this contract comprises mainly of the Rehabilitation Bravo Taxiway, Construction of New Quebec Tie-in and Additional Apron Stands at King Shaka International Airport.

The following aspects will be addressed in this project:

Civil Works - Bravo Taxiway, Quebec Tie-in and Apron Stands

- Taxiway Bravo and shoulder will be rehabilitated and re-surfaced. The detailed layerworks are as follows:

Taxiway	Shoulder
50mm Asphalt Wearing Course (Sa-E14 - AP1 Modified Binder (PG 64E-16) Level 3 Design) NMPS 14mm	Variable Asphalt Wearing Course Tapered From Taxiway - (Sa-E14 - AP1 Modified Binder (PG 64E-16) Level 3 Design) NMPS 14mm
70mm High Modulus Asphalt (Class II EME) (10-20 Penetration Grade Bitumen) NMPS 14mm	
Variable BTB Thicknesses From 150mm To 190mm (AE-2 Modified Binder & Level 3 Design) NMPS 14mm	

- Construction of the Quebec Tie-In. The detailed layerworks are as follows:

Taxiway	Shoulder
50mm Asphalt Wearing Course (Sa-E14 - AP1 Modified Binder (PG 64E-16) Level 3 Design) NMPS 14mm	50mm Asphalt Wearing Course (Sa-E14 - AP1 Modified Binder (PG 64E-16) Level 3 Design) NMPS 14mm

120mm High Modulus Asphalt (Class II EME) (10-20 Penetration Grade Bitumen) NMPS 14mm @ Min. 96% Of MVD (Constructed In 2 Lifts)	150mm G2 Compacted to 88% AD
400mm C3 (Min. G5A) @ 97% MDD - Constructed In 2 Layers Of 200mm Each	200mm C4 (Min G5A) Compacted to 97% MMD
300mm G7 - @ 95% MDD - Constructed In 2 Layers Of 150mm Each	250mm G7 Compacted to 95% MMD
150mm G9 - @ 93% MDD	150mm G9 Compacted to 93% MMD
750mm Dump Rock Wrapped In A4 Grade Bidum	Insitu Subgrade – 150mm Rip & Recompect to 90% MDD
Rock Grid-(200/200)	
Insitu Subgrade – 150mm Rip & Recompect To 90% MDD	

- Drainage improvements on the Bravo Taxiway and the Quebec Tie-In side grassed areas that may include level correction with construction of subsoil drainage and re-vegetation/hydro seeding, excess grass removal and improvements to drainage inlets.
- New line markings on Bravo Taxiway and New Quebec Tie-In.
- Removal and replacement of existing infrastructure, including replacement of any damaged equipment thereof.
- Civil works pertaining to excavations, trenching, backfill and new manholes and chambers for Mechanical and Electrical works on Bravo Taxiway, New Quebec Tie-In and Apron Stands.

Electrical Works - Bravo Taxiway, Quebec Tie-in and Apron Stands

The scope of works covers the supply, delivery, installing, testing and commissioning of the following material and equipment for the upgrading of the Foxtrot apron stands, Bravo taxiway extension and Quebec link, in terms of electrical airfield ground lighting (AGL) infrastructure and apron stand electrical inclusions at the King Shaka Airport:

- Runway edge lights for the main runway;
- Taxiway lighting for all the taxiways;
- Stop Bar lighting for the link
- Constant current regulators (CCR's) for the airfield lighting circuits;
- Airfield lighting cables and circuits;

- Upgrading of existing control and monitoring system and fibre optic control cables to include all changes;
- Apron floodlighting

The contractor shall furthermore be responsible for removing all existing light fittings and other equipment prior to commencing with construction works. All material and equipment shall be handed over to the designated maintenance personnel at the airport who shall sign receipt for the material and equipment. The contractor will be held responsible for any material not handed over to the maintenance personnel and which cannot be accounted for.

The main contractor will supply and install the cable ducts and manholes, cut slots into asphalt and repair these surfaces for installation of the airfield lighting cable circuits **if required**. The electrical contractor shall supply and where specified install all shallow bases for inset fittings, ducts for secondary cables and other material required to mount the light fittings supplied.

The civil contractor shall furthermore be responsible for undertaking all civil work required for the installation of airfield lighting, plinths, and core drilling for galvanised steel cans. The civil contractor shall only undertake excavations where specified or were instructed to in writing by the engineer. The contractor shall therefore ensure the sufficiency of his excavation rates.

Mechanical Works - Apron Stands

- Demolition of existing fuel pipelines and equipment.
- Appointment of AIA.
- Supply and installation of 16" steel fuel pipelines.
- Tie-in of new 16" steel fuel pipeline.
- Procurement, transportation and installation of valves, valve box covers, and associated piping and materials.
- Installation of cathodic protection.
- Coating of new pipelines and associated equipment.
- Provide assistance with bentonite-cement grouting, flushing, and soak testing of pipelines where required.
- Pressure testing, cleaning and drying of new pipelines.

Quantification Of Waste From Previous Contract

- The Contractor will be responsible for the quantification of any waste material removed from the previously incomplete Contract. The quantification shall be done on a monthly basis, and a detailed report shall be submitted to the Engineer, Client and Quantity Surveyor for the duration of the project. This shall be applicable to all scope of works being in construction, which include civil, electrical, and mechanical works. A qualified professional quantity surveyor (PrQS) shall compile the report and sign off on a monthly basis. The cost for the quantification and report shall be deemed included in the contractor's Preliminary and General Cost for each specific scope of work.

C3.1.3 EXTENT OF THE WORKS

The description of the work contained in the Extent of Work is merely an outline of the work to be executed in terms of the contract and shall not limit the work to be carried out by the Contractor. Estimated quantities of each type of work to be carried out are listed in the Bill of Quantities. The planned rehabilitation and construction measures are shown on the construction drawings.

The Works included in this contract will mainly consist of the works described in the sub-sections below:

(a) General

General work operations include:

- i) Compilation and submission for approval of a detailed site safety plan and work method statements, all in compliance with the Manual for Working Airside – Volume 5.
- ii) Attendance by all site staff of a safety training course and obtaining ACSA permits. This includes the necessary vehicle and equipment driving permits for any driver having to drive airside, as indicated in the Manual for Working Airside – Volume 5.
- iii) Compile and submit a quality management plan for approval by the Employer's Agent.
- iv) Compliance with local and national Occupational Health and Safety regulations (OHS Act No. 85 of 1993) and ACSA Health and Safety regulations.
- v) Full compliance with the ACSA Environmental Specifications.
- vi) Establishment on site of the camp, storage area for materials allocated for this project.
- vii) Locating, relocating (where required) and protection of all services in the work areas.
- viii) Undertaking of asphalt mix designs and trials to prove compliance with specifications.
- ix) Structured and detailed interaction with various role players at the airport to ensure timeous completion of the works for each shift. These role players include the staff of the Airport Management (AM) and the Air Traffic Control (ATC). Management of the project planning and operational procedures for working airside.
- x) Cleaning of the construction area after each work shift to the satisfaction of AM staff.

(b) Civil Works - Pavement Rehabilitation and New Construction

Work will have to be undertaken in phases taking the current traffic pattern into consideration and ensuring that the airport will still be operational during the construction period. Majority of the work will be executed during normal daylight hours. Night shift work will be required at the intersection of Bravo Taxiway with November Taxi Way and Alpha Taxi Way, New Quebec Tie-In and at the edges of the Foxtrot Apron Stand , their time periods will be as follows:

- Intersection of Bravo Taxiway with November Taxi Way and Alpha Taxi Way - From 22h00 to 04h00 – 7 days a week.
- New Quebec Tie-in - From 22h00 to 04h00 – 7 days a week.
- Foxtrot Apron Stand - From 22h00 to 04h00 – 7 days a week.

Specific reference is made to detailed drawing KSIA-CIV-PP-033 for Night Work areas.

The extent of the works can be summarised as follows:

Taxiway Bravo

As described in the overview of the work, the rehabilitation items will include:

Taxi Way

- 50mm Asphalt Wearing Course (Sa-E14 - AP1 Modified Binder (PG 64E-16) Level 3 Design) NMPS 14mm.
- 70mm High Modulus Asphalt (Class II EME) (10-20 Penetration Grade Bitumen)(Design as per SABITA Manual 33) NMPS 14mm.
- Variable BTB Thicknesses From 150mm to 190mm (AE-2 Modified Binder & Level 3 Design) NMPS 14mm.
- Re-shaping End Safety Areas to avoid any future standing water.
- Filling up cracks with specified crack sealant.
- Joint repair.
- Painted line markings.

Shoulders

- Variable Asphalt Wearing Course Tapered From Taxiway - (Sa-E14 - AP1 Modified Binder (PG 64E-16) Level 3 Design) NMPS 14mm
- Joint repair.
- Edge break repairs.
- Painted line markings.

Quebec Tie-in Area

Taxi Way

- Bulk Earthworks – Box Cut.
- Insitu Subgrade – 150mm rip & recompact to 90% MDD.
- Rock Grid-(200/200).
- 750mm Dump Rock wrapped in A4 grade Bidum.
- 150mm G9 - @ 93% MDD.
- 300mm G7 - @ 95% MDD - constructed in 2 layers of 150mm each.
- 400mm C3 (Min. G5A) @ 97% MDD - constructed in 2 layers of 200mm each.
- 120mm High Modulus Asphalt (Class II EME) (10-20 Penetration Grade Bitumen) NMPS 14mm @ Min. 96% of MVD (constructed in 2 lifts).
- 50mm Asphalt Wearing Course (Sa-E14 - AP1 Modified Binder (PG 64E-16) Level 3 Design) NMPS 14mm.
- Painted line markings.

Shoulders

- Bulk Earthwork – Box Cut
- Insitu Subgrade – 150mm Rip & Recompact to 90% MDD
- 150mm G9 Compacted to 93% MMD
- 250mm G7 Compacted to 95% MMD
- 200mm C4 (Min G5A) Compacted to 97% MMD
- 150mm G2 Compacted to 88% AD
- 50mm Asphalt Wearing Course (Sa-E14 - AP1 Modified Binder (PG 64E-16) Level 3 Design) NMPS 14mm

(c) Edge Protection And Drainage Improvements – Taxiway Bravo and New Quebec Tie-In

- Grading and shaping where necessary (particularly at intersections) to improve surface water flow and eradicate low points.
- Rehabilitation to grid inlets, including clearing of debris and silt build-up in manholes and open drains.
- New subsoil drains implemented at taxiway shoulders and Quebec new tie-in area.
- Additional stormwater grid inlets.

(d) Other ancillary Works

There are a number of ancillary works which would be required as part of this contract which can be summarised as follows:

- Regular friction and texture depth tests will be conducted on the completed surface to ensure that specifications are met in terms of International Civil Aviation Organization Annex 14 Ninth Edition.
- Where asphalt overlay has been applied, the new level will be re-profiled to ensure International Civil Aviation Organization compliances, as per supplied Longitudinal and Cross-section drawings.
- Application of permanent and temporary taxiway markings consisting of respectively reflective white and yellow markings using water-based paint complying with International Civil Aviation Organization recommendations.
- Control dust and other pollution according to the safety plan and work method statements.

(e) Electrical Works

The electrical drawings and specification should be read in conjunction with the extent of works below:

Runway Edge lighting

The Quebec link from Alpha Taxiway will intersect into the existing runway, as a result the existing elevated runway edge luminaires (elevated omni-directional white LED) will be removed and replaced with inset runway edge luminaires (inset bi-directional white LED).

Taxiway Lighting for all taxiways

New low intensity blue lights shall be installed on the taxiway edge. The taxiway lights shall be installed on the tarred shoulder of the taxiway. The lights shall be omni-directional, elevated lights. The lamp shall be of the LED type. These lights will be connected via 4mm² secondary cable to a series transformer located in the allocated manhole as per KSIA-ELEC-TX-001.

Installation of lighting on the Quebec link (linking Alpha Taxiway to the Runway) will occur at night, and the contractor is to ensure adequate allowances are made for night works. (refer to drawing KSIA-ELEC-TX-001)

All existing light fittings and other electrical equipment to be removed will be the responsibility of the contractor. Refer to the electrical specification and the electrical drawing pack to assist in identifying the items to be removed prior to the commencement of construction works. All removed items are to be returned to the designated maintenance personnel.

Constant Current Regulators (CCRs) for stop bar, guard and lead-on lights

CCRs are required to be installed in the existing substation on site, these 7 CCRs will be installed in the same substations and they will each be supplying stop bar lights, lead-on lights and guard light circuits which are to be installed as per the electrical specification approximately 1.4km from the substation via the 6mm² primary cable. These installations will also form part of night works.

Control and Monitoring Systems

The CCRs will all be controlled and managed via the KSIA control tower. The substation houses an existing communication hub with the control tower and therefore all new CCRs should be programmed through such. The programming of the PLC and graphics incorporation should be completed by a specialist. Down-time regarding controls should be avoided if possible.

Electrical works on the Apron

The apron has 3 x 30m high mast lights of which 1 mast (Mast 3 next to MS2 – Refer to KSIA-OV-EW-00) needs to be adjusted as it is currently sitting in the flight path of the runway. A specialist will be required to design and reduce the height of the mast to meet ICAO standards and KSIA requirements.

All electrical cabling and installations on the Apron needs to be completed i.e. Feeds from the mini-sub to the high-mast lights, signage, obstruction lights and generators.

There are 2 x 500kVA diesel generators on site which need to be tested, have new batteries installed and commissioned by a specialist. Kindly refer to the electrical specification for more detail.

Signage

All signage as detailed in KSIA-ELEC-TX-001 shall be supplied, installed, tested and commissioned including the lamps for all the required sections, the earth tags, the mounting flanges with securing sundries, and all other material required to install the signage. Kindly refer to the Electrical Specification Document for more details.

(f) Mechanical Works – Apron Stands

- Demolition of partially constructed fuel pipelines and equipment – to be completed as night work (Refer to general arrangement drawing KSIA-MECH-GA-001 for Night Work areas):
 - LP7
 - HP 6
 - Partially Constructed HP6
 - VC13
- Demolition of existing and partially constructed fuel pipelines and equipment during normal working hours:
 - LP11
 - All Pit Valves
- Appointment of AIA, as nominated by Employer.
- Procurement, transportation, stringing, welding, weld-joint coating, laying, and all ancillary works for the installation of new 16" steel main fuel pipeline between indicated tie-in points – to be completed as night work (Refer to general arrangement drawing KSIA-MECH-GA-002 for Night Work areas). Procurement, transportation, stringing, welding, weld-joint coating, laying, and all ancillary works for the installation of 16" steel fuel hydrant pipeline.
- Isolation, draining, and purging of existing fuel pipeline between VC6 and VC7 – to be completed as night work (Refer to general arrangement drawing KSIA-MECH-GA-001 for Night Work areas).
- Cold cutting of existing fuel supply pipeline at specified locations and tie-in of new 16" main fuel pipeline segment – to be completed as night work (Refer to general arrangement drawing KSIA-MECH-GA-001 for Night Work areas).
- Procurement, transportation, fabrication, testing, and installation of valve assemblies, valve box covers, and associated piping and materials at new Foxtrot apron, including (but not limited to) the following:
 - 16" Isolation Valves at VC13 – installation to be completed as night work (Refer to general arrangement drawing KSIA-MECH-GA-002 for Night Work areas). 6" ball valves at Hydrant Points.
 - Hydrant valve boxes.
 - New Low Point Station LP7 – installation to be completed as night work (Refer to general arrangement drawing KSIA-MECH-GA-002 for Night Work areas). New Low Point Station – LP11
 - New High Point Station HP6 – installation to be completed as night work (Refer to general arrangement drawing KSIA-MECH-GA-002 for Night Work areas). Installation of cathodic protection.
- Coating of new pipelines and associated equipment on hydrant supply line:
 - Coating of exposed piping and equipment at valve stations.
 - External coating of line pipe.
 - Internal coating of line pipe, bends, and hydrant risers.
- Coating of new pipelines and associated equipment on main fuel line – to be completed as night work (Refer to general arrangement drawing KSIA-MECH-GA-002 for Night Work areas).

- External coating of line pipe.
- Internal coating of line pipe, bends, and hydrant risers.
- Cold cutting of existing main fuel supply pipeline between VC6 and VC7 to assist with bentonite-cement grouting – to be completed as night work (Refer to general arrangement drawing KSIA-MECH-GA-002 for Night Work areas).
- Assistance with flushing and soak testing of 16" new pipelines, where required – to be completed as night work (Refer to general arrangement drawing KSIA-MECH-GA-002 for Night Work areas).
- Pressure testing of new 16" fuel hydrant pipeline.
- Pressure testing of new 16" main fuel supply line – to be completed as night work. (Refer to general arrangement drawing KSIA-MECH-GA-002 for Night Work areas).
- Pigging of new 16" pipelines – to be completed as night work (Refer to general arrangement drawing KSIA-MECH-GA-002 for Night Work areas).
- Nitrogen purging of new 16" fuel pipelines.

(g) Changes to Scope of Work

It is a condition of this contract that the employer reserves the right to limit the total expenditure on the Works due to possible budget constraints. Should the tender sum exceed the budgeted amount, the scope of the works may be reduced at any time before or during the contract period to ensure that the final contract amount does not exceed the budgeted amount.

(h) Quantification Of Waste From Previous Contract

The Contractor will be responsible for the quantification of any waste material removed from the previously incomplete Contract. The quantification shall be done on a monthly basis, and a detailed report shall be submitted to the Engineer, Client and Quantity Surveyor for the duration of the project. This shall be applicable to all scope of works being in construction, which include civil, electrical, and mechanical works. A qualified professional quantity surveyor (PrQS) shall compile the report and sign off on a monthly basis. The cost for the quantification and report shall be deemed included in the contractor's Preliminary and General Cost for each specific scope of work.

C3.1.4 LOCATION OF THE WORKS

The site of the Works is situated on the airside of King Shaka International Airport in KwaZulu-Natal. The site is under the jurisdiction of the Airports Company South Africa (ACSA). Location of the site is shown on the Layout Plan (Drawing No. KSIA-CIV-LA-003). The contractor's site camp will be situated within ACSA's premises and shall be indicated at the site clarification meeting.

C3.1.5 TEMPORARY WORKS

The Contractor shall obtain written permission from the Employer's Agent before construction of any temporary works may commence. Temporary works will include the following:

- (a) Where applicable (in limited occupation areas), transverse and longitudinal ramps at the end of each shift during construction of the asphalt overlays on the taxiways. The details for the construction and removal of these ramps are discussed in the project specification.
- (b) Signage and markings for the surface movement of aircraft and vehicles.
- (c) Placing and removal of barricades where required.

- (d) All facilities within the Contractor's construction camp. The design shall comply with the specifications, where provided in these documents and all statutory requirements such as the Occupational Health and Safety Act and Regulations. The area is to be reinstated upon completion.
- (e) Access roads for the construction camp and temporary material stockpile site. These roads are to be designed, constructed and maintained by the Contractor to comply with safety and environmental requirements. They must be reinstated upon completion of the Works.
- (f) Placing and removing of lighting equipment for night works.

C3.2: ENGINEERING

C3.2.1 DESIGN SERVICES AND ACTIVITY MATRIX

The responsibilities for design and related documentation are as follows:

DESCRIPTION	RESPONSIBILITY
Detailed design for construction	Employer's Agent's Representative
Temporary works (Section C3.1.5): Items a) to b) Items c) to f) and any other temporary works required by the contractor	Employer's Agent's Representative Contractor
As-built drawings: Provision of data and marked up drawings Preparation of drawings	Contractor Employer's Agent's representative

C3.2.2 EMPLOYER'S DESIGN

The extent of the Employer's design is shown on the construction drawings.

C3.2.3 CONTRACTOR'S DESIGN BRIEF

The design brief for Temporary Works is provided in Section C3.1.5.

C3.2.4 DRAWINGS

Drawings are not required for the Temporary Works and will be designed by the Contractor.

The reduced drawings that form part of the tender documents shall be used for tender purposes only. The Contractor will be issued with an A3 paper copy and PDF file of each of the drawings required for construction. The Contractor shall, at his own expense, produce all further prints required for the construction of the Works.

The Contractor shall not use the drawings for any purpose other than the execution of the works.

Only figured dimensions on the drawings shall be used, and drawings shall not be scaled. The Employer's Agent shall supply any figured dimensions which have been omitted from the drawings.

The Employer's Agent may issue additional drawings as necessary to the Contractor from time to time during the progress of the works. The Contractor shall timeously notify the Employer's Agent of the priority in which drawings and details are required.

Before a Certificate of Completion will be issued, all as-built data must be provided to the Employer's Agent on completion of the Permanent Works. The data must be provided in electronic form (as per the Employer's Agent's format) or where appropriate marked up on a set of drawings. Any information in the possession of the Contractor necessary for the Resident Engineer to complete his as-built drawings shall be supplied to the Resident Engineer on a regular basis and all information must be delivered before a Certificate of Completion will be issued.

The drawings, as listed in Volume 4, form part of the tender documents and shall be used for tender purposes only.

C3.2.5 DESIGN PROCEDURES

Civil Works

Asphalt mixes to be designed in co-ordination with an approved (by the Employer's Agent) specialist professional asphalt design engineer and laboratory and submitted to the Employer's Agent for approval. The design laboratory and specialist asphalt design engineer shall be paid under a Provisional Sum item provided in the Bill of Quantities.

Fundamental design principles and methods (see applicable SABITA, and other applicable institutions, manuals and guidelines) to be utilized to ensure optimal mixes in accordance with the specified performance criteria.

C3.2.6 CONSTRUCTION IN CONFINED AREAS

Working space for some of the work to be carried out under this contract is restricted. The construction method used in these confined areas largely depends on the Contractor's plant. However, the Contractor must note that measurement and payment will be according to the specified cross-sections and dimensions irrespective of the method used, and that the rates and prices tendered will be deemed to include full compensation for difficulties encountered while working in confined areas.

C3.3: PROCUREMENT

C3.3.1 PREFERENTIAL PROCUREMENT PROCEDURES

The Works shall be executed in accordance with the requirements specified in Section T1.2, Tender Data (Clause C3.11) and submitted by the Contractor in his Returnable Schedules.

C3.3.2 SUBCONTRACTING

(a) Scope of Mandatory Subcontract Works

The Mandatory Works to be subcontracted are the Electrical Works, Fuelling and Mechanical described in Clause C3.1.3(e & f).

(b) Preferred Subcontractors

The subcontractors must meet the requirements as laid out in Clause F3.11 of this document.

(c) Subcontracting Procedures

The electrical works as well as the fuel and mechanical works shall be subcontracted to CIDB registered contractors in accordance with the subcontracting procedures set out in the General Conditions of Contract.

(d) Attendance on Subcontractors

The Contractor shall provide any necessary facilities in order to manage the specialist electrical subcontractor to ensure that the works are carried out in accordance with:

- The programme of works, and
- The contract requirements, and
- In the Project requirements concerning access to and from the airport facilities at the beginning and end of working shifts. He shall also ensure that the subcontractor complies with the requirements of the Safety Plan, Environmental Management Plan and Operational procedure requirements.

C3.4: CONSTRUCTION

C3.4.1 WORKS SPECIFICATIONS

(e) Applicable Standard Specifications

The Standard General and Technical Specifications for Civil Works shall be the COTO - Standard Specifications for Road and Bridge Works or South African Road Authorities 2020.

The Standard Specifications forming part of this contract have been written to cover all phases of work usually encountered on road and bridge contracts and may therefore cover items of work not encountered in this Project contract.

The Contractor is responsible for ensuring that he is thoroughly familiar with all the amendments and corrections before submitting his tender.

(f) Applicable National and International Standards

The Works must comply with certain National and International Standards. These include:

- International Civil Aviation Organization Annex 14 Ninth Edition (ICAO)
- Standard Specifications for Road and Bridge Works or South African Road Authorities 2020 (COTO)
- South African National Standards (SANS)
- South African Bureau of Standards (SABS)
- American Petroleum Institute (API)
- American Society for Testing and Materials (ASTM)
- American Society of Mechanical Engineers (ASME)
- British and European Standard (BS/EN)
- Energy Institute (EI)
- Model Code of Safe Practice (IP MCoSP)
- National Association of Corrosion Engineers (NACE)
- National Fire Protection Association (NFPA)
- Federal Aviation Administration (FAA)

Where required, compliance with these and other National and International Standards have been specified in the Standard and Project Specifications.

(g) Project Specifications

In certain clauses, the Standard Specifications allow a choice to be specified in the Particular (Project) Specifications between alternative materials or methods of construction and for additional requirements to be specified to suit a Contract. Details of such alternatives or additional requirements applicable to this Contract are contained in the Particular (Project) Specifications (C3.6A: Particular (Project) Specifications: Civil, C3.6B: Particular (Project) Specifications: Mechanical and C3.6C: Particular (Project) Specifications: Electrical). It also contains some additional specifications required for this Contract.

(h) Certification by Recognized Bodies

Where required, South African Bureau of Standards (SABS) must undertake the certification of items for inclusion in the Works.

C3.4.2 PLANT AND MATERIALS

(a) Plant and Materials supplied by the Employer

Nil

(b) Materials, Samples and Shop Drawings

Where required, requirements for proof of compliance with materials specifications, submission of samples of materials and finishes and requirements for shop drawings, are stated in the standard or project specifications. This will also apply to the subcontracts.

All materials used in the works shall, where such mark has been awarded for a specific type of material, bear the official mark of the SANS (SABS). Written proof shall be obtained from the Employer's Agent for any materials not bearing the official mark of the SANS.

C3.4.3 CONSTRUCTION EQUIPMENT

(a) Requirements for Equipment

Where applicable, minimum requirements for equipment are specified in the Standard and Project specifications.

The Contractor shall indicate in his construction Method Statement how he will manage an emergency where a plant item breaks down during construction operations, or any other operation being undertaken within the 50 metre restriction zone of the main runway (from edge of main runway) to ensure timeous opening of the runway (during short term closures). The equipment shall as a minimum include:

- i. A low bed with winch that has sufficient capacity to remove a 30-ton roller.
- ii. Equipment (porta-pack) capable of releasing the hydraulics on a milling machine and undertaking the removal thereof from the runway.

The Contractor shall before the start of the construction operations, successfully demonstrate to the Engineer how he will remove any substantial item of plant (i.e. excavator, dozer, ADT's milling machine, roller or paver) from the runway or graded strip when it is in a broken down state. This operation must be completed within 1 hour from the request for removal.

The equipment required for this operation shall always be available on the airside of King Shaka International Airport for use in an emergency situation during a working shift where work is being carried out under short term closures on the runway or within a distance of 50m from the runway edge. Work on the runway and in the clearance zone will not be allowed if these requirements are not complied with.

The Contract shall fully comply with all requirements listed in Volume 5 Manual Of Procedures For Working Airside, the standard specifications and the project specific sections.

(b) Equipment Provided by the Employer

Nil

C3.4.4 EXISTING SERVICES

Specifications related to existing services are provided in the Project Specifications (Section C3.6; Clause A2.1.3)

C3.4.5 SITE ESTABLISHMENT

i. Services and Facilities Provided by the Employer

The location of and access to a proposed construction camp will be provided to the Contractor. Approval for the establishment of a construction camp must be obtained from ACSA. The Contractor is responsible for all arrangements for obtaining all necessary approvals,

establishment and subsequent removal and reinstatement of his construction camp. Note that services for water and sewer will not be free of charge, and the utilization of these services will be at the expense of the Contractor.

Other contractors may in part also use the proposed area. The Contractor must at all times limit his personnel, plant, equipment and materials at the Contractor's site or the working areas as approved by the Employer's Agent. No personnel shall be accommodated on airport property. Only guards approved by the Employer and on duty may be on site at all times. The Contractor shall only use the designated gate(s) for access purposes to the airside.

The area designated by the Employer's Agent can be used for stockpiling material for use in the works and for temporary parking of plant and equipment. This location is to be confirmed by the Employer.

All regulations and local authority ordinances, as regards smoke emissions and noise abatements shall apply and compliance will be enforced as well as height restrictions and any required obstacle markers.

Also refer to the requirements of Clause 3 of the **Procedure Manual for Working Airside (Volume 5)**.

ii. Facilities Provided by the Contractor

The requirements for facilities to be provided by the Contractor for use by the Employer and his agents such as office, ablution and laboratory facilities are stated in Part C3.6, Section A1.4.7.1.

The Contractor shall make his own arrangements for the supply of electrical power, water (see Clause A1.3.3), telecommunication services, ablution facilities, sewer services, first aid facilities and other services, the payment thereof and all reinstatements required upon completion. No direct payment will be made to the Contractor for the provision of electrical and other services. The cost thereof shall be deemed to be included in the rates and amounts tendered for the various items of work for which these services are required.

The Contractor will be required to erect a security fence around the construction camp and temporary parking area for plant and equipment. The cost thereof is regarded to be included in the relevant rates for establishment on site.

The storage of fuels in tanks may be kept in the Contractor's camp subject to the regulations of the Airport authorities that require a berm or wall around the installation sufficient to retain the capacity fuel of the tanks.

The Contractor shall make his own arrangements for telephone and facsimile facilities. Cellular phones will be acceptable, but the Contractor must obtain airside permits from ACSA at his own cost.

iii. Storage and Laboratory Facilities

The Contractor shall make a storage room available for use by the Employer's Agent's staff. A commercial laboratory shall undertake material testing for the Employer's Agent.

iv. Other Facilities and Services

The Contractor shall be responsible for the removal of all waste generated from the airport property and the proper disposal thereof elsewhere at his own cost.

If required by the Employer's Agent, the Contractor shall supply portable chemical toilet facilities next to the construction site for his staff as well as for the Employer's Agent's supervisory staff. These facilities must be erected and removed on a daily basis and regularly serviced to the satisfaction of the Airport Authorities and the Employer's Agent.

v. Vehicles and Equipment

The requirements (e.g. permits, etc.) for vehicles and drivers operating on the airside at King Shaka International Airport are specified in the Procedure Manual for Working Airside (Volume 5). The responsibility will however remain with the Contractor to ensure that all necessary requirements are met to bring any vehicles and equipment on site.

vi. Advertising Rights

Only one sign board for the Contractor and his subcontractors may be erected at the entrance to the construction camp. Also refer to Chapter 1, Part C1.3(COTO)and Item C1.3.2 of the Project Specification (C3.6).

vii. Notice Boards

A construction notice board complying with the SAICE specifications must be provided and erected at a position to be agreed with the Employer's Agent. The cost of the supply and erection of this notice board must be included in the establishment cost of the Contractor. Also refer to Chapter 1, Part C1.3 and Item C1.3.2 of the Project Specification (C3.6).

C3.4.6 SITE USAGE

Restrictions on the site usage are stated in the Procedure Manual for Working Airside (Volume 5).

C3.4.7 ALTERATIONS, ADDITIONS, EXTENSIONS AND MODIFICATIONS TO EXISTING WORKS

The Contractor must satisfy himself that the dimensional accuracy, alignment, levels and setting out of existing components are compatible with the proposed Works. Where this is not the case the Employer's Agent's Representative must be notified in writing at the earliest possible time.

C3.4.8 WATER FOR CONSTRUCTION PURPOSES

The Contractor must make all arrangements for the transport, storage and distribution of water required for construction purposes and for his own use and at his own cost (allowed for in the relevant tendered rates). Alternatively, water can be purchased from ACSA at a prescribed rate. Refer to Item A1.2.3.21 for further details.

C3.4.9 SURVEY CONTROL AND SETTING OUT OF THE WORKS

The Contractor shall place beacons in concrete, marked and certified by a professional land surveyor. Beacons shall be check-levelled during construction to confirm the accuracy when instructed by the Employer's Agent. Refer to A1.2.7.2 for further details.

C3.5: MANAGEMENT

C3.5.1 MANAGEMENT OF THE WORKS

(a) Planning and Programming

The Contractor's programme must be based on the interim milestone dates for completion specified in Table C3.5.1 below and the Working Times defined in the **Procedure Manual for Working Airside (Volume 5)**. Penalties will be imposed if these Interim Milestone dates are not achieved. Refer to Section C1.2 (contract Data), Sub-clause 5.13. **The Contractor is to insert Interim Milestone Dates in Table C3.5.1 below. These dates will be adjusted at time of award when the final programme is submitted by the Contractor and approved the Engineer and Client.**

Table C3.5.1: Interim Milestone Dates

Milestone Event	General Description of Work	Milestone Completion
		Interim Dates
Bravo Taxiway and Shoulders	Completion of all rehabilitation, surfacing, paint marking and replacing electrical elements	
Quebec Tie-in Area	Completion of all construction, surfacing, paint marking and electrical elements	
Drainage and ancillary work	Completion of all new drainage and maintenance of existing where necessary	
Foxtrot Apron Stand	Completion of all mechanical and electrical connections, commissioning and ensuring safety and compliance to the Apron	
Note: All indicative dates are to be used as a guide for sequencing of works. Final construction programme to be submitted by appointed contractor for approval by ACSA and Engineer.		

The Contractor must draw up his own programme that complies with all requirements of this project and which suits his own resources. Detailed specifications for the compilation and management of the construction programme are stated in Section C3.6 (Clause A1.2.7.1) and in Clause 4 of the Airside Manual (Volume 5).

(b) Sequence of the Works

The sequence of the Works will be determined by the logical order of activities and the specified Interim Milestone dates in Table C3.5.1. It is important to note that:

- (a) The contractor shall also allow time in its programme for trial sections of the asphalt mixes, stabilised layers (Cemented stabilised) and crushed stone base.
- (b) Some non-critical activities can be done in a different phase to those highlighted in TABLE C3.5.1 as long as that approval has been obtained from AM and subject to availability of escort from ACSA.
- (c) A minimum of seven (7) days advance notice from the contractor is required to switch between work areas.

(c) Methods and Procedures

The methods and procedures that must be complied with are contained in Volumes 2, 3, 4 and 5 of the contract documentation. These include but are not limited to:

- Methods and Procedures in the Standards Specifications (Volume 2, COTO).
- Civil Works Methods and Procedures in the Project Specifications (C3.6).
- Electrical Works Methods and Procedures in the Project Specifications (C3.6).
- Mechanical Works Methods and Procedures in the Project Specifications (C3.6).
- Occupational Health and Safety Specifications (C3.7.1).
- Environmental Work Instructions (C3.7.2).
- Manual of Procedures for Working Airside (Volume 5).

(d) Quality Plans and Control

The requirements for Quality Plans and Control are stated in Section A1.2.8 of the Project Specification (C3.6).

(e) Construction Method Statement

Within 14 days of the Commencement Date the Contractor shall submit a Construction Method Statement to the Employer's Agent for approval by the Employer. Once approved, this Statement will form part of Appendix C of the Procedure Manual for Working Airside (Volume 5). No work on the airside will be allowed until the Employer has approved this Construction Method Statement.

The Method Statement shall include:

- i. All measures to be implemented to comply with the requirements of the Procedure Manual for Working Airside (Volume 5).
- ii. All measures to be implemented to comply with the requirements of the OHS Act.
- iii. A contingency plan to deal with interruptions of shifts by inclement weather, plant breakdowns or emergency closures of the work areas.
- iv. Special measures, such as availability of back-up plant, to be implemented in normal shifts to comply with the Project Specifications.
- v. Measures and equipment that will be used on site to limit the ingress of water into the excavations and to remove rainwater from the excavations.
- vi. Measures to protect services (above and below surface) during construction.

- vii. Procedures to ensure that the whole work area is safe before removing staff or handing over of the site at the end of each work shift.
- viii. A watchman to remain on site of excavations/construction with telephone contact to the contract manager in case of emergency.
- ix. The cost of complying with the ACSA approved method statement is deemed to be covered by the tendered rates for the Contractor's General Obligations.

(f) Environment

The Environmental requirements are specified in ACSA Specifications (Section C3.7.2)

(g) Accommodation of Traffic on Roads and Accesses used by the Contractor

ACSA staff and other stake holders will also use the access road to the construction site and camp. It is therefore a requirement that the Contractor coordinate with all stakeholders on a daily basis (to be recorded at the daily meeting) on the usage of the roads by the Contractor's vehicles and construction equipment.

(h) Testing, Completion, Commissioning and Correction of Defects

Procedures for testing, completion, commissioning and correction of defects will be provided to the Contractor by the Employer's Agent on site.

(i) Recording of Weather

The Contractor shall provide an electronic mobile weather station. He shall erect them according to the requirements of the weather bureau. The Contractor shall record and keep a record of the daily rainfall and maximum/minimum temperatures and supply the data to the Employer's Agent on a daily basis.

The Contractor shall also record wind speed measurements on site as agreed with the Employer's Agent's Representative. Data can also be obtained from the local weather bureau but has to be recorded on site on a daily basis.

The cost of complying with these requirements is deemed to be covered by the tendered rates for the Contractor's General Obligations.

(j) Format of Communications

All instructions or requests need to be confirmed in writing through:

- Site instructions.
- Requests for inspections.

(k) Key Personnel

The Contractor, Employer's Agent and Employer must compile a schedule of their Key Personnel with their contact numbers and keep it updated as per requirements for the contact list in Volume 5 – Procedure Manual for Working Airside. The list must be made available to the Employer's Agent, Employer and Contractor.

(l) Management Meetings

The following formal meetings will be held at the office of the Employer's Agent's Representative between the representatives of the Employer, Employer's Agent and the Contractor:

- Daily kick-off meeting (One hour before the start of a shift).
- Weekly progress meeting (Two hours before the start of a shift).
- Monthly site meeting (Date and time to be agreed by attendees).
- Monthly technical meeting (Date and time to be agreed by attendees).

The representatives must have the necessary delegated authority in respect of aspects such as planning, change management and health and safety.

(m) Daily records

The Contractor must keep daily records of resources (people and equipment employed) and site diaries in respect of work performed on the site. A copy of the previous day's daily record must be provided to the Employer's Agent on a daily basis.

(n) Bonds and Guarantees

Original copies of the bonds and guarantees must be lodged at the office of ACSA, King Shaka International Airport and one copy of each must be kept on site with the Employer's Agent's representative. On release, the bond and guarantees can be collected from ACSA.

(o) Payment Certificates

The Employer's Agent's certificate will be issued only after receipt by him of a draft certificate prepared by the Contractor at his own expense in the form prescribed by the Employer's Agent. The cost of duplicating and delivering copies of the certificate to the Contractor, the Employer's Agent and the employer shall be borne by the Contractor. The Employer's Agent and the employer shall require three (3) sets of A4-sized paper copies in total.

(p) Permits

All requirements in connection with the application for and usage of permits are stated in the Airside Manual (Volume 5) and Chapter 1, C1.2 General Requirements and Provisions, A1.2.3.7 (Project Specification C3.6).

(q) Insurance Provided by the Employer

For information on the Employer Insurance, refer to Clause 35.1 Section C1.2.

(r) Sectional Practical Completion and Handover

In accordance with the scope of works under Tender No. KSIA7806/2025, the Employer reserves the right to accept sectional Practical Completion for discrete components of the Works. Accordingly, the Works are divided into the following four key sections:

1. Rehabilitation and Completion of Bravo Taxiway
2. New Construction of Quebec Taxiway
3. Completion of Foxtrot Apron
4. Construction of the Stormwater Channel and Associated Drainage Infrastructure

Each of the above sections may be considered independently for Practical Completion as per the original approved Construction Programme. The Practical completion will be subject to the Employer's Representative being satisfied that:

The relevant section is fully complete, defect-free in so far as reasonably practical, and compliant with the Employer's Requirements;

All testing, commissioning, and inspections for that section have been successfully concluded; Access, safety, and operational integrity are restored to a condition that permits safe airside operations.

Upon such determination, a Practical Completion Certificate will be issued specific to that section. Once issued, the section shall be formally handed back to the Employer and shall be deemed complete for the purpose of use, maintenance responsibility, and commencement of the defect's liability period for that section.

This clause enables progressive handover, supports operational continuity, and facilitates early Employer use of critical infrastructure components. The Contractor is required to programme and sequence the Works to support this sectional handover strategy.

C3.5.2 HEALTH AND SAFETY

(a) Health and Safety Requirements and Procedures

Health and Safety requirements and procedures are presented in Annexure A, Section C3.7.1.

(b) Barricades and lighting

Requirements for the provision and usage of barricades and lighting are stated in **Volume 5** and **Chapter 1 of the Standard Specifications**.

(c) Traffic Control

Safety requirements and procedures where the Contractor has occupation of taxiways, runways or roads are stated in **Volume 5** and **Chapter 1 of the Standard Specification**.



AIRPORTS COMPANY SOUTH AFRICA

AIRPORTS COMPANY SOUTH AFRICA

KING SHAKA INTERNATIONAL AIRPORT

TENDER NO: KSIA7806/2025/RFP

PROCUREMENT OF A CIDB GRADE 9 CE CONTRACTOR THE COMPLETION OF BRAVO TAXIWAY EXTENSION AT KING SHAKA INTERNATIONAL AIRPORT FOR A PERIOD OF 12 MONTHS

C3.6A: PARTICULAR (PROJECT) SPECIFICATIONS: CIVIL

General note: The Standard Specifications as well as the Particular (Project) Specifications refer to the 'Engineer' whereas the General Conditions of Contract for Construction Works, 2015, Third Edition, (GCC 2015) refer to the 'Employer's Agent'. In all cases where reference is made to the Engineer in the Standard Specifications or the Project Specifications, it shall have the same meaning as the Employer's Agent as defined in the General Conditions of Contract.

SECTION A: SPECIFICATION AMENDMENTS

SECTION A1: STANDARD AMENDMENTS ISSUED BY COTO

Notes to Tenderer:

1. The Standard Specifications for Road and Bridge Works for South African Road Authorities (Draft Standard October 2020 edition) prepared by the Committee of Transport Officials, (COTO), as amended, shall apply to this contract. The amendments are those issued by COTO and reproduced in Section A1, together with additional amendments as set out in Section A2 and Project specific Specification Data as set out in Section B.
2. In the event of a discrepancy between the Specifications (including the Project Specifications) and the drawings and / or the Bill of Quantities, the discrepancy must be brought to the Employer's Agent attention to be resolved.

SECTION A2: PROJECT SPECIFICATION AMENDMENTS TO THE COTO STANDARD SPECIFICATIONS

Notes to tenderer:

1. This Section A2 contains amendments to the Standard Specification, including additional clauses, amendment to clauses or deletion of clauses and specifications, required for this particular contract. Where the Standard Specifications allow a choice to be specified in the Contract Documentation or Project Specifications, between alternative materials or methods of construction, and for additional requirements to be specified to suit a particular contract, these selections are not made in this Section A2. Details of such alternatives or additional requirements applicable to this contract are contained in.

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COTO CHAPTER 1: GENERAL

SECTION 1.1: GENERAL PREAMBLE

PART A: SPECIFICATIONS

A1.1.2 DEFINITIONS

*Add the following definitions and terms to Section A1.1.2 of the Standard Specifications:
(Also refer to the definitions provided in the Airside Manual – Volume 5):*

CARRIAGEWAY AND FREEWAY – Shall also mean the asphalt surface areas of the runways, taxiways and the concrete aprons.”

ROAD PRISM – “The road prism shall also mean the prism of the runways, taxiways and aprons.”

AIRPORT ROADS – Airport roads are defined by a network of public and non-public roads within the airport boundary providing access to the various airport buildings or areas.

AIR TRAFFIC – Means all aircraft in flight or operating on the manoeuvring areas of an aerodrome.

CONTROL TOWER – Means an air traffic control unit established to provide an air traffic control service.

INSTRUMENT LANDING SYSTEM CATEGORY I (ILS CAT I) – Means an approach and landing aid designed to identify an approach path for exact alignment and descent of an aircraft making a landing with a runway visual range of 800 m and a decision height of 60 m.

INSTRUMENT LANDING SYSTEM CATEGORY II (ILS CAT II) – Means an approach and landing aid designed to identify an approach path for exact alignment and descent of an aircraft making a landing with a runway visual range of 400 m and a decision height of 30 m.

INTERNATIONAL CIVIL AVIATION ORGANISATION (ICAO) – Means a specialised agency of the United Nations with a membership of 183 Contracting States as of August 1994.

LANDING AREA – Means that part of a movement area intended for the landing or taking off of aircraft.

THRESHOLD – The threshold is the beginning of that portion of the runway used for the take-off and landing of aircraft. The clearway is the area beyond thresholds.

PARTY, PARTIES AND THIRD PARTY – ‘Party’ and ‘Parties’ means the Client and the Consultant, and ‘Third Party’ means any other person or entity as the contract requires.”

PART C: MEASUREMENT AND PAYMENT

C1.1.3 PAYMENT

Add the following paragraph to the Clause C1.1.3.2:

VAT shall be excluded from the rates and added as a lump sum to the total value of work measured for payment.

Add the following subclause

C1.1.3.5 Payment for materials on the Site

Clause C1.1.3.9 will be applicable to all scope of works which includes civil, electrical and mechanical for the completion of the entire project.

In the last sentence of the 1st paragraph, delete the following:

or, in the case of crushed stone which has not been purchased but has been produced on the site, at 80% of a fair evaluation of such crushed material

Add the following new subclauses:

C1.1.3.9 Reduced payments for substandard work

Clause C1.1.3.9 will be applicable to all scope of works which includes civil, electrical and mechanical for the completion of the entire project.

Where provision for reduced payments for substandard work is made in the Contract Documentation, acceptance of reduce payment for substandard work may be accepted by the Engineer subject to prior approval by the Employer.

C1.1.3.10 Rates to remain unchanged when scope of work changes

Clause C1.1.3.10 will be applicable to all scope of works which includes civil, electrical and mechanical for the completion of the entire project.

Dependent on the rates and prices offered in the Pricing Schedule, the Employer intends to increase or reduce the scope of work to match the budget allowed for this project. To this end the Contractor has been provided the opportunity to price separately for unit rates of work and the establishment of major plant. The value of such increase or reduction in the scope of works shall not give cause for the Contractor to vary the offered rates and prices, which shall remain final and binding for the duration of the contract, provided that:

- (i) Notification of the change to the scope of work is given in writing within 28 days of the tender closing date.
- (ii) The value of the increase or reduction in the scope of work does not alter the tendered sum by more than 20%.

C1.1.3.11 Procurement of sub-services and omitted rates (Second tier procurement) – Applicable to all Scope of Works – Civil, Electrical and Mechanical

Clause C1.1.3.11 will be applicable to all scope of works which includes civil, electrical and mechanical for the completion of the entire project.

Second tier procurement include the procurement of any work where either the particulars of the work is not scheduled and priced, or where the process of procurement of the sub-service provider is specified elsewhere in the contract specification. It include the procurement of work where rates have been

omitted or where allowance for the work is made under a Provisional sum or Prime sum item or where allowance for the work is made under a Provisional sum or Prime sum item but the particulars of the work is not scheduled, or where work is instructed under clause 13[Variations and Adjustments] or where work is to be performed by Targeted Enterprises.

The following procurement methods is to be followed as appropriate:

- a) **Where the particulars of the work is not scheduled but existing rates for similar work exist in the contract and the work can therefore be executed by the contractor or his sub-contractor at the existing contract rates.**

No separate procurement process is required. The work is to be quantified and scheduled utilising existing rates and approved through the Variation Order Authorisation process.

- b) **Where the payment calculation is based on a formula specified in the contract document, or where the payment rate is pre-determined or fixed by the client.**

No separate procurement process is required. The work is to be quantified and approved through the Variation Order authorisation process.

- c) **Where the supplier is not selected by the contractor and actual cost is reimbursable and/or no procurement process is possible.**

No separate procurement process is required. The work is invoiced by supplier on completion and approved through the Variation Order Authorisation process at the end of the contract.

- d) **Where there are omitted items as part of the existing scheduled scope of work and no existing rates for similar work exist in the contract, or where there are no existing rates for the materials to be supplied and suitable rates for material to be determined.**

A proposal for a new rate shall be submitted by the contractor and evaluated by the engineer, by comparing with either adjusted relevant rates in the contract, or by comparing with similar rates on similar contracts, or by comparing three informal quotes to substantiate the rate. The new agreed rate is approved through the Variation Order Authorisation process.

- e) **Where the particulars of the work is not scheduled and the estimated cost of the work (including VAT and excluding Contract Price Adjustment) is equal or less than R1,000,000.00 and there are no existing rates for similar work and the contractor's proposal submitted in terms of the Contract is not accepted and the work is to be performed by a sub-contractor.**

A minimum of three quotations shall be obtained from Targeted Enterprises). The following is the minimum requirements for this process:

- Prequalification for BEE level 1 or 2 and EME or QSE (Approval to deviate must be granted by the Employer, based on market research)
- Quotation to include form of quotation, CSD registration, CIDB (where applicable),

A Variation Order shall be approved prior to execution of the work.

- f) **Where the particulars of the work is not scheduled and the estimated cost of the work is more than R1,000,000.00 (including VAT and excluding Contract Price Adjustment) and there are no existing rates for similar work and the contractor's proposal submitted in terms of the Contract is not accepted and the work is to be performed by a sub-contractor.**

The work is to be procured through a tender process. The following is the minimum requirements for this process:

- Prequalification for BEE level 1 or 2 and EME or QSE (Approval to deviate must be granted by the Employer, based on market research)
- Tenders to close at the relevant site offices at a specific date and time
- Tender documents to include form of Offer, CSD registration, Tax compliance, CIDB (where applicable), SBD1, SBD 4, SBD 6.2, BEE certificate, Form A2.2
- Tenders to be evaluated on price and preference
- Evaluation by contractor for review by engineer

A Variation Order shall be approved prior to execution of the work.

- g) **Where the particulars of the work is identified by the contractor to be performed by subcontractors who are Targeted Enterprises to form part of the specified Contract Participation Goals for Targeted Enterprises.**
- h) **Where the work is unforeseen, urgent and the relevant procurement method as indicated above will result in a delay to the contract and payment for a claim for extension of time and/or cost, or where the above procurement methods are not applicable or cannot fully be complied with.**

The Employer will determine the most appropriate procurement process to be followed and approved through the Works Authorisation process

A1.1.2 GENERAL CONDITIONS OF CONTRACT

Add the following:

The General Conditions applicable to this Contract are the General Conditions of Contract for Construction Works, 2015, Third Edition, (GCC 2015).

Accordingly, all reference in the Standard Specifications to any other General Conditions of Contract (GCC) has to be amended. The Standard Specifications have been scrutinised and clauses which refer to another GCC, identified. These are tabulated below together with the relevant equivalent clause in the GCC 1998 Conditions of Contract. The context of the reference to the GCC is also noted.

Whereas every effort has been made to include all of the affected clauses in the table, there may be some omissions. In every case, however, the GCC 2015 Conditions of Contract for Construction, as amended by the Special Conditions of Contract in Section C1.2 of this Volume, shall apply and the contractor shall be responsible for interpretation of the equivalent clause.

SECTION 1.2: GENERAL REQUIREMENTS AND PROVISIONS

PART A: SPECIFICATIONS

A1.2.3 GENERAL

Clause A1.2.3 and relevant sub-clauses will be applicable to all scope of works which includes civil, electrical and mechanical for the completion of the entire project.

A1.2.3.4 Extension of time for delays caused by rainfall and delays caused by actions of airport authorities

Clause A1.2.3.4 will be applicable to all scope of works which includes civil, electrical and mechanical for the completion of the entire project.

Delete the entire clause and replace with the following:

Change the existing heading of clause A1.2.3.4 to read as above and make the following changes to b) Method 2 (Critical-path method with consequential delays) which will apply to this Contract:

Add the following as a new paragraph:

"Extension of time resulting from abnormal rainfall, very cold weather or other forms of inclement weather shall be calculated according to the requirements of Method 2 (Critical-path method). The value of "n" working days per calendar month as specified in this clause shall be as given in Table A1.2.3.4/1 below. If no abnormal rainfall or other inclement weather periods occur during a specific calendar month (or months), the n-values as specified shall not be taken as accumulating over the contract period. If the "n"-days allowed for in the programme of work are not taken up by standing time due to abnormal rainfall or inclement weather conditions, they will fall away and will not be considered in extension of time claims that may arise later during the contract period.

Table A1.2.3.4/1: Average delays due to inclement weather ('n')

Month	Jan	Feb	Mar	7	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Tot
Inclement Weather Delays	4*	3	3	2	2	1	1	2	2	3	3	1*	27
Average Rainfall	134	113	120	73	59	28	39	62	73	98	108	102	1009mm

* The number of days lost allows for the annual statutory Construction holiday in December and January each year.

Rain days allowed used >5mm days but has been adjusted to meet expected normal days worked per month as well as public holidays and normal December shut down as well as limited inclusion of days for <5mm.

The value 'n' is the average number of days on which it is expected that there will be inclement weather at King Shaka International Airport. No paving will be allowed if the weather conditions unfavourable as per the specifications.

The Engineer's Representative will certify a shift loss due to cold weather, abnormal rain or adverse weather conditions based on the following criteria:

- (i) No work was possible during the relevant shift on any item which is on the critical path according to the latest approved construction programme, given that sufficient temporary drainage of work areas was provided, or if
- (ii) Less than 50% of the work force and plant planned for that specific shift could work.

Actual extensions of time due to inclement weather shall be agreed between the Engineer's and Contractor's representatives on the site. The agreed shifts or parts thereof shall be recorded at the bi-weekly site meetings and adjustments made to the contract period on a bi-weekly basis by extending the contract period according to the number of shifts lost less the allowance 'n'. At the end of the contract, the Engineer shall prepare a variation order to formalise the payment of the accumulated delays in excess of the allowance due to inclement weather.

Extension of time resulting from delays during shifts caused by operations of the Airport shall be allowed for in the contractor's programme. The number of working days to be allowed for in the Contractors programme is 20 days for the full contract period. The criteria listed in (i) and (ii) above will also apply to this extension of time. Losses within the 20 days delay period are deemed to be covered in the rates tendered for the items of work. **No extension of time, with associated costs, will be claimable until such time that the 20 days has lapsed.**

Time lost during shifts shall be agreed between the Engineer's and Contractor's representative on site. The agreed shifts or parts thereof shall be recorded at the bi-weekly site meetings and adjustment made to the contract period on a bi-weekly basis by extending the contract period according to the number of shifts lost less the allowance. At the end of the contract, the Engineer shall prepare a variation order to formalise the payment of the accumulated delays due to Airports operations. Losses for the first half-hour of delay are deemed to be covered in the rates tendered for items of work.

If the approved total extension of time (for delays due to inclement weather and Airport operations) extend the completion date beyond the start of the contractor's holiday in December, the holiday period shall not be considered as working days. Any remaining extension of time at this date shall be calculated from the first statutory working day in January the following year, provided that the contractor has shown in his programme that he intends to close during the traditional Christmas/New Year break.

A1.2.3.10 Notices, Signs and Advertisements

Clause A1.2.3.10 will be applicable to all scope of works which includes civil, electrical and mechanical for the completion of the entire project.

Delete the final paragraph and replace with the following:

All signboards erected in accordance with the drawings or as approved advertisements for the Contractors establishment, shall be removed at the same time as the Contractors de-establishment. Payment Item C1.3.1 for the final instalment of 15% of the tendered lump sum shall not be made unless all the advertisements, notices and temporary signs have been removed.

A1.2.3.21 Water

Clause A1.2.3.21 will be applicable to all scope of works which includes civil, electrical and mechanical for the completion of the entire project.

Add the following to the first paragraph:

Water for construction purposes will be made available near the site camp. The contractor will include in his rates for any connections, couplings or a standpipe and will provide a water metre to measure the water used for construction purposes. Water will be purchased from ACSA at an agreed rate per kilolitre at the time of award. The contractor shall allow in his rates for annual municipal increases. ACSA will invoice the contractor on a monthly basis for use of water. The first municipal water increase will be on 1 July 2025.

Add the following new subclause after A1.2.3.23:

A1.2.3.24 Reference manuals, other specifications and test methods

In various chapters of this Standard Specification, reference is made to Manuals, other specifications, and test methods. If not otherwise indicated in the Contract Documentation, the latest published Manual, other specifications, and test methods at time of close of tender will apply. Any changes to be implemented on a project as a result of revisions to manuals, other specifications and test methods, will be handled in terms of the Conditions of Contract.

Certain TRH and TMH documents are published as Sabita Manuals/TRH or Sabita Manuals/TMH publications. Where reference is made to the TRH or TMH document, it shall be read as referring to the latest version of the Sabita Manual/TRH publication or Sabita Manual/TMH publication, respectively.

Add the following subclause.

A1.2.3.25 Contractor's Escorts

Clause A1.2.3.25 will be applicable to all scope of works which includes civil, electrical and mechanical for the completion of the entire project.

Escorts will be provided by ACSA to lead the construction team onto site and to serve as official communications port between the construction team and Air Traffic Control or Airport Management. The construction team will not be allowed to enter or operate on the airside facilities unless being escorted by a qualified ACSA escort.

Under special circumstances, the Contractor may be allowed to nominate one or more persons (own site management staff or others) to accept the duties and responsibilities of an escort if and when required by the Employer. The following conditions will apply:

- (a) The nominated person/s (Contractor's escort) need to have passed the applicable training and examination as specified by Airport Management (including induction course, radio communications, etc.).
- (b) The Contractor's escort shall have a vehicle suitably equipped for driving airside. Equipment shall include amongst others a suitable communication device as specified by ATC required to communicate with Air traffic Control and Airport Management, signage and lights.
- (c) The Contractor's escort may only be used if Airport Management is not able to provide the required escort services if and when required by the Contractor. The Contractor needs to be provided with written approval by the Engineer before the Contractor's escort will be allowed to substitute the official airport management's escort.
- (d) The Contractor's escort shall at all times be in radio contact with Air Traffic Control and the Engineer's safety controller and physically with the construction team. He will not be allowed to leave the site until such time that he has been relieved of his duties by a replacement escort and if approved by Air Traffic Control.

The Contractor will be able to recover the cost of carrying out the duties and responsibilities of the Contractor's escort in the Bill of Quantities.

A1.2.7 EXECUTION OF THE WORKS

A1.2.7.1 PROGRAMME OF WORK

Clause A1.2.7.1 will be applicable to all scope of works which includes civil, electrical and mechanical for the completion of the entire project.

(c) Scheme 2

Add the following to the clause:

When drawing up his programme, the Contractor shall, inter alia, take into consideration and make allowance for:

- (i) Working times and all other constraints stated in Volume 5.
- (ii) Requirements of new Clause A1.2.7.6.
- (iii) Expected weather conditions and their effects (Clause A1.2.3.4).
- (iv) Paving at night during and surfaces temperatures.
- (v) Known physical conditions or artificial obstructions.
- (vi) The accommodation and safeguarding of public and air traffic.
- (vii) Dealing with, altering and installing services.
- (viii) The work to be undertaken by any sub-contractors. This work must be integrated into the programme of the main contractor.
- (ix) All other actions required in terms of this contract.
- (x) Interim milestone dates and restrictions on the extent of work areas available at a given time (Section C3.5.1).
- (xi) Airside access for "normal hours" working as follows (if required):
 - Monday – Sunday: Sunrise to Sunset (however not to commence before 06:00hrs)
 - Limited taxiway work if instructed works by ACSA or the Engineer.
- (xii) Airside access for "after hours" working as follows:
 - Monday – Sunday:
 - Quebec Tie-in - 22:00 hrs and Off 04:00 hrs – 7 days a week
 - Selected areas of Bravo Taxiways close to November Taxiway and Alpha Taxiway - 22:00 hrs and Off 04:00 hrs -7 days a week
 - Selected areas of proposed Apron Foxtrot Stand - 22:00 hrs and Off 04:00 hrs - 7 days a week

Specific reference is made to Drawing KSIA-CIV-PP-033 - CONSTRUCTION PHASING AND TEMPORARY TRAFFIC CONTROL PLAN for phasing and planning of normal hours and after hours works.

The above hours of access to airside may be later due to delayed aircraft etc. In addition, the vacation times on Saturday and Sunday mornings may be extended by 1 hour and 2 hours respectively. For programming purposes, the above times should be adopted.

The following details shall be submitted together with the programme:

- (i) The number of working hours per day, working days per week, assumed holiday or shut down periods on which the programme is based.
- (ii) The overall labour and major plant resource levels on which the programme is based.
- (iii) The detailed traffic and construction equipment accommodation proposals on which the programme is based.
- (iv) Sequence of work area closure to air traffic.

The Contractor shall base his initial programme of work on the scope of the work as described in the

Scope of Works and the Bill of Quantities. This programme shall be reviewed on a regular basis by the Contractor in accordance with changing circumstances, delays and amendments to the work ordered by the Engineer as a result of further examinations made by him.

Minor revisions to the approved programme may be introduced from time to time by mutual agreement between the Contractor, and the Engineer. Should the Engineer believe that a major revision of the programme is required, the Contractor will be notified in writing, and a revised programme shall be submitted within two weeks of receipt of such a notification.

It should be noted that it is in the Contractor's interest to provide a comprehensive programme giving as much information as possible about the times allowed for the various activities as well as resources or other limitations affecting the programme, since the approved programme may be used to evaluate any claims in terms of the General Conditions of Contract for extensions of time.

Monthly Meeting Programme:

The Contractor shall submit to the Engineer, before each monthly site meeting (or whenever instructed) copies of the following:

- (i) The Contract programme with progress charts and programme graphs updated to reflect the actual progress to date.
- (ii) A summary of progress on site over the week preceding the site meeting. The report shall be in the form of a detailed narrative to the Contract programme.
- (iii) Details of activities running late, indicating what steps have been or will be taken to ensure that the work is completed within the specified time.
- (iv) A report on all labour, plant and materials on site.
- (v) An Incident and or Accident Report that is fully detailed.

Weekly Meeting (Fortnightly Rolling) Programme)

This programme will be presented at the weekly meetings and will show the work programmed over the next fortnight. It will be updated weekly. This programme will show the activities planned for each shift in a specific area, and will be subject to correlation with flight-schedules by the Airport Manager. The programme will show actual, projected and previous work.

Add the following subclause:

(e) Safety and Contingency Plan

Within 14 days of award of the contract the Contractor shall draw up and submit a detailed Construction Method Statement addressing i.e. safety and contingency plan to ACSA for approval. Once approved, the Construction Method Statement will form part of the Procedure Manual for Working Airside (Volume 5). The method statement shall include:

- (i) All measures to be implemented to comply with the requirements of the OHS Act (C3.7.1), Environmental requirements (C3.7.2) and the Procedure Manual for Working Airside (Volume 5).
- (ii) A contingency plan to deal with shifts interrupted by inclement weather, construction equipment breakdowns or emergency closures of the work areas.
- (iii) Special measures, such as back-up plant, to be implemented in normal shifts to comply with the specifications.

No work on the airside will be allowed until the Employer has approved the contractor's Construction Methodology Statement.

The cost of complying with the ACSA approved method statement is deemed to be covered by the tendered rates for the contractor's general obligations.

The scope of work requires the temporary closure of certain facilities on the airside. The closure of any facilities and the period of such closures shall be arranged with the air and surface traffic control authorities. Minimum notification periods are included in Volume 5.

All construction works around the Quebec Taxiway must be planned and executed in such a manner that the airport runway remains operational. No open excavations may be left exposed overnight within 50 metres of the operational runway. Failure to comply with this buffer will result in the aircraft unable to land. This is a critical operational safety constraint. Depending on the Contractor's chosen methodology, bidders must take this into account when pricing for Quebec night works, as this affects the rate build-up, programme planning, and resourcing. Compliance will be strictly monitored

A1.2.7.2 Setting out of the Works and the protection of beacons

Clause A1.2.7.2 will be applicable to all scope of works which includes civil, electrical and mechanical for the completion of the entire project.

Add the following to this clause:

In order to comply with Clause A1.2.7.2 of the Specification the Contractor shall contract or employ a professional land surveyor and supporting team who will check the reference and level beacons. Agreement shall be reached with the Engineer on the values of the beacons to be used. It is the Contractor's responsibility to maintain and protect all reference beacons.

There are a limited number of official reference and level beacons on the airport. Where necessary the Contractor shall place additional reference beacons on all sides of the work areas for accurate setting out and levelling purposes. These beacons shall be placed in concrete, marked and certified by a professional land surveyor. Beacons shall be check-levelled during construction to confirm the accuracy when instructed by the Engineer.

All existing paint markings shall be referenced prior to any paving activities for setting out after the completion of the overlay. The contractor shall provide a survey of the existing markings to the Engineer who shall then review and amend as necessary before providing the final marking drawings. Setting

out of the final paint marking positions must be done as specified on these supplied drawings. These shall be checked and agreed with the Resident Engineer in writing before final application.

Add the following new clauses:

A1.2.7.6 Project criteria and requirements at operational airports

Clause A1.2.7.6 will be applicable to all scope of works which includes civil, electrical and mechanical for the completion of the entire project.

Note the special Safety Regulations in Volume 5 will strictly apply to this Contract. In the case of conflict with the following clauses Volume 5 will supersede this section.

Where work has to be executed on or in the vicinity of an operational airport, such work shall be subject to various special conditions and regulations as listed below in order to guarantee and safeguard the operation of the airport at all times.

The following criteria should be borne in mind when the programme is compiled

(a) Airport management and air traffic control responsibilities

The Airport Manager (AM) and the Air Traffic Controller (ATC) are ultimately responsible for the safe and efficient operation of the airport.

The AM or designated representative will in his official capacity have authority to give the Contractor verbal or written orders on matters concerning the operation, security or safety of the airport and the Contractor shall, after having informed the Engineer of the orders, carry out the instructions as if issued by the Engineer.

The ATC is responsible for the safe movement of all aircraft traffic, both in the air and whilst on the ground. The ATC shall at all times have absolute authority regarding the movement of any construction personnel, vehicles or equipment, where such movement takes place within the obstruction free areas of existing facilities, or may affect the safe movement of the air traffic, and his instructions shall be implicitly obeyed. The ATC's decision regarding the acceptability and programming of the Contractor's activities within the above-mentioned areas shall be taken into account and may result in reprogramming of work, where considered necessary.

All liaison with the AM or ATC shall be arranged through the Engineer and the Contractors Traffic Safety Officer.

(b) Radio communication on the airport

Refer to Clause 14 of Procedure Manual for Working Airside Volume 5.

Two handsets must be provided to the Engineer for this purpose and must be handed over in a working condition to the Employer at the completion of the Contract. The Contractor's traffic safety officer and the Construction Manager shall complete a radio operator's basic course at ACSA before commencement of the works. The Contractor shall be responsible for any maintenance costs, damages or loss of these sets. Payment Item C1.2 shall be deemed to include all costs of the Contractor in this regard (including training of relevant personnel).

(c) Airport security

Refer to Clause 16 of Procedure Manual for Working Airside Volume 5.

(d) Movement on the airport

Refer to Clause 17 of Procedure Manual for Working Airside Volume 5.

The crossing of any operational facility on the airport will require special control as ordered by the ATC or the airport manager and will be limited to pre-determined points as indicated on the drawings or instructed by the Engineer. The required controls may include any of the following:

- (i) Unrestricted crossings used by the Contractor should be linked with a pre-warnings system that notifies the Contractor that the facility will be required for airport use within a certain period after notification.
- (ii) Flagmen at crossing points, allowing movements across the facility whenever aircraft traffic permits.
- (iii) Radio controlled crossing points, where movements across the facility may only take place after receiving clearance from the ATC.

(e) Additional requirements regarding construction activities

- (i) Identification numbers

All construction vehicles and self-propelled equipment to be utilised within the airport security area shall be fitted with a boldly displayed identification number (minimum dimension 600 mm, line thickness 75 mm) on a white background on either side of the vehicle or equipment. A record of all identification numbers and related vehicles shall be available at all times for perusal by the authorities or the Engineer. The cost for providing and using these identification numbers must be included under Pay Item C1.3.1.

- (ii) Crossing points

The surface of existing facilities at crossing points shall be absolutely clean whenever aircraft uses them. This will require the full-time presence of a cleaning team at such crossings to remove all debris, stones or other material from the surfaces. The Contractor shall be responsible for any damage to aircraft or other equipment as a result of failure to comply with this requirement.

- (iii) Barricades, lights and markings

The Contractor shall provide, erect, maintain, move and finally remove temporary barriers, fences and markings all as prescribed by the airport authorities or as shown on the drawings. The work shall include the placing of temporary barriers where runways or taxiways have been closed as well as lights at these points to facilitate night-time interpretation of the situation. It may also include the painting of markings and the final removal thereof.

- (iv) Dust and pollution

The Contractor shall control dust in all working areas, at borrow pits and on haul roads to the satisfaction of the airport authorities. No pollution from machines, batching plants, mixers, workshops or other sources (such as the breaking up of existing work) will be tolerated. Fires may only be lit after the Contractor has obtained written permission from the airport authorities who will also supervise the fires.

The Contractor shall keep the entire site of the works, including his own camp site, in a neat and clean condition to the satisfaction of the airport authorities.

- (v) Windrow of material

During the improvements of the side strips for Taxiway and Tie-in area, materials will be temporarily windrowed outside the work areas. No windrows shall be allowed within 37.5 m of the runway edge of both runways of any threshold. Windrow heights shall also be managed to ensure that they do not exceed ACSA maximum obstacle height requirements.

(f) Traffic safety officer

Refer to Clause 9.8 of Volume 5.

A traffic safety officer shall be appointed by the Contractor. This person shall be a senior member of the site management team who has been duly authorised to perform his duties on his own initiative and to exercise control over others. He must also complete a communications training course successfully at the Airport Control Centre after which a license will be issued to him. He shall be on site full-time during the execution of the works and general site safety shall at all times be his first priority. The traffic safety officer shall liaise directly with the Engineer, airport control and air traffic control regarding matters related to safety.

In addition to the tasks specified in the Airside Manual the traffic safety officer will also be required to perform the following duties and this list shall not be deemed to be complete:

- (1) Responsible for keeping the traffic requirements up to specification 24 hours a day, 7 days a week.
- (2) Inspect and report to the Engineer on the state of all required signs and marks (and all traffic accommodation facilities) as often as the Engineer may require but, in any event not less than twice a day.
- (3) Responsible for exercising control over the safe movement of personnel vehicles and plant on site according to the instructions of air traffic control.
- (4) Attend to the training and performance of flagmen and all other personnel involved in the control of traffic.
- (5) Responsible for compliance with prescribed measures at aircraft crossings.
- (6) Responsible for compliance to air traffic controller's instructions.
- (7) Responsible for daily final inspection of work areas prior to re-opening thereof.

(g) Provision of Permits

The Contractor shall note that it is a condition of the contract that he applies for and obtains the required permits for all persons, equipment and vehicles to be utilized during the construction of the planned works. Refer to Clause 17.2 of the Airside Manual (Volume 5).

The onus shall be on the tenderer to verify these costs prior to completing his tender, but the following are typical costs which could apply:

KSIA PERMIT PRICE LISTING - 2024-2025			
PERSONAL PERMITS			
PERMIT TYPE	DURATION	PRICE EXCL.VAT	PRICE INCL.VAT @15%
Personal Permanent Permit (New)	2 years	R188.76	R217.07
Personal Permanent Permit (Renewal)	2 years	R232.76	R267.67
Temporary Personal Permit	1 day	R156.13	R179.55
Temporary Personal Permit	2 - 5 days	R208.76	R240.07
Temporary Personal Permit	6 days	R188.76	R217.07
Permit Icon		R44.00	R50.60
Embassy Permit	2 years	R341.05	R392.21

VEHICLE PERMITS

PERMIT TYPE	DURATION	PRICE EXCL.VAT	PRICE INCL.VAT @15%
Airside Vehicle Permit	1 year	R3 581.04	R4 118.20
Airside Vehicle Permit Add-on fee	1 year	R736.84	R847.37
Air Vehicle - Temporary Permit	1-3 months	R526.00	R604.90
Air Vehicle - Temporary Permit	3-6 months	R1 052.00	R1 209.80
Air Vehicle - Temporary Permit	1 day	R166.66	R191.66
Air Vehicle - Temporary Permit	2 days	R166.66	R191.66
Air Vehicle - Temporary Permit	3 days	R166.66	R191.66
Airside Vehicle Permit - Change of Vehicle Registration		R65.78	R75.65

PARKING PERMITS			
PERMIT TYPE	DURATION	PRICE EXCL.VAT	PRICE INCL.VAT @15%
Staff Parking Permit	1 year	R1 909.36	R2 195.76
Staff Parking Permit	1 month	R159.11	182.98
Basement Parking Permit	1 year	R396.52	R456.00
Basement Parking Permit	1 month	R30.00	R34.50

LOST / DAMAGED PERMITS			
PERMIT TYPE		PRICE EXCL.VAT	PRICE INCL.VAT @15%
Damaged Personal Permit		R229.82	R264.29
1st Lost Personal Permit		R317.00	R364.55
2nd Lost Personal Permit		R493.00	R566.95
3rd Lost Personal Permit		No issue	No issue
1st Lost Airside Vehicle Permit/ Replacement cost		R816.31	R938.76
2nd Lost Airside Vehicle Permit/ Replacement Cost		R904.33	R1 039.98
3rd Lost Airside Vehicle Permit		No issue	No issue
Lost Embassy Permit		R374.98	R431.23
Damaged Airside Vehicle Permit		R87.09	R100.15

PENALTIES			
PERMIT TYPE		PRICE EXCL.VAT	PRICE INCL.VAT @15%
Expired Personal Permit		R2 986.50	R3 434.48
Failure to Cancel and Return Personal Permit not in use		R13 618.44	R15 661.21
Failure to Return Visitor's Permit		R3 715.00	R4 272.25
Late Renewal of Expired Airside Vehicle Permit		R3 583.80	R4 121.37

PERMIT REPRINT / RE-ISSUE			
PERMIT TYPE		PRICE EXCL.VAT	PRICE INCL.VAT @15%
Personal Permit Reprint		R230.00	R264.50
To add icons and colour		R232.76	R267.67
Icon		R44.00	R50.60

COURSE			
COURSE TYPE			PRICE INCL.VAT @15%
AIT Refresher			R862.50
AVOP Refresher			R862.50
AIT Initial			R1 207.50
AVOP Initial			R1 207.50
AVOP Practical			R862.50
AVSEC			R862.50

A1.2.8 WORKMANSHIP

A1.2.8.1 Process quality control

Clause A1.2.8.1 will be applicable to all scope of works which includes civil, electrical and mechanical for the completion of the entire project.

Add the following new subclauses:

The Contractor shall submit a proposed Quality Management Plan in accordance with ISO 9002 for this contract (Form C9). Confirmation of the Quality Management Plan shall be submitted to the Engineer, for his approval within two weeks of the commencement date and prior to the commencement of construction activities. Once accepted by the Engineer the Contractor shall not deviate from it unless written notification of proposed changes have similarly been submitted and approved. The system shall record the lines and levels of responsibility and indicate the method and frequency by which testing procedures will be conducted.

The Contractor shall also appoint a Quality Manager who shall ensure that the Contractor's staff comply with the requirements of the Quality Management Plan.

Payment for work done will not be made until the results of the Contractor's process control testing have been submitted and the Engineer has approved the work. The Engineer shall conduct such tests as he may deem necessary to verify the process control test results and shall retain all rights as determined in the General Conditions of Contract related to bad workmanship or unacceptable materials. This shall also be applicable to accepted alternative (mix) designs and related specifications.

Insert the following new subclauses:

(a) External testing house

An external testing house will be appointed by the Engineer to undertake verification quality control testing of construction materials and workmanship by means of laboratory testing at an external testing facility to confirm results of the Independent Site Laboratory on a selected sampling basis. All sampling and testing by the external testing house will be done on the instruction of the Engineer. Materials will be sampled on site or at commercial supply sources or at the contractor's asphalt or concrete plant and will be tested the following day. Results will be reported to the Engineer for interpretation and possible action. The external testing house will invoice the Contractor (nominated subcontractor) for the cost of material sampling and testing and for reporting the test results to the Engineer. This cost will be reimbursed under the provisional sum item on approval of the Engineer.

The Contractor will be required to accommodate and support the sampling procedures of the external testing house during the course of the contract. Representatives of the Engineer and the testing house will be allowed to inspect any stockpile, storage facility or processing activity for the purpose of quality control.

(b) External testing house used as independent site laboratory

The contract will utilize an external testing house as an independent site laboratory. Testing shall be undertaken by a combined external testing house laboratory facility for process control (where the process control testing can be utilised as acceptance control), acceptance control and correlation testing subject to the following requirements laid down by the Employer:

- (i) The Contractor accepts the test results of the combined laboratory. Should there be any doubts with regard to certain test results, this will be settled by an independent laboratory mutually agreed upon. The cost in such cases will be to the account of the party at fault.
- (ii) The contractor accepts that the Engineer will be in charge of the combined laboratory.
- (iii) The external testing house must supply a suitable qualified material technician (with at least 10 years asphalt paving quality control experience). The material technician will be responsible for paving quality control (that includes but not limited to temperature control of asphalt, recording of compaction effort, recording of stoppage and prevention of cold joints, inspection of the surface prior to tacking). This material technician must be approved by the Engineer before commencement of any works.
- (iv) The Contractor must install suitable infrared sensors on the paver to record the material temperature on a continuous basis and these results must be available to the external laboratory and Engineer.

C1.2 GENERAL REQUIREMENTS AND PROVISIONS

PART C: MEASUREMENT AND PAYMENT

Item	Unit
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C1.2.1 Environmental Management

PSC1.2.1.1 Monitoring of compliance with and reporting on the EMP.....Month

In addition to the standard pay item the tendered rate shall include all monitoring as per the ACSA Environmental Specification, Specific Environmental Management Plans and Volume 5 Manual of Procedures for Working Airside.

PSC1.2.1.2 Dedicated environmental officerMonth

Add the following:

Pay items PSC1.2.1.1 and PSC1.2.1.2 shall be applicable to all scope of works which include civil, electrical and mechanical for the completion of the entire project.

The Contractor is to provide a full time Environmental Officer to ensure Environmental Compliance. The Environmental officer shall have a relevant Bachelor's degree in Environmental Management or in Geography or in Environmental Sciences.

Item	Unit
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PSC1.2.2 Programming and Reporting

PSC1.2.2.3 Submission of a Scheme 2 Initial Programme	Lump Sum
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PSC1.2.2.4 Submission of a Scheme 2 Initial Programme	Lump Sum
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PSC1.2.2.5 Reviewing and updating a Scheme 2 Programme every month	Month
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PSC1.2.2.6 Preparation and submission of all information and reports specified in the Contract Documentation	Month
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Add the following

The above pay items for PSC1.2.2 and relevant sub-clauses shall be applicable to all scope of works which include civil, electrical and mechanical for the completion of the entire project.

Item	Unit
------	------

C1.2.5 Safety

Add the following:

PSC1.2.5.1 Health and safety plan.....Lump Sum

Add the following to the pay item:

Pay item PSC1.2.5.1 shall be applicable to all scope of works which includes civil, electrical and mechanical for the completion of the entire project.

The tendered rate shall include full compensation for the preparation, submission and approval of the safety plan/file before any works can commence. The safety plan/file shall be submitted to ACSA and the Engineer for review and approval.

PSC1.2.5.2 Implementation of health and safety plan.....Month

Pay item PSC1.2.5.2 shall be applicable to all scope of works which includes civil, electrical and mechanical for the completion of the entire project.

In addition to the standard pay item the tendered rate shall include all implementation of all health and safety requires as per the ACSA Health and Safety Specification, Project Specific Health and Safety requirements and Volume 5 Manual of Procedures For Working Airside.

PSC1.2.5.3 Provision for a full time Construction Safety Officer.....Month

Pay item PSC1.2.5.3 shall be applicable to all scope of works which includes civil, electrical and mechanical for the completion of the entire project.

The tendered sum shall include for the cost of a SACPCMP accredited construction safety officer on a full-time basis, his overheads, transport and all others items necessary for the proper carrying out of his duties.

Add the following pay item:

Item	Unit
------	------

PSC1.2.10 Community Participation

Add the following pay subitems:

(a) Cost for community Participation (PLC and CLO)Month

Pay item PSC1.2.10 shall be applicable to all scope of works which includes civil, electrical and mechanical for the completion of the entire project.

The unit of measurement shall be month for the provision of a PLC and CLO for the project. The tendered rate shall include for all month expenses including salaries for the PLC Committee and the CLO employed for the duration of the project.

Add the following pay item:

Item	Unit
------	------

PSC 1.2.11 (a) Provision for Aviation Specialist.....PC Sum

PSC 1.2.11 (b) Handling costs and profit in respect of sub-item

PSC 1.2.11 (a) above..... %

Expenditure under this item shall be made in accordance with clause 6.6 of the General Conditions of Contract 2015.

Pay item PSC1.2.11 (a) and PSC1.2.11 (b) shall be applicable to all scope of works which includes civil, electrical and mechanical for the completion of the entire project.

The tendered percentage is a percentage of the amount of expenditure approved by the Employer's Agent under sub-item PSC 1.2.11 (a) and shall include full compensation for the handling costs of the Contractor and the profit in connection with the provision of an Aviation Specialist.

Specific reference is made to Clause C1.1.3.11 Procurement of sub-services and omitted rates (Second tier procurement) for the procurement process for the above sub-item.

Add the following pay item:

Item	Unit
PSC 1.2.12 (a) Provision for Rehabilitation of sensitive areas	PC Sum
PSC 1.2.12 (b) Handling costs and profit in respect of sub-item	
PSC 1.2.12 (a) above.....	%

Expenditure under this item shall be made in accordance with clause 6.6 of the General Conditions of Contract 2015.

The tendered percentage is a percentage of the amount of expenditure approved by the Employer's Agent under sub-item PSC 1.2.12 (a), and shall include full compensation for the handling costs of the Contractor and the profit in connection with the rehabilitation of sensitive areas as instructed by the Engineer and Environmental Compliance Officer.

Specific reference is made to Clause C1.1.3.11 Procurement of sub-services and omitted rates (Second tier procurement) for the procurement process for the above sub-item.

Add the following pay item:

PSC1.2.13 Airside induction courses and permits - To include all permits (personal, vehicle and plant), inductions, airside training, parking cards and required works permits.	Lump Sum
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Pay item PSC 1.2.13 shall be applicable to all scope of works which include civil, electrical and mechanical for the completion of the entire project.

The tendered lump sum shall represent full compensation for all costs incurred for the attendance of the safety induction course for all the Contractors personnel including subcontractors and for all costs associated with the provision of all necessary permits as required by ACSA for the completion of the project.

No additional payment except that tendered in this item will be granted for permits, airside courses, radio license courses or for any vehicle license courses or permits associated with the due completion of this project and includes for any costs incurred for these during the maintenance period.

The tendered lump sum shall also include all induction courses and permits for all subcontractors used for the works.

Payment of the lump sum tendered will be made in two instalments:

- (1) The first instalment, 70% of the lump sum, will be made in the first payment certificate after the Contractor has made a substantial start with construction in accordance with the approved programme.

- (2) The second instalment, 30% of the lump sum, will be paid when the value of the work reaches one half of the tendered amount, excluding contingencies and price adjustments.”

Add the following pay item:

PSC1.2.14 Control of Dust and FOD pollution on the runways, taxiways, taxilanes, services roads, aprons, haul and site access road and campsites/site office.....Month

Pay item PSC1.2.14 shall be applicable to all scope of works which include civil, electrical and mechanical for the completion of the entire project.

The unit of measure for the item shall be month. The monthly rate shall include full compensation for all precautions taken, methods used, and costs incurred by the Contractor in order to control dust and pollution to a level that is acceptable to the airport authorities. The monthly rate shall include full compensation for all precautions taken, methods used, and costs incurred by the Contractor in order to control dust during construction operations and Foreign Object Debris (FOD) pollution on a day to day basis to a level that is acceptable to the airport authorities. Precautions may include the regular watering of haul roads and taxiway strip areas, the enforcement of speed limits, the installation of pollution prevention systems at batching plants or other construction equipment, and the regular cleaning of the works, including the Contractor's campsite, of all construction waste or other litter. Special precaution must be taken to ensure that all FOD e.g. loose stones from milling and paving and any other litter around the site is cleaned and removed off-site before the day or nights work is complete.

Add the following pay item:

PSC1.2.15 Security requirements at the Contractors Gate and Camp site.... Month

Pay item PSC1.2.15 shall be applicable to all scope of works which include civil, electrical and mechanical for the completion of the entire project.

The unit of measure for the item shall be month. The tendered rates shall include full compensation for all security requirements at the Contractors gates and camp site. The Contractor is required to ensure that ACSA security policies and measures are upheld throughout the duration of the contract. Specific reference is made to Volume 5 Manual of Procedures for Working Airside.

Only ACSA approved security companies can be appointed under this pay item. The Contractor shall ensure that the Security Company appointed meets all ACSA requirements.

The specific requirement for the security is listed below but not limited to:

- The contractor may only procure the services of ACSA approved security companies.
- Specialised screening equipment will be required at the Contractor's gate for screening. The following equipment will be required:
 - Arch metal detectors – Enhanced walk-through multi-zone metal detector. Capability to detect the full range of metal weapon threats even within body cavities. 60 pinpointing zones with high resolution & precision: 20 Vertical & 3 Lateral or similar approved.
 - Xray Machine Scanner

- Tunnel Dimension – 620 (W) x 460 (H) (mm)
- Conveyor speed – approx.. 0.2/0.24 (m/s)
- Frequency – 50Hz/60Hz
- Max conveyor load – 160 kg
- Resolution – standard 40AWG
- Penetration (steel) – standard 35mm
- ASTM 792-08 (Test 1, Test 3, Test 4) - Test 1: AWG 40 5) / Test 3: 1 mm horz./vert. 5) / Test 4: 34 mm 5)
- X-ray dose (typical) - HI-MAT: 1.6 µSv (0,16 mrem)
- Handheld detectors
- Park home with ablutions facilities
- The following personnel will be required:
 - Seven Officers
 - Manager
 - 1 x Supervisor
- Camp site security fencing - Bekaert Bastion or similar approved 3-5-10, single skin 3mm Bezinal coated mesh with stainless steel bolts and fixings, hot dip galvanized posts, six strands of Aluzinc barbed wire and 730mm Bezinal
- Removal of existing airside fence and installation of security gate and automated boom control.

Add the following pay item:

PSC1.2.16 As-built SurveyLump Sum

Pay item PSC1.2.16 shall be applicable to all scope of works which include civil, electrical and mechanical for the completion of the entire project.

The tendered lump sum shall represent full compensation for all costs incurred for the preparation of all as-built surveys for the works.

Payment of the lump sum tendered will be made in two instalments:

- (1) The first instalment, 70% of the lump sum, will be made when all as-built data and surveys are submitted to the engineer.
- (2) The second instalment, 30% of the lump sum, will be paid when all as-built data is verified and approved by the engineer.

Add the following pay item:

PSC1.2.17 Material As-BuiltLump Sum

Pay item PSC1.2.17 shall be applicable to all scope of works which include civil, electrical and mechanical for the completion of the entire project.

The tendered lump sum shall represent full compensation for all costs incurred for the preparation of all material as-built for the works.

Payment of the lump sum tendered will be made in two instalments:

- (1) The first instalment, 70% of the lump sum, will be made when all material as-built data and surveys are submitted to the engineer.
- (2) The second instalment, 30% of the lump sum, will be paid when all material as-built data is verified and approved by the engineer.

Add the following pay item:

PSC1.2.18 Management and Implementation of CPG RequirementsMonth

Pay item PSC1.2.18 shall be applicable to all scope of works which include civil, electrical and mechanical for the completion of the entire project.

Tendered rate should be for full compensation for all costs to be incurred for complying to the requirements and specifications of the CPG requirements as per the tender and ASCA Specifications.

Payment will be made monthly subject to proof of full compliance to the requirements and specifications that needs to be provided including all monthly reporting.

Add the following pay item:

PSC1.2.19 Provision for CIDB B.U.I.L.D. ProgramMonth

Pay item PSC1.2.19 shall be applicable to all scope of works which include civil, electrical and mechanical for the completion of the entire project.

Tendered rate should be for full compensation for all costs to be incurred for complying to the requirements and specifications of the CIDB B.U.I.L.D. programme. In this project, only the standard for Developing Skills through Infrastructure Contracts will be applicable, wherein the Contractor will be provided with a minimum contract skills development goal (0.25% of the construction value for CE works) that the Contractor should meet by the end of the contract. This amount will be allocated for skills development to be achieved in the performance of a contract in relation to the provision of different types of workplace opportunities, linked to work associated with a contract culminating in or leading to:

- a. A part or full occupational qualification registered on the national qualification framework,
- b. A trade qualification leading to a listed trade,
- c. A national diploma registered on the National Qualification Framework and /or,
- d. Registration in a professional category by one of the professional bodies.

Payment will be made monthly subject to proof of full compliance to the requirements and specifications that needs to be provided in a monthly progress report.

Add the following pay item:

PSC1.2.20 Penalty to be deducted for non-compliances with requirements for accommodation of traffic as per COTO Section 1.5, ACSA Specific Regulations and Volume 5 Manual of Procedures for Working Airside

(a) Fixed penalty per occurrence(No)

(b) Time related penalty(hour)

Pay item PSC1.2.20 shall be applicable to all scope of works which include civil, electrical and mechanical for the completion of the entire project.

The allowed penalty for item PSC1.2.21 (a) shall be measured in number. The penalty will be imposed for non-compliances to accommodation of traffic as per COTO Section 1.5, ACSA Specific Regulations and Volume 5 Manual of Procedures for Working Airside. The penalty shall be imposed each time that the non-compliance occurs. The penalty will be issued either by the ACSA Health and Safety Representative, Engineer or the Airport Authorities.

The allowed penalty for item PSC1.2.21 (b) shall be measured in hour for any non-compliance for accommodation of traffic as per COTO Section 1.5, ACSA Specific Regulations and Volume 5 Manual of Procedures for Working Airside. The penalty will be imposed every hour that the non-compliance continues without rectification from the Contractor.

All penalties issued will be deducted on a monthly basis in the interim payment certificates.

Add the following pay item:

PSC1.2.21 Penalty to be deducted for non-compliances with Environmental Specification, ACSA Specific Regulations and Volume 5 Manual of Procedures for Working Airside per Occurrence

(a) Fixed penalty per occurrence(No)

Pay item PSC1.2.21 shall be applicable to all scope of works which include civil, electrical and mechanical for the completion of the entire project.

The allowed penalty for item PSC1.2.22 (a) shall be measured in number. The penalty will be imposed for non-compliances with Environmental Specification, ACSA Specific Regulations and Volume 5 Manual of Procedures for Working Airside per Occurrence. The penalty shall be imposed each time that the non-compliance occurs. The penalty will be issued either by the ACSA Environmental Representative, Engineer or the Airport Authorities.

All penalties issued will be deducted on a monthly basis in the interim payment certificates.

Add the following pay item:

PSC1.2.22 Penalty to be deducted for non-compliances with OHS-Act, Construction Regulations, ACSA Specific Regulations and Volume 5 Manual of Procedures for Working Airside per Occurrence

(a) Fixed penalty per occurrence(No)

Pay item PSC1.2.22 shall be applicable to all scope of works which include civil, electrical and mechanical for the completion of the entire project.

The allowed penalty for item PSC1.2.23 (a) shall be measured in number. The penalty will be imposed for non-compliances with OHS-Act, Construction Regulations, ACSA Specific Regulations and Volume 5 Manual of Procedures for Working Airside per Occurrence. The penalty shall be imposed each time that the non-compliance occurs. The penalty will be issued either by the ACSA Health and Safety Representative, Engineer or the Airport Authorities.

All penalties issued will be deducted on a monthly basis in the interim payment certificates.

Add the following pay item:

PSC1.2.23 Penalty to be deducted for non-compliances with Volume 5 Manual Of Procedures For Working Airside per Occurrence

(a) Fixed penalty per occurrence(No)

Pay item PSC1.2.23 shall be applicable to all scope of works which include civil, electrical and mechanical for the completion of the entire project.

The allowed penalty for item PSC1.2.24 (a) shall be measured in number. The penalty will be imposed for non-compliances with Volume 5 Manual Of Procedures For Working Airside per Occurrence. The penalty shall be imposed each time that the non-compliance occurs. The penalty will be issued either by the ACSA Representatives, Engineer or the Airport Authorities.

All penalties issued will be deducted on a monthly basis in the interim payment certificates.

Add the following pay item:

PSC1.2.24 (a) Provision for Independent Health and Safety (OHS) and Environmental Management (ENV)Prov Sum

PSC1.2.24 (b) Handling costs and profit in respect of sub-item PSC 1.2.24 (a) Above (Capped at 7.5%)%

Expenditure under this item shall be made in accordance with clause 6.6 of the General Conditions of Contract 2015.

The tendered percentage is a percentage of the amount of expenditure approved by the Employer's Agent under sub-item PSC 1.2.24 (a) and shall include full compensation for the handling costs of the Contractor and the profit in connection with the provision for Independent Health and Safety (OHS) and Environmental Management (ENV).

SECTION 1.3: CONTRACTOR’S SITE ESTABLISHMENT AND GENERAL OBLIGATIONS

PART A: SPECIFICATIONS

A1.3.3 GENERAL

A1.3.3.1 Construction camps

Add the following to the first paragraph:

The site for the contractor’s office and stores as well as the engineer’s office and laboratory will be within ACSA’s premises (Landside) and is indicated in the Site Layout Plan Drawing (Volume 4). The contractor shall provide 24-hr security at the camp site as well as a dedicated smoking area under roof as required in terms of legislation. The cost of this will be deemed to be included in item C1.3.1.

Camp site security fencing - Bekaert Bastion or similar approved 3-5-10, single skin 3mm Bezinal coated mesh with stainless steel bolts and fixings, hot dip galvanized posts, six strands of Aluzinc barbed wire and 730mm Bezinal. The cost off the fencing shall be included in item PSC1.2.16 Security requirements at the Contractors Gate and Camp site.

All specific establishment cost and adhering to ACSA specific requirements and requirements from Volume 5 Manual of Procedures for Working Airside shall be deemed to be included in Item C1.3.1.

Add the following new subclause:

A1.3.3.5 Contractor’s ablution facilities

The Contractor shall provide sufficient portable chemical latrine units at the work sites as required by legislation i.e. 1:30 employees and catering for males and females. The latrine units shall be serviced daily and kept in a hygienic and orderly state to the approval of the Engineer. No separate payment shall be made for this requirement, and the costs thereof shall be deemed to be included in the rates tendered for the Contractor’s time-related obligations.

C1.3 CONTRACTOR’S SITE ESTABLISHMENT AND GENERAL OBLIGATIONS

PART C: MEASUREMENT AND PAYMENT

Item Unit

C1.3.1 The Contractor's general obligations

Add the following pay subitems:

- PSC1.3.1.4 Suspension Cost
- a) De-establishmentNumber
 - b) Re-establishment Number
 - c) Suspension period month
 - d) Engineer’s costprime cost sum (PC) sum

Under the heading “Item C1.3.1.3”, delete the 2nd paragraph and replace with the following:

Pay item PSC1.3.1.4 shall be applicable to all scope of works which include civil, electrical and mechanical for the completion of the entire project.

The contract rate shall include full compensation for that part of the Contractor’s general obligations which are mainly a function of construction time. The contract rate shall be deemed to include, leasing costs, hire costs or cost of ownership per month for Contractor’s

Equipment. The contract rate will be paid monthly, pro rata for parts of a month, from the Commencement Date in terms of the Contract Documentation until the end of the Mobilisation Period for item C1.3.1.3(a). For item C1.3.1.3(b) the contract rate will be paid monthly, pro rata for parts of a month, from the end of Mobilisation Period until the end of the original Contract Period specified for completion of the Works.

Add the following new paragraphs:

Item C1.3.1.4

The rates tendered under subitem C1.3.1.4 shall represent full compensation for all Costs for Suspension of Work and all Costs during Suspension of Works period, and no other Costs (including other monthly costs) shall be payable.

Payment of subitems C1.3.1.4(a) and C1.3.1.4(b) shall be made for the number of de-establishments and re-establishments of all Personnel and Goods (Contractor's Equipment, Materials, Plant and Temporary Works) as instructed by the Engineer. Payment of subitems C1.3.1.4(a) and C1.3.1.4(b) shall not apply during the Mobilisation Period.

Payment of subitem C1.3.1.4(c) shall be made monthly, pro rata for parts of a month, from the date on which the Contractor has suspended progress of all of the Works in terms of Conditions of Contract clause 8.8 and commenced with de-establishment of the site, until permission or instruction to proceed in terms of Conditions of Contract clause 8.12 is given. Payment of subitem C1.3.1.4(c) shall not apply during the Mobilisation Period.

The Prime Cost Sum in subitem C1.3.1.4(d) is provided to cover the cost of the Engineer during the period of suspension of the works. The amounts certified by the Employer shall be made to the Engineer, within 30 days of it being certified by the Employer."

Item	Unit
C1.3.1 Contractor's general obligations.....	

Insert the following paragraph after the fourth paragraph:

Should the combined total tendered for subitems C1.3.1.1 and C1.3.1.3 exceed 15% of the tender sum, the tenderer shall state his reasons in writing for tendering in this manner.

If the tenderer should require additional compensation for his obligations under section C1.3 (over and above the total tendered for item C1.3.1 by including such additional compensation in the tendered rates and/or lump sum of item s in the schedule of quantities, these items and the value of such additional compensation shall also be indicated in writing in a letter.

Add the following:

The tendered rate per month for Item C1.3.1.3 represents full compensation for that part of the contractor's general obligations, which are mainly a function of construction time. The tendered sum will be paid monthly, pro rata for parts of a month, from the Commencement Date until the end of the period for completion of the works, plus any extension thereof as provided in the general conditions of contract, provided that".

Add the following at the end of this pay item:

The amount payable to the contractor for time related costs arising from extensions of time granted by the employer, where the contractor is fairly entitled to such compensation in terms of the General Conditions of Contract, shall be calculated as follows:

- (i) Account shall be taken of all time related items scheduled in C1.3 Part C: Item C1.3.1

- (ii) All pay items for which the unit of measurement is "month" shall be deemed to be based on a 23-day working month."

Add the following to this pay item:

The rate will include for the cost of all Escort requirements as specified in A1.3.

SECTION 1.4: FACILITIES FOR THE ENGINEER

PART A: SPECIFICATIONS

THE FOLLOWING CHAPTER WILL BE APPLICABLE TO ALL SCOPE OF WORKS WHICH INCLUDE CIVIL, ELECTRICAL AND MECHANICAL FOR THE COMPLETION OF THE ENTIRE PROJECT.

A1.4.7 EXECUTION OF THE WORKS

A1.4.7.1 Offices and laboratories

a) General

Add the following:

The Resident Engineer's offices shall, amongst other things, have one room at least 9 x 3.5 metres to serve as a conference room. All offices and laboratories shall be supplied with approved burglar proofing.

c) Laboratories

Add the following:

For the purposes of this Contract, commercial laboratory testing shall be used for acceptance control purposes.

A1.4.7.3 Services

The following subclause shall be added to clause A1.4.7.3 of the Specifications:

(c) First Aid

The Contractor shall provide a first aid kit at the site offices. No separate payment will be made and the Contractor shall allow for this in his tendered rates for accommodation for supervisory staff.

C1.4 FACILITIES FOR THE ENGINEER

PART C: MEASUREMENT AND PAYMENT

Item

Unit

Add the following pay items:

PSC1.4.3.39 ACSA approved lime coloured reflective safety jackets
(With lettering).....Number (No)

PSC1.4.3.40 Rechargeable 500 000 candlelight halogen lamps.....Number (No)

PSC1.4.3.41 Two-way hand held radio VHF/AM Dittel FSG5 complete with charger,
carrying bag with strap and vehicle magnetic antenna including adapter
cable.....Number (No)"

The unit of measurement for items PSC 1.4.3.39, 1.4.3.40 and 1.4.3.41 shall be number. The rates shall include full compensation for the supply of all equipment

required by the engineer as stated in the pay item.

Item	Unit
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Add the following pay items:

PSC1.4.3.42 Supply and install ACSA Approved metres for water and electricity	Number (No)
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The unit of measurement shall be number. The rates shall include full compensation for the supply and installation of ACSA approved water and electricity metres at the site camp.

SECTION 1.5: ACCOMMODATION OF TRAFFIC

PART A: SPECIFICATIONS

THE FOLLOWING CHAPTER WILL BE APPLICABLE TO ALL SCOPE OF WORKS WHICH INCLUDE CIVIL, ELECTRICAL AND MECHANICAL FOR THE COMPLETION OF THE ENTIRE PROJECT.

A1.5.3 GENERAL

A1.5.3.2 General Requirements

Add the following to clause A1.5.3.2:

This Contract is divided into limited occupation areas in order to allow for the airport to be fully operational during construction. All occupation areas will be over a short duration (e.g. for night shift works). The Contractor shall inform and obtain approval from ATNS and AM prior to closing any runway/taxiway for construction. The requirements of Volume 5 and Clause A1.2.7 shall be fully adhered to by the Contractor. The Contractor is also to note that escort services are to be provided by the contractor for vehicles entering the restricted area to areas where work is taking place.

Details of the envisaged Phasing of the work are contained in Volume 4 (Book of Drawings) KSIA-CIV-PP-033 as well as C3.5 of this document. If the Contractor wishes to deviate from these details in any way, the Contractor shall request approval for such deviation and if approved shall keep the Airport Manager (AM) and the Engineer fully informed of changes

Add the following new sub-clauses:

A1.5.3.15 Night work

All plant used on site shall be equipped with suitable lights including flashing amber lights to enable the work to be properly performed and controlled at night. Night work will only commence if, according to the Engineer, the Contractor provides all equipment, personnel and stand-by reserves to execute the work at night as if in normal daytime hours.

Payment shall be made under item PSC1.5.14 for provision of the lighting for the whole working site in work areas as specified above.

The Contractor shall provide for artificial lighting to ensure the proper execution of the work in terms of the contract. The artificial lighting shall be subject to the Engineer's approval and shall consist of at least the following:

- (i) At least 3 mobile floodlight towers per work area shall be provided when works are performed during the night shift. A work area is defined as an area of radius 15 m in which night work is being done. The Contractor shall provide adequate lighting at night as specified for every work area. The light in a work area shall be a minimum as per the table below:

Examples of Tasks	Illumination Level	Average Minimum Maintained Illuminance
All work operations areas; setup of lane or road closures, lane closure tapers, and fagging stations	Level I	75 Lux
Areas on or around construction equipment; asphalt paving, milling, concrete placement/removal and earthworks	Level II	108 Lux
Pavement or structural crack/pothole fling; joint repair, pavement patching/ repairs;	Level III	215 Lux

installation of signal/electrical/mechanical equipment		
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- (iii) The power systems shall comply with the Occupational Health and Safety Act No 6 of 1993 as amended, and the Standard Regulation for Wiring of Premises of the South African Institute of Electrical Engineers.

All night work equipment shall be mobile and be removed at the end of every nights shift.

No additional payment will be made to the Contractor over and above payment for the Contractor's general obligations for providing and maintaining all extra personnel and equipment for executing night work.

Upon request by the Engineer or his representative, the Contractor shall make available a mobile flood light tower for use by the Engineer's staff. Payment for this request shall be made under item C1.5.15.

All night work and methods shall conform to Volume 5 and be approved by the Engineer and the Airport Authority before any works can commence.

PART C: MEASUREMENT AND PAYMENT

All pay items within the COTO and amended pay items below shall be applicable to all scope of works which include civil, electrical and mechanical for the completion of the entire project.

In addition to the Standard Pay Items:

Item	Unit
PSC1.5.1.1 Accommodation of pedestrian and non-motorised traffic.....	Month

In addition to the standard pay item, the tendered rate shall include full compensation for accommodating all ACSA non-motorised traffic and staff. The rate shall include full compliance with Volume 5 Manual of Procedures for Working Airside.

PSC1.5.2 Accommodation of vehicular traffic.....	Month
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In addition to the standard pay item, the tendered rate shall include full compensation for accommodating all Air traffic, airport vehicles and staff. The rate shall include full compliance with Volume 5 Manual of Procedures for Working Airside.

Add the following payment items:

The Contractor's obligation under this Section C1.5 shall not be measured or paid for directly (except as hereinafter provided for) and compensation for the work involved to comply with these obligations shall be deemed to be covered by the rates and amounts tendered for the various items of work included under this contract.

Add the following pay items:

Item	Unit
PSC1.5.13 Safety Barriers:	
(a) Provide HDPE plastic mobile road safety barrier, NJ type (2 m x 1 m high) taped with yellow reflective tape, two strips on either side.....	Number (No)
(b) Placing, moving and final removal of HDPE NJ type barriers upon completion of the works	Lump Sum

- (c) Provide precast concrete temporary barrier, NJ type (2 m x 0.8 m high with 0.6m base) taped with yellow reflective tape, two strips on either side and with two amber flashing lights mounted on each barrier.....Number (No)
- (d) Placing, moving and final removal of concrete barriers upon completion of the apron worksLump Sum
- (e) Provide Taxiway/Runway closure barriers as per drawing no: KSIA-CIV-PP-033.....Number (No)
- (f) Placing, moving and final removal of taxiway/runway closure barriers upon completion of the worksLump Sum
- (g) Provision for temporary construction wooden fencing - Bravo Taxi Way, Greenfield Area, Apron Stand as per detailed drawing KSIA-CIV-SD-032C.....Lump Sum

The Contractor shall be responsible for maintaining the barriers (including ballast of plastic barriers) and lights. Placing and removal of barriers will be measured once only for payment for each barrier. No additional payment will be made for the intermediate moving and placing of barriers during the contract.

Payment of the lump sums tendered will be made in three instalments.

- (1) The first instalment, 30% of the lump sum, will be made after the contractor has made the initial provision and first placement with the first facility closure
- (2) The second instalment, 40% of the lump sum, will be paid when the value of the work reaches one half of the tendered amount, excluding contingencies and price adjustments.
- (3) The third and final instalment, 30% of the lump sum, will be paid when the barriers are no longer needed and have final been removed off-site.”

“Item	Unit
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PC1.5.14 Provision of lighting on site for works areas during night work or where instructed.....	Lump Sum
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The tendered sum shall include compensation for providing and maintaining lighting as specified and shall include for all units, required for all the operations being done during the same working period. The tendered rate shall include for full compliance to Clause A1.5.3.15 night work. The rate shall also include for a detailed methodology to be submitted to the Engineer and Airport Authorities for review and approval before any night works are to commence.

Payment shall be made monthly, pro rata to the contract time elapsed but shall not finally exceed the tendered sum, except when extension of time for completion is granted in terms of the general conditions of contract, when additional payment will be made pro rata to the initial contract period of the main portion of the works.

Payment for the moving and operation of the lighting equipment and other incidentals necessary for lighting the site shall be included in the tendered rates.”

“Item	Unit
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PC1.5.15 Provision of mobile flood light tower for the use by the Engineer’s staff for works areas during night work or where instructed.....	Lump Sum
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The tendered sum shall include compensation for providing and maintaining a mobile flood light tower lighting as specified and shall include for all units, required for all the operations being done during the same working period.

Payment shall be made monthly, pro rata to the contract time elapsed but shall not finally exceed the tendered sum, except when extension of time for completion is granted in terms of the general conditions of contract, when additional payment will be made pro rata to the initial contract period of the main portion of the works.

Payment for the moving and operation of the lighting equipment and other incidentals necessary for lighting the site shall be included in the tendered rates.”

“Item	Unit
PC1.5.16 Provision of escort services for all project vehicles.....	Lump Sum

Payment of the lump sum tendered will be made for the escort services required by ACSA to be provided by the Contractor. The tendered lump sum shall include full compensation for training requirements and Airside Vehicle Operators Permit (AVOP) compliance, providing all transport, safety equipment not otherwise specifically covered, labour and ancillaries required to perform an escort service for all construction vehicles from the security gate to the area where work is taking place.

Payment of the lump sum tendered will be made in three instalments.

- (1) The first instalment, 50% of the lump sum, will be made in the first payment certificate after the contractor has made a substantial start with construction in accordance with the approved programme.
- (2) The second instalment, 35% of the lump sum, will be paid when the value of the work reaches one half of the tendered amount, excluding contingencies and price adjustments
- (3) The third and final instalment, 15% of the lump sum, will be paid when the work has been completed and certificate of practical completion has been issued.

The tendered sum shall include full compensation for training requirements and AVOP compliance, providing all transport, safety equipment not otherwise specifically covered, labour and ancillaries required to perform an escort service for all construction vehicles from the security gate to the area where work is taking place.

The tendered sum shall also include for the full compensation of all radio equipment required to communicative with ATNS and the AM.

SECTION 1.6: CLEARING AND GRUBBING

PART A: SPECIFICATIONS

A1.6.7 EXECUTION OF THE WORKS

A1.6.7.6 Conservation of topsoil

Add the following paragraph to the clause:

“During the improvements of the shoulder areas strips for the runway, materials will be temporarily windrowed outside the work areas. No windrows shall be allowed within 37.5 m of the runway edge within 150m of any threshold. Windrow heights shall also be managed to ensure that they do not exceed ACSA maximum obstacle height requirements.”

SECTION 1.7: LOADING AND HAULING

PART A: SPECIFICATIONS

A1.7.1 SCOPE

A1.7.3.2 Haul and construction access roads

Add the following paragraph to the clause:

The usage and selection of haulage roads on the employer's (ACSA) premises and on the site will be coordinated on a daily basis between the Contractor, the Engineer's Representative and the Employer's representative.

COTO CHAPTER 2: SERVICES

SECTION 2.1: GENERAL REQUIREMENTS AND TRENCHING FOR SERVICES

NOTE TO THE CONTRACTOR: THE FOLLOWING CHAPTER WILL BE APPLICABLE TO ALL SCOPE OF WORKS WHICH INCLUDE CIVIL, ELECTRICAL AND MECHANICAL FOR THE COMPLETION OF THE ENTIRE PROJECT.

PART A: SPECIFICATIONS

A2.1.3 GENERAL

Add the following to the clause:

The owners of services affected under this Contract are all under the control of the Airports Company South Africa whose representative must be contacted regarding the location of all services in the construction area. Inspections shall be undertaken by means of the authority's service detectors and such inspections shall be attended by the Contractor and the Engineer's Representative. No payment shall be made to the Contractor for attending these inspections.

The following existing surface and subsurface services are not known and exact locations should be determined with service detection and inspection.

Service	Approximate Location
Runway and taxiway edge lights	Lights and cables run parallel with the runway and taxiways
Taxiway centreline lights	Cables are located within pavement
Apron high mast lights	Cables located within apron in trenches
Storm water pipes	As indicated on layout drawings
Fuel Lines	As indicated on layout drawings
Electrical	As indicated on layout drawings
Fibre Optic /Data Cables	To be confirmed with KSIA prior to commencement of works

Protection and/or relocation of certain services will be required. The Engineer will issue instructions after location and exposure of these services. No large compaction equipment will be allowed to work within 10 m of any ground mounted frangible light fixtures or any other navigational equipment without approval by the Engineer. The contractor shall allow for a 1,5 ton sit-on roller or similar compaction equipment approved by the Engineer to work within 10 m of the navigational equipment. No additional payment will be made for work close to the equipment as specified above."

The Contractor shall also be liable for any loss or consequential loss suffered by the owner of a service which is damaged by the contractor's operations, e.g. loss of the ILS or Runway lighting due to a power failure.

This work is planned to be executed in close proximity of approach, edge lights and runway closure crosses and must be executed without interfering with the operation of these lights. The contractor shall ensure that the position of the cables are known to himself and his personnel and shall take all reasonable care to avoid damage to the cables, lights or transformers. Protective covers and markers shall be used as required to protect the lights from being damaged or covered by products (e.g. bituminous) whilst the work is carried out. No additional payment will be made to protect the lights.

Should existing services be damaged, the contractor shall give adequate notice to all concerned and leave enough time after completing a particular work shift to allow for the reinstatement of the cables before opening the runway to air traffic.

Where applicable, existing edge lighting and electrical systems for the runway and taxiways need to be kept operational during the course of the project. A number of these lights will need to be raised to match the new level of the surfacing.

PART C: MEASUREMENT AND PAYMENT

Add the following payment items:

Item	Unit
------	------

PSC2.1.28 (a) Hydro Jetting of service pipe lines and clearing siltation.....	PC Sum
--	---------------

PSC2.1.28 (b) Handling costs and profit in respect of sub-item	
PSC2.1.28 (a)above.....	%

Expenditure under this item shall be made in accordance with clause 6.6 of the General Conditions of Contract 2015.

The tendered percentage is a percentage of the amount of expenditure approved by the Employer's Agent under sub-item PSC 1.2.12 (a), and shall include full compensation for the handling costs of the Contractor and the profit in connection with hydro jetting of existing service pipe lines and clearing siltation a instructed by the Engineer. All ACSA permits and security requirements shall be paid for under pay item PSC1.2.16.

Add the following payment items:

Item	Unit
------	------

PSC2.1.29 Mandrel testing of all electrical sleeves as directed by the Engineer including flushing of the sleeves as required.....	m
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The tendered rate shall be metre of mandrel testing conducted including flushing and clearing of siltation of all existing electrical sleeves as directed by the Engineer. The tendered rate shall include full compensation for all equipment, plant, material and labour to conduct the mandrel test. The tendered rate shall also include for a detailed report to be submitted to the engineer with the results of the mandrel testing conducted. The Contractor shall supply a detailed methodology for the process of the mandrel testing to the Engineer for approval before work can commence. All ACSA permits and security requirements shall be paid for under pay item PSC1.2.16.

Add the following payment items:

Item	Unit
------	------

PSC2.3.31.3 Decommissioning of existing pipeline section	
---	--

(a) Bentonite-cement grouting of existing pipeline.....	m
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The tendered rate shall be metre of bentonite-cement grout pumped into the existing fuel pipe line which requires decommissioning. The tendered rate shall include full compensation for all plant, material, equipment, labour and profit for the bentonite-cement grouting of the existing fuel pipe lines.

Add the following payment items:

Item	Unit
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PSC2.3.32 Demolition Of Pipework And Ancillaries - Refer to Mechanical Layouts for Demolitions information and specifications.

PSC2.3.32.1 Demolition of Piping and Equipment (Night Works)

- | | |
|--|----------|
| (a) Draining and purging of Existing Pipeline : VC6 to VC7, including all fittings (Ø16", 600m)..... | Lump Sum |
| (b) Cut pipe at 50m intervals or less to facilitate Bentonite-cement grouting of Existing Pipeline : Tie-in point #1 to Tie-in point #2..... | No |
| (c) Removal of 16" Pipe incl. labour, materials, etc. required to cold-cut and lift out piping, transport and delivery to the Employer's storage premises..... | m |
| (d)(i) Demolition of Existing LP 7..... | Lump Sum |
| (d)(ii) Demolition of Existing HP 6 | Lump Sum |
| (d)(iii) Demolition of Partially Constructed HP 6 | Lump Sum |
| (d)(iv) Demolition of VC13..... | Lump Sum |

Demolition of Piping and Equipment (Night Works)

All of the works covered in this section are to be carried out as night works (22:00 to 04:00). Rates are to include all additional costs, including but not limited to, lighting costs, power supply/generators etc.

Draining and purging of Existing Pipeline

Payment for Draining and Purging of the Existing Main Fuel Pipeline will be made on the basis of the tendered rates. No additional costs for nightworks/overtime will be accommodated.

Decommissioning of Existing Pipeline Section

The tendered rate shall include all materials, plant and labour costs for cold cutting of the line to assist with bentonite-cement grouting.. Payment will be made on the basis of the tendered rates. No additional costs for nightworks/overtime will be accommodated.

Removal of 16" Pipe

The tendered rate shall include all materials and labour costs required to cold cut and lift out piping, including transport and delivery to the Employer's storage premises. Payment will be made on the basis of the tendered rates. No additional costs for nightworks/overtime will be accommodated.

Demolition of Stations

The tendered rate shall include all materials, plant and labour costs for the removal of the existing stations, including:

- Cold cutting of existing pipeline.

- Lifting out of existing valve assembly, transport and delivery to the Employer's storage premises.

The following stations are to be demolished:

- Existing LP7
- Existing HP6
- Partially Constructed HP6
- VC13

Payment will be made on the basis of the tendered rates. No additional costs for nightworks/overtime will be accommodated.

The tender rated for PSC2.3.32.1 (a) & (d)- (i), (ii), (iii), (iv) shall be Lump Sum. The rates shall include for all additional costs including, but not limited to, lighting costs, power supply/generators etc. The rate shall include for all materials, plant and labour costs for the removal of piping and equipment at existing stations i.e. cold-cutting of existing pipeline, lifting out of existing valve assemblies and associated piping, transport and delivery to the Employer's storage premises.

The tendered rate for PSC2.3.32.1 (b) shall be number of cut pipes at 50m intervals or less. The rates shall include for all additional costs including, but not limited to, lighting costs, power supply/generators etc. The rate shall include for all materials, plant and labour costs for the removal of piping and equipment at existing stations i.e. cold-cutting of existing pipeline, lifting out of existing valve assemblies and associated piping, transport and delivery to the Employer's storage premises.

The tendered rate for PSC2.3.32.1 (c) shall be metre of 16 inch pipe removed. The rates shall include for all additional costs including, but not limited to, lighting costs, power supply/generators etc. The rate shall include for all materials, plant and labour costs for the removal of piping and equipment at existing stations i.e. cold-cutting of existing pipeline, lifting out of existing valve assemblies and associated piping, transport and delivery to the Employer's storage premises.

PSC2.3.32.2 Demolition of Pipeline and Equipment (Normal Hours)

(i) Demolition of Stations

Demolition of Existing LP 11.....	Lump Sum
Demolition of Existing Pit Valve 1	Lump Sum
Demolition of Existing Pit Valve 2	Lump Sum
Demolition of Existing Pit Valve 3	Lump Sum
Demolition of Existing Pit Valve 4	Lump Sum
Demolition of Existing Pit Valve 5	Lump Sum
Demolition of Existing Pit Valve 6	Lump Sum
Demolition of Existing Pit Valve 7	Lump Sum
Demolition of Existing Pit Valve 8	Lump Sum

(ii) Removal of 16" Pipe sections incl. labour, materials, etc. required

to cold-cut and lift out piping, transport and delivery to the Employer's storage premises.....m

Demolition of Piping and Equipment (Normal Working Hours)

All of the works covered in this section are to be carried out during normal working hours. Payment will be made on the basis of the tendered rates. Rate to include all materials, plant and labour costs for the removal of piping and equipment at existing stations i.e. cold-cutting of existing pipeline, lifting out of existing valve assemblies and associated piping, transport and delivery to the Employer's storage premises.

Demolition of Stations

The tendered rate shall include all materials, plant and labour costs for the removal of the existing stations, including:

- Cold cutting of existing pipeline.
- Lifting out of existing valve assembly, transport and delivery to the Employer's storage premises.

The following stations are to be demolished:

- Existing LP11
- All pit valves

Removal of 16" Pipe

The tendered rate shall include all materials and labour costs required to cold cut and lift out piping, including transport and delivery to the Employer's storage premises.

The tendered rate for PSC2.3.32.2 (i) Demolition of Stations shall be lump sum. The rate shall include for all materials, plant and labour costs for the removal of piping and equipment at existing stations i.e. cold-cutting of existing pipeline, lifting out of existing valve assemblies and associated piping, transport and delivery to the Employer's storage premises.

The tendered rate for PSC2.3.32.2 (ii) shall be metre of 16 inch pipe removed. The rate shall include for all materials, plant and labour costs for the removal of piping and equipment at existing stations i.e. cold-cutting of existing pipeline, lifting out of existing valve assemblies and associated piping, transport and delivery to the Employer's storage premises.

COTO CHAPTER 2: SERVICES

SECTION 2.2: DRY SERVICES

NOTE TO THE CONTRACTOR: THE FOLLOWING CHAPTER WILL BE APPLICABLE TO ALL SCOPE OF WORKS WHICH INCLUDE CIVIL, ELECTRICAL AND MECHANICAL FOR THE COMPLETION OF THE ENTIRE PROJECT.

PART C: MEASUREMENT AND PAYMENT

Add the following new payment item.

Item	Unit
PSC2.2.10 Rasing and lowering existing electrical airport manholes – drawing reference KSIA-CIV-SD-032A.....	No

The unit of measure shall be number of existing electrical manholes raised or lowered.

The tendered rate shall provide full compensation for all plant, material, transportation, labour and profits for the raising and lowering of existing electrical airport manholes.

Item	Unit
PSC2.2.11 Coring into existing concrete/masonry manholes	No

The unit of measure shall be number of 110mm or 32mm holes cored in existing manholes.

The tendered rate shall provide full compensation for all plant, material, transportation, labour and profits for the coring of cores into existing manholes and sealing/waterproofing sleeves.

Item	Unit
PSC2.2.12 Waterproofing of Chambers, outlet structures, skewed ends, catchpits, manholes, thrust and anchor blocks as per detailing drawing KSIA-MECH-GA-008	m²

The unit of measure shall square metres of chambers waterproofed as per detail drawing KSIA-MECH-GA-008.

The tendered rate shall provide full compensation for all plant, material, transportation, labour and profits for the waterproofing of chambers as per detail drawing KSIA-MECH-GA-008.

Item	Unit
PSC2.2.13 Supply and install stainless steel gratings as per detail drawing KSIA-MECH-GA-008.....	m

The unit of measure shall metre of stainless steel gratings supplied and installed as per detail drawing KSIA-MECH-GA-008.

The tendered rate shall provide full compensation for all plant, material, transportation, labour and profits for the stainless-steel gratings supplied and installed as per detail drawing KSIA-MECH-GA-008.

COTO CHAPTER 3: DRAINAGE
SECTION C3.2 CULVERTS

PART C: MEASUREMENT AND PAYMENT

Add the following new payment item.

Item	Unit
PSC3.2.28 Manholes, catchpits, precast inlet and outlet structures complete:	
(a) Manhole drop inlet (Irrespective of depth)	No
(b) Grid inlet complete for 600mm dia. pipe (Irrespective of depth)	No
(c) Grid inlet complete for 900mm dia. pipe (Irrespective of depth)	No
(d) Grid inlet complete for 1200mm dia. pipe (Irrespective of depth)	No

The unit of measure shall be number of grid inlets, catchpits and headwalls constructed according to the standard detail irrespective of depth.

The tendered rate shall provide full compensation for all plant, material, transportation, labour and profits for the construction of grid inlets, catchpits and headwalls according to the standard detail provided irrespective of depth. Specific reference is made to detail drawings KSIA-CIV-SD-032A.

COTO CHAPTER 4: EARTHWORKS AND PAVEMENT LAYERS: MATERIALS

SECTION 4.2: CUT MATERIALS

PART C: MEASUREMENT AND PAYMENT

Add the following new payment item.

Item	Unit
PSC4.2.13 Dewatering excavations throughout the earthworks and fill operations by means of pumping.....	Lump Sum

The unit of measure shall be lump sum.

The tendered rate shall provide full compensation for all plant, material, transportation, labour and profits for the dewatering of excavations, cuts and fill operations for the duration of the Contract.

All cuts, fills and earthwork operations shall remain free from any ground water whilst works are being conducted.

Minimum 6inch diesel engine driven self-priming pump required with minimum flow of 335m³/h

Payment of the lump sum tendered will be made in three instalments.

- (1) The first instalment, 50% of the lump sum, will be made in the first payment certificate after the contractor has made a substantial start with construction in accordance with the approved programme.
- (2) The second instalment, 35% of the lump sum, will be paid when the value of the work reaches one half of the tendered amount, excluding contingencies and price adjustments
- (3) The third and final instalment, 15% of the lump sum, will be paid when the work has been completed and certificate of practical completion has been issued.

COTO CHAPTER 4: EARTHWORKS AND PAVEMENT LAYERS: MATERIALS

SECTION 4.4: COMMERCIAL MATERIALS

PART A: SPECIFICATIONS

PART C: MEASUREMENT AND PAYMENT

Add the following new payment item.

Item	Unit
PSC4.4.8 Supply and lay Rock Grid 200/200 as per detailed drawings.....	m²

The unit of measure shall be number metre squared of rock grid supplied and installed.

The tendered rate shall provide full compensation for all plant, material, transportation, labour and profits for the supply and installation of the rock grid 200/200 as per the detailed drawing KSIA-CIV-TX-004C.

Material - Polyester, staple fibre 150 g/m2 needle punched, nonwoven / high strength polyester yarns.

Short Term Tensile Strength:

- Machine – 200 kN/m
- Across – 200kN/m
- Elongation – 10%

Long Term Design Strength (LTSD) 120 years – 105kN/m.

The rock grid 200/200 specification shall be submitted to the Engineer for review and approval prior to the material being procured. The contractor shall ensure that sufficient time is allowed within the programme for approval and procurement of the product.

PSC4.4.9 Supply and lay Bidim A4 Geotextile	m²
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The unit of measure shall be number metre squared of Bidim A4 geotextile supplied and installed.

The tendered rate shall provide full compensation for all plant, material, transportation, labour and profits for the supply and installation of the Bidim A4 geotextile as per the detailed drawing KSIA-CIV-TX-004C.

COTO CHAPTER 5: EARTHWORKS AND PAVEMENT LAYERS:
CONSTRUCTION

SECTION 5.1: ROADBED

PART A: SPECIFICATIONS

A5.1.7 EXECUTION OF THE WORKS

A5.1.7.3 Normal roadbed treatment

Add the following new subclause:

(j) Improvement of the taxiway strips

Electrical conduits and any other instrumentations shall be identified and where required protected against possible damage by the contractor. The contractor shall take cognisance of Clause A2.1.3 when working within the runway strips.

This section also covers the construction of the shoulder drainage improvements on the taxiways at King Shaka International Airport.

PART C: MEASUREMENT AND PAYMENT

In addition to the following payment item.

Item	Unit
PSC5.2.2.4 Rock fill material all as per Clause A5.2.7.6.....	m ³

In additional to the pay item, allowance for laying, spreading and choking imported G5 material on top of the final rock fill layer shall be allowed for.

COTO CHAPTER 8: PRETREATMENT AND REPAIR OF EXISTING LAYERS: CONSTRUCTION

SECTION 8.8: PATCHING AND EDGE BREAK REPAIR

PART A: SPECIFICATIONS

PART C: MEASUREMENT AND PAYMENT

Add the following pay item:

Item	Unit
PSC8.8.7 Reconstructing edges as per Engineers Detail Drawing (KSIA-CIV-TX-004)....m ²	

The unit of measure shall be metre squared of edge break repaired complete.

The tendered rate shall include full compensation for all plant, material, labour and profit for the repair of edge breaks as per detailed drawing (KSIA-CIV-TX-004). The rate shall include for saw cutting, excavation, import of material, prime coat, tack coat, asphalt and all necessary quality control required. All excavated material shall be spoiled at an approved spoil site which is included in the rate.

Item	Unit
PSC8.8.8 Supply and install 150mm x 150mm x10mm steel plate epoxied over existing lighting core holes on Bravo Taxiway. The rate is to include GPS logging of the existing lighting core holes before the steel plate is installed.....No	

The tendered shall be number of 150mm x 150mmx 10mm steel plates installed and GPS logged over the existing lighting cores on Bravo Taxiway, Shoulder and Tie-In areas.

All existing cored positions along the existing Bravo Taxiway, Shoulder and Tie-In areas for lighting are to have a 150mm x 150mm x 10mm thick square steel plate epoxied to the existing pavement before paving is set to begin. The steel plate positions are to be GPS positioned by the Contractor.

The pay item shall include full compensation for the supply, installation and GPS logging of the existing lighting core holes.

Coring through the newly paved acephaly layers to expose the original lighting core holes shall be done after all paving has been completed and instructed by the Engineer. The item shall be paid under Chapter 9 Coring of asphalt layers.

COTO CHAPTER 9: ASPHALT LAYERS

SECTION 9.1: ASPHALT LAYERS

PART A: SPECIFICATIONS

A9.1.3 GENERAL

A9.1.3.4 Weather limitations

Add the following paragraph:

Should rain or cold weather threaten, all exposed areas shall immediately be reinstated with asphalt and milling operations shall cease.

A9.1.6.6 Binder distributors

- (i) Tack coat

Add the following paragraph:

The equipment shall comply with clause A1.2.6. Tack coat shall be applied to all transverse and longitudinal joints in the asphalt surfacing and base layers by hand utilizing a paint brush.

A9.1.5 MATERIALS

A9.1.5.2 Bituminous binders for asphalt mixes

Reference is drawn to the SANS BITUMEN SPECIFICATIONS of the project specifications with regards to SANS Bitumen Specifications that shall apply to this contract

- (i) Conventional binders as specified in SANS 4001-BT1

Add the following:

The binders shall comply with SANS 4001-BT1 Latest Amendment. The Contractor shall submit the following to the Engineer for each batch of bitumen used on site:

- A copy of the SANS quality certificate, indicating the batch number and grade.
- A sample of the (base) bitumen.
- The source of the bitumen.

The Engineer will require the Contractor to submit samples of the bitumen to an approved accredited laboratory at random intervals to check compliance with the SANS 4001 criteria. The cost of these additional tests will be reimbursed through a prime cost item. (C20.1)

Add the following:

The supplier of the A-P1 binder shall quantify the fuel resistant properties of the binder according to both the CEN standard EN 12697-43:2005 (use in Europe) and NF P 98-251-1 (French standard). The engineer will approve the binder if sufficient evidence is provided that it is fit for purpose in terms of fuel resistance. The required information shall be submitted at the onset of the project prior to any paving operations taking place.

A9.1.5.3 Bitumen bond coat

Add the following:

The initial application of bond coat on all existing asphalt surfaces for the taxiway and shoulders shall consist off an E36 Cationic bitumen emulsion 60% with the addition of organo functional silanes, 3% SBR latex and trackless properties. The required product meeting the above specifications shall be submitted to the Engineer for review and approval 28 days before any tack/bond coat is applied

A9.1.6 CONSTRUCTION EQUIPMENT

A9.1.6.1 General

A9.1.6.3 Paver

Add the following:

The paving of the asphalt surfacing and base layers shall be controlled by automatic screed level controls or similar approved methods to achieve the specified levels and thickness.

The following methods shall be adopted:

- Averaging beams (levelling beams) are to be used for the asphalt surfacing and base layers. They shall be at least 9 m long and shall be assembled from rigid sections having multiple spring-load feet.
- Joint matching shoe consisting either of a contact type of non-contact sensor to ensure matching levels across the joint.
- Contact Cross-fall Sensor shall be used in conjunction with a joint matcher to ensure the correct levels/grades are being achieved.

The paver must be tracked, high pressure heavy weighted screed and contain all automated/digital slope sensors.

All levelling equipment shall comply with minimum of 5 transducers (sensing elements) per sensor with a smart controller.

The Contractor shall provide a detailed methodology for approval by the Engineer for the automated screed levelling controls to be utilised before any paving may commences. The methodology shall be submitted 28 days prior to any paving operations taking place. A technical meeting 28 days prior to any paving operations taking place shall be conducted with the engineer, subcontractors, suppliers and the acceptance laboratory. The onus is on the Contractor to schedule the technical meeting and include sufficient time in the programme.

A9.6.6 Rollers

Replace the next sentence in the first paragraph with the following:

Approved tandem-axled steel-wheel rollers with a minimum roller width of 1,5 m and a minimum length of 2,0 m must be used for initial rolling. The roller drum must be smooth without any indentations or marks that may lead to pick-up of the asphalt mat. A 25-ton pneumatic roller must be used for the final rolling and finishing of asphalt surfacing. The use of the pneumatic roller shall be assessed in the trial section.

All rollers used for the processing of asphalt shall be Intelligent Compaction Rollers utilising technologies for monitoring and control asphalt compaction in real-time, enhancing the quality and efficiency by tracking roller passes, asphalt temperatures, and material stiffness.

The Intelligent Rollers shall be equipped with sensors, including accelerometers, GPS, and infrared temperature sensors to collect data on roller passes, asphalt surface temperatures and material stiffness.

A9.1.6.6 Binder distributors

- (i) Tack coat

Add the following paragraph:

The equipment shall comply with clause A1.2.6. Tack coat shall be applied to all transverse and longitudinal joints in the asphalt surfacing and base layers by hand utilizing a paint brush.

A9.1.6.8 Material Transfer Vehicle

In addition to the clause no asphalt mix shall be placed without passing through a material transfer vehicle.

Add the following new subclause:

A9.1.6.11 Infrared Joint Heater

The paver must be fitted with an infrared joint heater.

The infrared joint heater must comprise of an aluminium frame with 6 burner heads, and an electrical circuit that will open the gas flow and ignite the gas in the burners when power is applied to the circuit. The 6 burner Joint Heater shall be upgraded on the request of the Engineer with an additional 4 burner extension kit to a total of 10 burner heads if required.

Installation & Operation of the Infrared Joint Heater:

- The user must take great care in installing the Joint Heater in such a way that it will not be a hazard to the paver, the surroundings and the people working around the area due to the excess heat generated.
- The Infrared Joint Heater must be mounted on the side of the asphalt paver extended in forward direction from the side arm of the screed. To achieve the optimum temperature in the joint the Infrared Joint Heater must be mounted in a such a way that the distance between the burners and the surface can be adjusted.
- The distance will vary depending on different factors such as surface temperatures, wind-chill, paver speed, number of burner heads and gas pressure.
- The Infrared Joint Heater must be suspended on chains from the Infrared Joint Heater Mounting arms, mounted on the machine. The Infrared Joint Heater Mountings make it easy to attach, adjust and detach the Infrared Joint Heater.
- The Infrared Joint Heaters must be supplied with propane-butane gas at a working pressure of 0.5-1.5 bar. The gas is supplied from the source to the gas inlet flange on the Infrared Joint Heater via an approved and heat resistant gas hose. Make sure that working pressure is correct and there is no leakage from the hose.
- The Infrared Joint Heaters electrical circuit is powered by 12/24VDC depending on Infrared Joint Heater type. Power is supplied from the machine to the power socket on the frame of the Infrared Joint Heater using the coiled power cable.
- When powered up the Infrared Joint Heaters solenoid valve will open for gas to the burners and the spark plugs will start igniting.

Safety Instruction:

- Use extreme caution at all times operating the Infrared Joint Heater.
- Propane-butane gas has a distinct odour. If you smell it, immediately discontinue work, extinguish all flames, and check for gas leakage in the system. Using soapy water, check all connections and fittings for leaks. Do not use a match or open flame.
- Never leave an Infrared Joint Heater in operation unattended. Always monitor that the burners are working correctly and they are not doing damage to the surroundings.
- Always have fire extinguishing equipment on site.
- Heat resistant gloves should be used when handling the Infrared Joint Heater. Long sleeves, long pants, and boots are recommended when working near the burners.
- Always disconnect the Infrared Joint Heater when the paver is not in forward movement to prevent overheating the surface below the burners.

Technical Specifications:**Infrared Joint Heater**

- Burner Heads – 6 minimum
- Power Supply – 12/24VDC
- Output 40kW at 1.5 bar
- Dimension – 180x30x40 cm

Connector Kit

- 1 x 12V interconnecting cable
- 1 x Has hose 0.4m
- 2 x Quick release hose clam
- 2 x PVS cable binder
- 1 X Hose flange
- 2 x M8x30 Cap Screw w. nut
- 1 x M8x70 Cap Screw

A9.1.7 EXECUTION OF THE WORKS**A9.1.7.4. Transporting the mixture**

Add the following:

Segregated mixes will under no circumstances be accepted by the Engineer. Effective steps must be taken by the Contractor to prevent segregation. Trucks with segregated asphalt mixes will be rejected by the Engineer.

Special precautions shall be taken by the Contractor to ensure that the temperature of the total mass of asphalt does not decrease by more than 15°C from point of dispatch to the point where it is to be placed.

A9.1.7.6 Placing the asphalt

Add the following to subclause (a):

The following paving restrictions will strictly apply:

- No paver stops will be allowed for reversing supply trucks.
- All asphalt shall be passed through a material transfer vehicle.
- Continuous paving operation is a requirement. Paver speed to be regulated to prevent supply related stops. Paving operations may only start if sufficient asphalt supply trucks are available to ensure a continuous paving operation.

- Levelling skid-beams (9 m length at least) are to be used on both sides.
- Automatic auger feed control, which can keep the asphalt mount in-front of the screed constant, is required.
- Automatic levelling equipment to be calibrated and set before paving commences.
- The Infrared Joint Heater is to be attached to the paver and be in full operation before paving commences.
- No pneumatic rolling as breakdown rolling on the final surfacing layer.
- Handwork shall not be allowed.
- No fat spots or loose stones.
- No water ponding.

In the case of non-compliance herewith the Engineer's personnel will stop the paving operations and sections done in non-compliance can be rejected after assessment by the Engineer.

The Contractor shall have a full fleet of standby plant available during any paving operation.

A detailed methodology for the paving operations shall be compiled and submitted to the Engineer for approval before any paving commences. The cost for the methodology shall be deemed included in the tendered rates for asphalt surfacing and base layers. The methodology shall be submitted 28 days prior to any paving operations taking place. A technical meeting 28 days prior to any paving operations taking place shall be conducted with the engineer, subcontractors, suppliers and the acceptance laboratory. The onus is on the Contractor to schedule the technical meeting and include sufficient time in the programme.

Specific reference is made to detailed drawings KSIA-CIV-TX-004A, KSIA-CIV-TX-004B, KSIA-CIV-TX-004C, KSIA-CIV-PL-005 and KSIA-CIV-PL-006 for specific paving details and zone.

Add the following new subclause

a) Asphalt Surfacing And Base Layers

All joints not paved with tandem pavers will be considered to be cold joints with reference to joint treatment preparation. All asphalt joints shall be cut back by an approved roller wheel or milling machine in a straight line to the satisfaction of the Engineer.

The lateral distance between joints of two (2) successive asphalt layers shall not be less than 200 mm.

Where the difference in level between the new work and the existing road surface exceeds 25 mm, joints shall be treated as follows:

Transverse steps at the end of a day's work on operational runways and taxiways shall be tapered off at a slope of 1 vertical to 20 horizontal (1:20) to tie in with the existing surface. The tapered section shall be removed before surfacing is recommenced and a joint formed. Longitudinal joints exposed to traffic shall be provided with a taper of compacted asphalt material over the full length of the exposed joint. The width of the taper shall be at least 5 times the difference in level between the old and new work.

All costs involved in the provision and removal of these temporary ramps shall be deemed to have been included in the rates tendered for the relevant asphalt pay item.

b) Longitudinal Joints

Longitudinal joints are formed between adjacent pavement layers either operating close together in echelon (hot joints) or where the first lane has cooled significantly (e.g. below 100°C) and was compacted and finished before paving of the adjacent lane (cold joints).

Longitudinal joints shall be cut back as specified in a) above.

No saw-cutting will be allowed on newly placed asphalt surfacing and base layers.

Whenever the paver stops for more than 5 minutes on thinner wearing course layers and/or the uncompacted material already laid cools down to below compaction temperature (110°C for wearing course), a joint shall be constructed as specified and all cooled uncompacted materials removed from the pavement.”

Longitudinal joints are to be planned such that they do not coincide with the joints in the lower layers of the asphalt base when paving more than 1 lift. Specific reference is made to detailed drawings KSIA-CIV-TX-004A, KSIA-CIV-TX-004B, KSIA-CIV-TX-004C, KSIA-CIV-PL-005 and KSIA-CIV-PL-006 for specific paving details and zone.

Joints in lower layers shall be offset by not less than 150mm from either side of the edges of any underlying substrate joint. An example for the offset is as follows: the bottom lift should extend 300mm on one side of the centreline of the second lift, 300mm on the other side of the centreline and the surfacing joint on the centreline.

All joints are to be constructed in such a way that full compaction is achieved right into the corners to ensure that there is adequate bonding between every longitudinal joint, an infrared joint heater or similar approved heating device shall be used.

All joints are to be fully tacked to the same specification and to at least the specified spread rate for the base to ensure a watertight bond.

As the end of the screed is at right angles to the direction of placing, it is recommended that a slight angle of up to 15 degrees be accommodated. Joints at the end of the surfacing are to be tapered at 45 degrees.

In areas where there is more than 1 lift being paved in the day's production, the lower lift must be allowed to cool to a maximum temperature of 30 degrees Celsius before tacking and paving the next lift.

c) Longitudinal Joint – Hot Joints

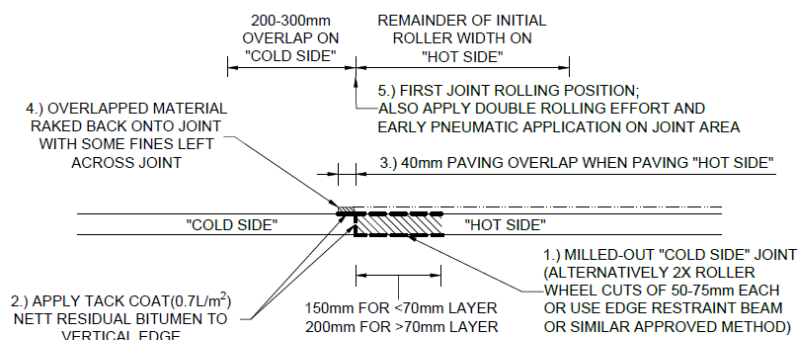
The centre line lanes of the taxiway shall be paved in echelon to achieve a hot joint. The hot joint shall be achieved by two or more pavers which are operating in echelon. The pavers shall be spaced closely that the lane place first does not cool significantly before the second lane is placed adjacent to the first lane. The longitudinal joint must be compacted when the Hot Mix Asphalt on both sides of the joint is within the specified compaction temperature range. Specific reference is made to detailed drawings KSIA-CIV-TX-004A, KSIA-CIV-TX-004B, KSIA-CIV-TX-004C, KSIA-CIV-PL-005 and KSIA-CIV-PL-006 for specific paving details and zone.

d) Longitudinal Joint – Cold Joint

The following method shall be used for the construction of cold joints:

1. Milled-out "cold side" joint (alternatively 2x roller wheel cuts of 50-75mm each or use edge restraint beam or similar approved method).
2. Apply tack coat (0.7l/m²) nett residual bitumen to vertical edge by hand.
3. 40mm paving overlap when paving "hot side".
4. Overlapped material raked back onto joint with some fines left across joint.
5. First joint rolling position. Apply double rolling effort and early pneumatic application on joint area.

Graphical representation of the process can be found below:



COLD JOINT CONSTRUCTION TECHNIQUE

Specific reference is made to detailed drawings KSIA-CIV-TX-004A, KSIA-CIV-TX-004B, KSIA-CIV-TX-004C, KSIA-CIV-PL-005 and KSIA-CIV-PL-006 for specific paving details and zone.

d) Echelon Paving

The pavers operating in Echelon shall be within 9 metres of each other. The end gate of the trailing paver should not extend more than 25mm onto the adjacent Hot Mix Asphalt placed by the leading paver. This will prevent the end gate of the screed of the trailing paver from dragging on the Hot Mix Asphalt already placed by the leading paver. Careful attention to the overlap shall be required to ensure that no raking is required. The breakdown roller which is compacting the Hot Mix Asphalt shall be kept at least 150mm away from the edge of the mat. After the trailing paver places the Hot Mix Asphalt against the uncompact edge of the first lane, the rollers that are working behind the trailing paver shall be used to compact the Hot Mix Asphalt on both sides of the joint.

e) Transverse Joints

Transverse joints are formed at a point where work is resumed after a stoppage or at the end of the day's work. Since a poorly constructed transverse joint will cause a noticeable bump and/or durability problems, particular care should be taken to ensure a smooth riding surface.

It is suggested that transverse joints be constructed at an angle to reduce the possibility of creating a bump in the surfacing. To ensure a uniform thickness of asphalt at a transverse joint, it is highly important for the paver to continue in the normal fashion right up to the point where the joint is to be formed. This implies that the head of material in front of the screed remains at a consistent level up to the location of the joint to ensure that the forces acting on the screed remain in equilibrium with a constant angle of attack.

It is important to note that the paver should not be allowed to run empty when a transverse joint is to be formed. Where the end of the day's work is perceived to be, the layer is to be tapered, and the next day milled & replaced with new asphalt.

Careful consideration must be taken to ensure that compaction has reached the full layer right into the bottom corner of the transverse joints.

Milling back into the new work gives a compactable curved face at the bottom. The top shall be cut vertically to 3 times the maximum stone size to prevent feathering.

f) Cutting Joints

All joints between adjacent sections of the work shall be formed by cutting back the edges of the paved layer in a straight line, either parallel or at right angles to the centreline, by a minimum width of the layer thickness being paved. Joints shall be neat and shall have the same texture and compaction level as the adjacent asphalt layer.

All joints shall be delineated by means of chalk lines prior to cutting. In layers in excess of 50mm or that have been left for longer than 24 hours, the joints shall be formed either by means of saw cutting, using carborundum blades, or by an appropriate milling machine. All material emanating from preparing the joint shall be removed and transported to an approved site for possible recycling or other appropriate use or disposal. No payment for such removed asphalt shall be made.

On completion of preparing the joint, the adjacent surface shall be inspected to ascertain that there has been no damage caused to the adjacent layer. Any identified damage shall be appropriately repaired prior to the commencement of paving any adjacent asphalt layer.

A9.1.7.7 Compaction

Add the following:

An appropriate rolling temperature range will be determined by the Contractor and will be submitted to the Engineer for verification during the trial sections. This range will be applied as specification during the contract.

The sequence of rollers used in compaction is at the discretion of the Contractor (except as specified for pneumatic rolling) provided the completed layers shall have minimum and maximum density as specified in table A9.1.7.7/1 below.

Table A9.1.7.7/1: Minimum and Maximum Compaction Density Specifications

Layer	Min Density	Max Density
Wearing Courses	97% - Design voids $\pm$ 1% of MVD, absolute minimum 93% MTRD	96% MVD
EME Base Mixes	96% MVD minimum	100% MVD
BTB Mixes	97% - Design voids $\pm$ 1% of MVD, absolute minimum 93% MTRD	96% MVD

In addition, hereto the compacting the following shall apply in reference to all joint construction:

- i) Core samples shall be extracted adjacent longitudinal joints as part of normal quality control operations, and when directed by the Engineer, across transverse joints.
- ii) Cores adjacent to longitudinal lane joints shall be situated at a distance not exceeding 50mm from the joint. For transverse joints, cores shall be extracted on the joint.

In addition, hereto the compaction immediately adjacent to joints and across the joints shall be done to ensure densities as per the minimum specified layer density. A combination of asphalt cores and Marvel permeability testing will be used to access and approve joint densities before covering thereof with consecutive layers.

Add the following new clause:

A9.1.7.13 Placing The Asphalt At Night

(a) Weather Limitation

Asphalt may be mixed and placed only under favourable weather conditions and shall not be mixed or placed when rain is imminent or during misty or wet conditions. The following wind and temperature conditions shall be applicable:

- 6°C and temperatures are rising with an allowable wind velocity of less than 25 km/h
- 10 °C with an allowable wind velocity of less than 55 km/h for layers paved > 30 mm thick
- 10 °C with an allowable wind velocity of less than 25 km/h for layers ≤ 30 mm thick

With falling air temperature, paving shall cease when the air temperature reaches 6 °C regardless of the wind velocity, and may not be restarted before the temperature is definitely rising.

Where specifically ordered by the Engineer for emergency safety or traffic accommodation reasons, paving operations shall comply with the recommendations listed in: Sabita Manual 22: Hot Mix Paving in Adverse Weather.

The mixing and placing of asphalt shall not be permitted under the following conditions:

- The moisture content of the aggregate affects the uniformity of mix temperature
- Free water is present on the working surface, or if
- The moisture content of the upper 50 mm of a granular base layer exceeds 50 % of the optimum moisture content, as determined by the Engineer.

Immediately after a rainy spell on an existing partly cracked and/or highly permeable surfacing and/or primed base resulting in the trapping of moisture in the pavement structure. In such case the base shall be allowed to dry out to meet the above moisture content requirements prior to placing the asphalt layer.

In areas where there is more than 1 lift being paved in the night's production, the lower lift must be allowed to cool to a maximum temperature of 30 degrees Celsius before tacking and paving the next lift.

The Contractor must programme all night paving work to ensure that the minimum temperatures as stated above and in Sabita Manual 22 are achieved. No delays with respect to surface temperatures shall be considered ground for an Extension of Time. Specific Climate data can be found in Section C4.3 of the tender document.

(b) Production Of The Mix

In addition to the standard Clause A9.1.7.1 the Contractor will be required to engage with asphalt suppliers in order for the supply of asphalt for night work. Pre-arranged agreements must be submitted to the Engineer before any asphalt works can commence at night. All pre-arranged agreements must be submitted to the Engineer 28 days prior to any asphalt surfacing and base layers work commencing.

c) Vehicles

To minimize temperature loss, all vehicles used for transporting asphalt to the site shall be fitted with appropriate bin covers. The use of thermal asphalt covers (canvas covers are not acceptable) shall be obligatory.

Add the following new clause:

A9.1.7.14 Asphalt Paving Zones and Sequencing

Specific reference is made to detailed drawings KSIA-CIV-TX-004A, KSIA-CIV-TX-004B, KSIA-CIV-TX-004C, KSIA-CIV-PL-005 and KSIA-CIV-PL-006 for specific paving details and zone.

The Contractor shall adhere to the recommended paving zones and sequencing for the paving operations. The Contractor must programme all paving sequencing accordingly to ensure no delays are encountered during the paving operations.

Any deviation from the recommended paving zones and sequencing must be submitted to the Engineer for approval before any paving operations commence. Any deviations must be submitted to the Engineer 28 days prior to any asphalt work commencing for approval.

A9.1.8 WORKMANSHIP

A9.1.8.1 Dimensional tolerances – new construction & Rehabilitation

(a) Level and Grades

Replace the clause as follows:

The level tolerances shall be as follows:

H90 ± 10mm
Hmax ± 15mm

(c) Thickness

Allowable Tolerance	Asphalt Base (mm)	Asphalt surfacing (mm)
D90	5	5
D Maximum	8	8
D Average	2	2

A9.1.8.4 Surface regularity

Add the following:

Initial IRI Testing at the onset of the project on the existing surfacing shall be the responsibility of the Contractor and shall be deemed to be included in the tendered rates for all asphalt rehabilitation and new construction for the base and surfacing. The initial IRI testing shall be submitted to the Engineer 28 days prior to any asphalt operations taking place.

Any acceptance of asphalt quality control will not be deemed to include for this clause until such testing has been complete and finalised with the Engineer.

The Contractor is to supply surveyed levels of each layer (including the original surface) to the engineer at the centreline as well as at 4 m, 8 m, 12 m, 16 m, 20 m, 25 m and 29 m both sides of the centreline at 10 m intervals. These co-ordinated positions shall then be used for all subsequent surveyed layers.

Any corrective work required shall be made by the removal, through milling of the total asphalt layer width placed during a single pass of the paver over the 100m section in question, followed by reinstatement. The Contractor shall submit his method statement for any corrective work to the engineer for approval, prior to commencing with any corrective work. Corrective work shall be done at the Contractor's expense and shall be completed prior to determining pavement thickness. After completion of the corrective work, the 100m sections shall be re-evaluated according to the procedures outlined in Section A9.1.8.4.

A9.1.8.8 Sampling

(a) Coring of completed layers

Add the following at the end of the first paragraph:

No laying of asphalt surfacing shall be permitted unless a suitable core cutting machine is available on site at all times when asphalt paving is taking place. Cores shall be taken as directed by the Engineer. Cores may only be drilled when the layer surface temperature is less than 20°C. Core holes

must immediately after coring be filled with hot asphalt and compacted. Cores shall be taken within 48 hours of paving.

Add the following new sub-clauses:

(d) Quality Control

The Contractor will be required to submit his detailed Quality Assurance Plan (system) and methodology of paving to the Engineer for approval. Once approved, the Contractor shall not deviate from the system.

(e) Riding quality

The rolling straight edge test in the Standard Specifications will not be applicable except on the transverse construction / stop joints of all paved sections. The maximum irregularity measure with the wheels of the standard apparatus removed (only outer wheels at 3m spacing in place) shall be + or - 3mm. Joints that do not satisfy these criteria shall be milled and reconstructed over a minimum "10m in length" section."

The Contractor shall arrange for the IRI testing of all sections by a Laboratory approved by the Engineer, before the end of the Contract or when instructed within 21 days of such instruction. Costs for such testing of all relevant sections shall be deemed to be included in the rates of these wearing course layers; additional IRI testing as instructed by the Engineer shall be paid under **C9.1.14.2.** unless otherwise indicated by the Engineer.

(f) Special tests

(i) Recovery of binder for further testing

Extraction of bitumen and its recovery from samples taken from the asphalt layers shall be carried out in accordance with ASTM D1856/79 (Abson).

(ii) n-Heptane-xylene Equivalent (Spot Test) (AASHTO – T102)

If the Engineer considers that bitumen or asphalt has been overheated, he may order that the bitumen or the bitumen recovered from the asphalt be subjected to the spot test.

Recovery of binder for use in the spot test shall be carried out as described above.

Any sample showing an n-Heptane-xylene equivalent in excess of 36 or if the bitumen contains a proportion of bitumen prepared from cracked stock, in excess of the manufacturers test result on the new stock, shall be considered to have been overheated and shall be rejected.

(iii) The following additional test shall be carried out on asphalt samples taken from the paver hopper:

- Penetration of recovered binder @ 25°C (Method ASTM D5)

Should the penetration of the recovered binder be less than 24 at 25°C, the asphalt layer shall be deemed to be unsatisfactory and shall be condemned by the Engineer. The Engineer on site shall decide the frequency of testing.

(g) As-Built

The Contractor shall keep accurate records and submit the following information to the Engineer on a daily basis:

- I. Where every truckload of asphalt is laid (load, position, lane, time and date).

- II. The truck number from which control samples have been taken. All samples taken from trucks shall be numbered.
- III. The temperature of the asphalt in the truck both at the mixing plant and at the paving equipment.
- IV. Process control results

These shall be summarised on a spreadsheet/database and mapped for as-built purposes and supplied to the engineer on a daily basis.

A9.10.10 Acceptance Criteria

D9.1.10.4 Roughness

In additional to table D9.1.10-4 add the following for Airport Taxiways and Shoulders:

Acceptance Criteria for IRI Roughness Values

Limit Value (Average 100 m IRI)	Maximum (%) of 1 km Segment with Roughness Worse Than Limit Value
1.40	20%
1.60	5%
2.00	0%

COTO CHAPTER 11: ANCILLARY ROAD WORKS

SECTION 11.7: ROAD MARKINGS AND ROAD STUDS

PART A: SPECIFICATIONS

A11.7.3 GENERAL

Add the following to A11.7.3 GENERAL:

Where the runway or taxiway is to be re-opened to traffic after shifts, the Contractor will be required to apply all necessary paint markings at completion of each such shift within a designated area. The paint shall be non-reflectorised and applied strictly in accordance with the manufacturer's instructions. The paint shall be normal road marking paint complying with SABS 731. Solvent-based paints will be used for temporary paint markings and water-based paint for all permanent paint markings. At the start of the project, the Contractor will supply samples of the paint he intends to use and apply trial sections to the satisfaction of the Engineer which will also include environmental risk mitigation measures to be implemented and maintained as well as waste management.

SECTION 11.8: LANDSCAPING AND PLANTING PLANTS

PART A: SPECIFICATIONS

A11.8.7 EXECUTION OF THE WORKS

A11.8.5 MATERIALS

A11.8.5.2 Materials

d) Grass seeds

Add the following grass seed mixture:

Latin Name	English Name	kg/ha
Eragrostis tef	Teff	2,0
Digitaria eriantha	Finger grass	5,0
Chloris guyana	Rhodes grass	4,0
Cenchrus ciliaris	Blue Buffalo grass	4,0
Cynodon dactylon	Couch grass	7,0
Aristida congesta	Three lawn grass	2,5
Melinis repens	Natal red top	2,5
Panicum coloratum	White Buffalo grass	2,5
Andropogum eucomus	Snowflake grass	2,5
Imperata cylindrica	Cottonwool grass	2,5
	Others to be added	0,5
Total		35,0

A11.8.7.1 Landscaping the areas

(a) Shaping

Replace the term “road reserve” with “taxiway end safety areas and taxiway strips”

A11.8.7.3 Grassing

(c) Hydroseeding

Add the following:

During seeding, the seed mixture shall be regularly mixed by hand in order to prevent the separation of smaller and larger seeds in the mixture. After seeding, the soil surface shall be lightly raked parallel to the contours in order to cover the seed. During raking, care shall be taken to prevent the redistribution

or removal of seed from any area. Seeding to comply with supplier's guidelines and all additional costs are deemed to be included in tendered rates. This includes shade netting at areas close to runway thresholds."

A11.8.7.4 Maintaining the grass cover.

(a) Watering, weeding, mowing and replanting.

Add the following to the second paragraph:

"The Contractor shall remain off newly grassed areas or areas that have been prepared for grassing. Any damages caused by the Contractor to newly grassed areas or areas that have been prepared for grassing shall be repaired to the satisfaction of the Engineer, at the Contractor's own expense."

(c) Maintenance period

Add the following before the first paragraph:

"In this subclause all reference to the maintenance period in respect of grass shall mutatis mutandis also apply to the maintenance of the shade netting required to protect the grass sods or newly planted hydroseed against the damage caused by jet blast. The maintenance period is also one (1) year and comprises the repair and securing of the netting as and when required by the Engineer. The Contractor may be required to remove the netting before the maintenance period has expired."

COTO CHAPTER 20: QUALITY ASSURANCE

SECTION 20.1: TESTING MATERIALS AND JUDGEMENT OF WORKMANSHIP

PART A: SPECIFICATION

Replace all references to “TMH5” in this section with: “SABITA Manual 37 / TMH5 (latest edition).”

A20.1.2 DEFINITIONS

Independent site laboratory

In the definition of “Independent site laboratory”, add the following:

“Independent Site laboratory in COTO is equivalent to the combined laboratory in the Employer documentation.”

A20.1.3 TESTING METHODS

A20.1.3.2 Standard Methods

Add the following to the last paragraph:

Replace all references to “TMH5” in this section with: “SABITA Manual 37 / TMH5 (latest edition).”

Add the following new clause:

A20.1.3.5 Asphalt Testing and Time Frames

Samples for the day for hot boxes must be taken at the asphalt plant by the Acceptance Lab. The Acceptance Lab must be given a minimum of 24 hour notice of when any asphalt paving will be taking place. Notice shall be given to the Engineer of which same shall be communicated to the Acceptance Lab timeously.

All test results from the Acceptance Lab will be made available within a minimum time frame of 3 days. During this minimum 3 day period the Contractor shall continue their paving operations on the existing lift however the Contractor cannot proceed with paving on the second lift until test results are made available by the Acceptance Lab and is passed by the Engineer.

The second lift on any asphalt layers shall only commence when the first lift is approved by the Engineer and formal instruction by the engineer is issued.

The Contractor shall account for the above mentioned procedures regarding asphalt testing and paving operations within their programme.

A20.1.4 PUBLISHED TEST METHODS

A20.1.4.8 Testing of asphalt

Add the following new paragraph:

“Sabita Manual 39: Laboratory Testing Protocols for Binders and Asphalt, shall be implemented together with the asphalt tests listed.”

Delete reference to: “Sabita Manual 35 for Design and Use of Asphalt in Road Pavements: Determining the Richness Modulus of EME asphalt mixes.”

and replace with “Sabita Manual 33 for Design Procedure for High Modulus Asphalt (EME): Determining the Richness Modulus of EME asphalt mixes.”

A20.1.7 ACCEPTANCE CONTROL BY STATISTICAL JUDGEMENT PRINCIPLES

A20.1.7.5 Assessment Methods

Judgement Plan A shall be used to assess concrete cover and concrete durability.

Judgement Plan B shall be used to assess the following:

- Gravel pavement layers – Relative Compaction.
- Crushed-stone base or subbase and Bound Macadam (BM) - Relative Compaction.
- Asphalt base and surfacing - Relative compaction, Binder content of mix and void content of mix.
- BSM layers - Relative compaction.
- Structural Concrete – Compressive strength.
- Concrete for pavements - Compressive strength.

C20.1 TESTING MATERIALS AND JUDGEMENT OF WORKMANSHIP

PART C: MEASUREMENT AND PAYMENT

Item	Unit
<i>Add the following new pay item:</i>	
PC20.1.6 (a) Provision for testing materials and judgement of workmanship	Prime cost (PC) sum
(i) Handling cost and profit in respect of item C20.1.6.1	Percentage (%)

The contractor shall pay the appointed site laboratory monthly for the amount as certified by the Engineer.

The independent site lab shall be responsible for all acceptance control testing and additional tests as requested by the Engineer.

The charge or mark-up tendered or allowed for is a percentage of the amount actually paid under the prime cost item. The percentage shall cover all the Contractors' sourcing, handling, profit, and payment of the service provider in providing the services. The Contractor shall forfeit his mark-up when the service provider is not paid in time."

SECTION B: SPECIFIC DATA

Notes to tenderer:

- 1. In certain clauses, the Standard Specifications allow a choice to be specified in the Contract Documentation or Project Specifications between alternative materials or methods of construction and for additional requirements to be specified to suit a particular contract. Details of such alternatives or additional requirements applicable to this contract are contained in this Section B: Specification Data.
- 2. The number of each clause and each payment item in this part of the project specifications follows the numbering format of the COTO standard specifications. Where, however, a clause has been amended under Section A2, the clause number is prefixed with a “P” in this Section.

TABLE A1.1-7: GENERAL

CH	SEC	CL	SUB-CLAUSE	SPECIFICATION DATA												
1			GENERAL													
	A1.1		GENERAL PREAMBLE													
		PA1.1.2	DEFINITIONS													
			Conditions of Contract	The General Conditions of Contract for Construction Works, 2015, Third Edition, (GCC 2015)., shall apply												
			Site/ Site of Works	The limit of construction is provided in Part C4: Project Information and also shown on the Layout Plans												
	A1.2		GENERAL REQUIREMENTS AND PROVISIONS													
		A1.2.3	GENERAL													
			A1.2.3.4 Extension of time for delays caused by rainfall													
			c) Method 2 (Critical path method with consequential delays)	Method 2 (Critical path method with consequential delays) is specified. The value of "N" is 27. In calculations of payment for approved extensions of time granted for delays caused by rainfall, payment will be made utilising the applicable payment items for which the unit of measurement is "month" but excluding payment items with negative rates and non-applicable payment items such as pay item .												
			A1.2.3.9 Monthly reports	Other information to be included in monthly progress reports are as follows: Information as required in terms of Conditions of Contract												
			A1.2.3.10 Notices, signs and advertisements	Details of the contract sign board is provided in Drawing No: KSIA-CIV-RS-034												
			A1.2.3.12 Ownership of assets and disposal of non-usable assets	The Non-usable assets to be disposed by the Contractor is listed in the following disposal plan: Disposal plan<table><tr><td>Asset description</td><td>Estimated quantity</td><td>Disposal requirement</td></tr><tr><td>Replaced electrical lights</td><td>To be determined during construction</td><td>Arrange with KSIA maintenance personnel</td></tr><tr><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td></tr></table>	Asset description	Estimated quantity	Disposal requirement	Replaced electrical lights	To be determined during construction	Arrange with KSIA maintenance personnel						
Asset description	Estimated quantity	Disposal requirement														
Replaced electrical lights	To be determined during construction	Arrange with KSIA maintenance personnel														
		A1.2.7	EXECUTION OF THE WORKS													
			PA1.2.7.1 Programme of work													
			a) General	A Scheme 2 programme shall apply												

CH	SEC	CL	SUB-CLAUSE	SPECIFICATION DATA
			b) Scheme 2	The programme shall be drawn up or be compatible with MS Project
	A1.3		CONTRACTOR'S SITE ESTABLISHMENT AND GENERAL OBLIGATIONS	
		A1.3.3	GENERAL	
			A1.3.3.1 Construction camps	ACSA-owned land is available for the use of the contractor for his construction camps, offices, stores, workshops and/or testing facilities.
	A1.4		FACILITIES FOR THE ENGINEER	
		A1.4.3	GENERAL	Site facilities to be provided by Contractor as specified and agreed with the Engineer
		A1.4.7	EXECUTION OF THE WORKS	
			A1.4.7.1 Offices and laboratories	The site shall be fenced with a 2,4m high security fence with a razor-cut wire being used as strands or with a brick wall.
			a) General	The site laboratory shall be supplied with three-phase electricity
			b) Offices	As specified and agreed with the Engineer
			c) Laboratories	As specified and agreed with the Engineer
			f) Ablution unit	As specified and agreed with Engineer
			A1.4.7.3 Services	
			b) Water, electricity and gas	An on-site generator shall supply electricity when power from a recognized power-supply authority is not available to the Engineer's offices, laboratories and housing
			A1.4.7.5 Office staff	As per pay item
	A1.7		LOADING AND HAULING	
		A1.7.7	EXECUTION OF WORKS	The Contractor must provide the Engineer with the certified carrying capacity of each vehicle before any construction materials can be transported

TABLE A2.1-2: SERVICES

CH	SEC	CL	SUB-CLAUSE	SPECIFICATION DATA
2			SERVICES	
	A2.1		GENERAL REQUIREMENTS AND TRENCHING FOR SERVICES	
		A2.1.1	SCOPE	
			A2.1.1.2 Location, identification, protection and relocation of existing services	Location, identification, protection and relocation of existing services will be done on site with the assistance of ACSA maintenance personnel. CAD survey drawings will be supplied to the appointed contractor.
		A2.1.3	GENERAL	
			A2.1.3.2 Location, identification, protection and relocation of existing services	
			a) Existing as-built records	Incorporated in construction drawings
			A2.1.7.6 Ownership, removal and disposal of existing service materials	ACSA remains the owner of removed services unless this ownership is deferred. Contractor shall then become the owner of specific recovered service materials and shall be responsible for the disposal of the materials and for providing the Engineer with a full record of the disposal of the materials for control purposes
	A2.2		DRY SERVICES	
		A2.2.1	SCOPE	Service ducts to be installed for existing and/or new services at all taxiway/ road crossings forming part of project, exact location of existing to be determined on site by appointed contractor.
			A2.2.1.1 General note	In certain SANS documents referred to in this Section the term “specified in the scope of work” is used. For the purposes of this specification the term shall be deemed to mean “specified in the Contract Documentation
		A2.2.5	MATERIALS	Ducts/ sleeves to be uPVC pipes and/or precast concrete pipes as shown on drawings or instructed by the Engineer

TABLE A3.1-2: DRAINAGE

CH	SEC	CL	SUB-CLAUSE	SPECIFICATION DATA
3			DRAINAGE	
	A3.1		DRAINS	
		A3.1.5	MATERIALS	
			A3.1.5.2 Subsoil Drainage Materials a) Pipes	The pipes shall be uPVC, 160mm ID, perforated or unperforated as per Dwg No: KSIA-CIV-DP-021
		A3.1.7	EXECUTION OF THE WORKS	
			A3.1.7.5 Manholes, outlet structures and cleaning eyes	Refer to SANRAL Typical Detail for Subsurface Drainage, Dwg. No.'s KSIA-CIV-DP-021 to KSIA-CIV-DP-023 and project specific subsurface drainage.
	A3.2		CULVERTS	
		A3.2.7	EXECUTION OF THE WORKS	
			A3.2.7.4 Unsuitable founding conditions	Where the in-situ material is found to be unsuitable, it shall be removed to a depth as instructed by the engineer and then replaced with an approved selected material compacted to at least 93% Max. Dry Density (MDD) in layers not exceeding 150mm thickness

TABLE A4.1-4: EARTHWORKS AND PAVEMENT LAYERS: MATERIALS

CH	SEC	CL	SUB-CLAUSE	SPECIFICATION DATA
4			EARTHWORKS AND PAVEMENT LAYERS: MATERIALS	
	A4.1		BORROW MATERIALS	
		A4.1.3	GENERAL	
			A4.1.3.1 Employer identified borrow pits and quarries	No borrow pits identified by Employer
		A4.1.7	EXECUTION OF WORKS	
			A4.1.7.3 Stockpiles	Part time Stock-pile Controller required: Senior General Foreman with min. 10 years' experience in borrow pit and quarry operations
	A4.2		CUT MATERIALS	
		A4.2.7	EXECUTION OF WORKS	
			A4.2.7.1 Excavation operations	
			a) Control at the cuttings, designated excavations and box cuts	Part time Materials Manager required: Senior General Foreman with min. 10 years' experience in earthworks operations

CH	SEC	CL	SUB-CLAUSE	SPECIFICATION DATA
			i) Excavation of material in box cuts	Refer to Typical Cross Sections, Dwg No: KSIA-CIV-LL-016 - KSIA-CIV-CS-018
	A4.3		EXISTING ROAD MATERIALS	
		A4.3.7	EXECUTION OF THE WORKS	
			A4.3.7.4 Milling	Engineer to instruct remedial measures for loose local areas
	A4.4		COMMERCIAL MATERIALS	
		A4.4.5	MATERIALS	
			A4.4.5.1 Earthworks and pavement layer materials	Material must be stockpiled separately with clear signage indicating for use

TABLE A5.1-3: EARTHWORKS AND PAVEMENT LAYERS: CONSTRUCTION

CH	SEC	CL	SUB-CLAUSE	SPECIFICATION DATA
5			EARTHWORKS AND PAVEMENT LAYERS: CONSTRUCTION	
	A5.1		ROADBED	
		A5.1.3	GENERAL	
			A5.1.3.1 Roadbed material Investigation	Refer to Scope of Work description
		A5.1.5	MATERIALS	
			A5.1.5.2 Topsoil	To be obtained from construction site/ work areas and/or borrow pits or commercial sources, if required
		A5.1.7	EXECUTION OF WORKS	
			A5.1.7.1 Clearing and grubbing	Material obtained from clearing and grubbing to be removed from site
			A5.1.7.2 Removal and conservation of topsoil from roadbed	Topsoil shall be removed to either windrows alongside the construction area or to stockpile. Where ordered by the engineer, any topsoil that shall be required for the topsoiling, but which cannot be accommodated within the construction site, shall be loaded and hauled to the designated stockpile area where it shall be placed in temporary stockpiles for later use in the rehabilitation of the site affected by construction activities
			A5.1.7.3 Normal roadbed treatment	
			b) Removal of unsuitable roadbed material	To be spoiled in approved areas of borrow pits
			c) Percentage of Max Dry density (MDD)	All roadbed materials shall be sacrificed to a depth of at least 150mm and compacted to 93% of MDD

CH	SEC	CL	SUB-CLAUSE	SPECIFICATION DATA
			g) Inactive clay and normal clay	Should such materials be encountered, it must be removed as per Standard Specifications
			h) Active Clay	Should such materials be encountered, it must be removed as per Standard Specifications
			<i>(ii) Alternative 2 – Roadbed construction by removal of active clay</i>	Active clay shall be removed to the bottom of the clay layer, or to a min. depth of 750mm below NGL. The removed material shall be replaced with compliant material as per the detailed drawings.
			i) Construction of a pioneer layer	As specified and instructed by the Engineer
	A5.3		ROAD PAVEMENT LAYERS	
		A5.3.3	GENERAL	
			A5.3.3.4 Compaction of pavement layer material	Refer to pavement specifications on Typical Cross Sections, Dwg No: KSIA-CIV-TX-004A - KSIA-CIV-PL-006
			A5.3.3.7 Joints between pavement layers	Joints in lower layers to be located as specified in the COTO standard specifications
			b) Longitudinal joints	Saw cut depth to be determined based on layer thicknesses, or as instructed by the Engineer
			A5.3.3.8 Pavement Layer Drainage	No subsoil drainage specified in pavement layers
		A5.3.5	MATERIALS	
			A5.3.5.2 Pavement Layer thickness and compaction requirements	
			a) Pavement layer thickness requirements	Refer to pavement specifications on Typical Cross Sections, Dwg No: KSIA-CIV-TX-004A - KSIA-CIV-PL-006
			c) Crushed stone pavement layer compaction requirements (G1 to G4A and G5A material)	Compacted to 88% of Apparent Density

TABLE A8.1: PRETREATMENT AND REPAIR OF EXISTING LAYERS

CH	SEC	CL	SUB-CLAUSE	SPECIFICATION DATA
8			PRETREATMENT AND REPAIR OF EXISTING LAYERS	
	A8.1		PRIME COAT	
		A8.1.3	GENERAL	
			A8.1.3.1 Weather limitations	The limiting moisture contents for treated layers before priming shall be less than 50% of OMC.

CH	SEC	CL	SUB-CLAUSE	SPECIFICATION DATA
		A8.1.5	MATERIALS	
			PA8.1.5.1 Bituminous material	The priming material shall be one of the following as specified in Part C: Measurement and Payment: MC-30 cut-back bitumen <u>or</u> Inverted bitumen emulsion.
		A8.1.7	EXECUTION OF THE WORKS	
			A8.1.7.5 Opening to traffic	A blinding layer is not specified on the drawings, but will be directed by the Engineer where required.

TABLE A9.1: ASPHALT LAYERS

CH	SEC	CL	SUB-CLAUSE	SPECIFICATION DATA
9			ASPHALT LAYERS	
	A9.1		ASPHALT LAYERS	
		A9.1.2	DEFINITIONS	
			Asphalt mix types	Continuously Graded Surfacing (A-P1 Modified Binder (PG 64H-16) and level 3 design)(NMPS 14mm) Continuously Graded Base (A-E2 Modified Binder and level 2 design)(NMPS 14mm) High Modulus Asphalt (EME II) (10-20 Penetration Grade Bitumen and level of design 3 -SABITA Manual 33)(NMPS 14mm)
			Aggregate	Refer to Standard Specifications.
		A9.1.3	GENERAL	
			A9.1.3.1 Nominal mix proportions and application rates	<u>Asphalt wearing course at Taxiway Bravo:</u> PG64H-16.
		A9.1.4	DESIGN BY THE CONTRACTOR	
			A9.1.4.1 Mix Designs	Continuously Graded Surfacing (A-P1 Modified Binder (PG 64H-16) and level 3 design)(NMPS 14mm) Continuously Graded Base (A-E2 Modified Binder and level 2 design)(NMPS 14mm) High Modulus Asphalt (EME II) (10-20 Penetration Grade Bitumen and level of design 3 -SABITA Manual 33)(NMPS 14mm)
			A9.1.4.2 Mix design requirements	Continuously Graded Surfacing (A-P1 Modified Binder (PG 64H-16) and level 3 design)(NMPS 14mm) Continuously Graded Base (A-E2 Modified Binder and level 2 design)(NMPS 14mm)

CH	SEC	CL	SUB-CLAUSE	SPECIFICATION DATA
				High Modulus Asphalt (EME II) (10-20 Penetration Grade Bitumen and level of design 3 -SABITA Manual 33)(NMPS 14mm)
		A9.1.5	MATERIALS	
			A9.1.5.2 Bituminous binders for asphalt mixes	Continuously Graded Surfacing (A-P1 Modified Binder (PG 64H-16) and level 3 design)(NMPS 14mm) Continuously Graded Base (A-E2 Modified Binder and level 2 design)(NMPS 14mm) High Modulus Asphalt (EME II) (10-20 Penetration Grade Bitumen and level of design 3 -SABITA Manual 33)(NMPS 14mm)
			A9.1.5.5 Fillers	Filler shall be hydrated lime.
			A9.1.5.8 Mix properties	Continuously Graded Surfacing (A-P1 Modified Binder (PG 64H-16) and level 3 design)(NMPS 14mm) Continuously Graded Base (A-E2 Modified Binder and level 2 design)(NMPS 14mm) High Modulus Asphalt (EME II) (10-20 Penetration Grade Bitumen and level of design 3 -SABITA Manual 33)(NMPS 14mm)
		A9.1.7	EXECUTION OF THE WORKS	
			A9.1.7.8 Applying rolled-in chippings	Rolled-in chippings will not be used.
		A9.1.8	WORKMANSHIP	
			A9.1.8.8 Sampling	
			b) Coring of completed layers	The Contractor shall provide suitable coring machines capable of cutting 100mm or 150mm diameter cores from the completed asphalt layers.

TABLE A11.7-8: ANCILLARY ROAD WORKS

CH	SEC	CL	SUB-CLAUSE	SPECIFICATION DATA																																							
11			ANCILLARY ROAD WORKS																																								
	A11.7		ROAD MARKINGS AND ROAD STUDS																																								
		A11.7.5	MATERIALS																																								
			PA11.7.5.2 Materials																																								
			a) Marking materials																																								
			(ii) Retro-reflective road marking	Water-borne road marking paint to be used, to be approved by ACSA.																																							
			(iii) Thermoplastic road marking material	Thermoplastic road marking paint to be applied at end of defects liability period, to be approved by ACSA.																																							
	A11.8		LANDSCAPING AND PLANTING PLANTS																																								
		A11.8.5	MATERIALS																																								
			A11.8.5.2 Materials																																								
			d) Grass seeds	The grass seed mixture shall be as follows (final mixture to be supplied and approved by ACSA):<table><thead><tr><th>Latin Name</th><th>English Name</th><th>kg/ha</th></tr></thead><tbody><tr><td>Eragrostis tef</td><td>Teff</td><td>2,0</td></tr><tr><td>Digitaria eriantha</td><td>Finger grass</td><td>5,0</td></tr><tr><td>Chloris guyana</td><td>Rhodes grass</td><td>4,0</td></tr><tr><td>Cenchrus ciliaris</td><td>Blue Buffalo grass</td><td>4,0</td></tr><tr><td>Cynodon dactylon</td><td>Couch grass</td><td>7,0</td></tr><tr><td>Aristada congesta</td><td>Three lawn grass</td><td>2,5</td></tr><tr><td>Melinis repens</td><td>Natal red top</td><td>2,5</td></tr><tr><td>Panicum coloratum</td><td>White Buffalo grass</td><td>2,5</td></tr><tr><td>Andropogum eucomus</td><td>Snowflake grass</td><td>2,5</td></tr><tr><td>Imperata cylindrica</td><td>Cottonwool grass</td><td>2,5</td></tr><tr><td></td><td>Others to be added</td><td>0,5</td></tr><tr><td colspan="2">Total</td><td>35,0</td></tr></tbody></table>	Latin Name	English Name	kg/ha	Eragrostis tef	Teff	2,0	Digitaria eriantha	Finger grass	5,0	Chloris guyana	Rhodes grass	4,0	Cenchrus ciliaris	Blue Buffalo grass	4,0	Cynodon dactylon	Couch grass	7,0	Aristada congesta	Three lawn grass	2,5	Melinis repens	Natal red top	2,5	Panicum coloratum	White Buffalo grass	2,5	Andropogum eucomus	Snowflake grass	2,5	Imperata cylindrica	Cottonwool grass	2,5		Others to be added	0,5	Total		35,0
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	Others to be added	0,5																																									
Total		35,0																																									

TABLE A20.1: TABLE A20.1: QUALITY ASSURANCE

CH	SEC	CL	SUB-CLAUSE	SPECIFICATION DATA
20			QUALITY ASSURANCE	
	A20.1		TESTING MATERIALS AND JUDGEMENT OF WORKMANSHIP	
		A20.1.3	TESTING METHODS	
			A20.1.3.3 The Costs of Testing	
			a) Material and workmanship for quality control	Testing will be undertaken by an independent commercial laboratory as indicated under A20.1.3.3 a)(i)3.

AIRPORTS COMPANY SOUTH AFRICA

KING SHAKA INTERNATIONAL AIRPORT

TENDER NO: KSIA7806/2025/RFP

**PROCUREMENT OF A CIDB GRADE 9 CE CONTRACTOR THE COMPLETION OF BRAVO TAXIWAY
EXTENSION AT KING SHAKA INTERNATIONAL AIRPORT FOR A PERIOD OF 12 MONTHS**

C3.6B: PARTICULAR (PROJECT) SPECIFICATIONS: ELECTRICAL

Notes to Tenderer:

1. In the event of a discrepancy between the Specifications (including the Project Specifications) and the drawings and / or the Bill of Quantities, the discrepancy must be brought to the Employer's Agent attention to be resolved.

PART I
SCOPE OF WORKS

PROCUREMENT OF A CIDB GRADE 9 CE CONTRACTOR THE COMPLETION OF BRAVO TAXIWAY EXTENSION AT KING SHAKA INTERNATIONAL AIRPORT FOR A PERIOD OF 12 MONTHS

C3.6C SCOPE OF WORKS

PART A: GENERAL

A1 MISCELLANEOUS

The Standard Specifications that form part of this Contract have been written to cover all phases of work normally required for road contracts, and may therefore cover items of work not applicable to this particular Contract.

The Project Specifications form an integral part of the Contract Documents, supplement the Standard Specifications, and take precedence in the event of discrepancies with the Standard Specifications, the Schedule of Quantities or the Drawings.

A2 PROJECT DESCRIPTION

A2.1 Employer's Objectives

The main objective of the employer is the construction of erosion protection works at the drainage structures.

A2.2 General

This project entails the installation of taxiway and Apron lighting with electrical reticulation, including Back-up generators. The upgrade requirements will largely match the existing infrastructure.

A2.3 Site location

The site is situated at the King Shaka International Airport next to the N2 Coastal highway, La Mercy, Kwa-Zulu Natal, South Africa.

A2.4 Airport works

The Airport works included in this project consist mainly of the following:

- the installation of new CCRs, cabling, cross/hold bar lights, lead-on lights, runway guard lights, stop bar lights, taxiway lights and signage;
- the removal and replacement of the existing runway and taxiway lights;
- the installation of the apron lighting masts and luminaries;

- the testing and commissioning of the AGL systems.
- the testing and commission of the generators and mini-sub on the Apron

A2.5 Maintenance works

The Contractor shall be responsible for maintaining the entire length of road reserve, from the date of handing over of the site until the date of issue of the certificate of completion of the Works.

Once the certificate of completion of the Works has been issued the responsibility for normal maintenance of the road (e.g. collection of litter, clearing of drains, repair of road signs damaged by the public, etc.) shall revert back to the District Roads Engineer. The Contractor shall, however, still be responsible for the contractual maintenance during the Defects Liability Period.

A2.7 Accommodation of air traffic

A2.7.1 General

The accommodation of air traffic along the route is of utmost importance with regard to airport user safety as well as being able to incorporate efficient construction methods.

Actual accommodation of traffic proposals to be used on the project shall be submitted timeously for approval of both the air traffic control and the Engineer. Particular attention shall be given to accesses and intersecting runways and taxiways.

A3 DRAWINGS

Refer to Volume 4 for tender drawings.

POWER SUPPLY AND OTHER SERVICES

- A4** The Contractor shall make his own arrangements concerning the supply of electrical power and all other services. No direct payment will be made for the provision of electrical and other services. The cost thereof shall be deemed to be included in the rates and amounts tendered for the various items of work for which these services are required.

A5 CONSTRUCTION IN CONFINED AREAS

It may be necessary for the Contractor to work within confined areas. No additional payment will be made for work done in restricted areas. In certain places the width of the fill material and pavement layers may decrease to zero and the working space may be confined. The method of construction in these confined areas largely depends on the Contractor's constructional plant.

However, the Contractor must note that measurement and payment will be in accordance with the specified cross-sections and dimensions only, irrespective of the method used for achieving these cross-sections and dimensions and

that the tendered rates and amounts shall include full compensation for all special equipment and construction methods and for all difficulties encountered when working in confined areas and narrow widths, and at or around obstructions, and that no extra payment will be made nor will any claim for additional payment be considered in such cases.

A6 CONTRACTOR'S CAMP SITE

A6.1 Establishment

The establishment of all labour, plant and materials on site is the responsibility of the Contractor and all arrangements in this respect are the Contractors' responsibility; however:

- Provision has been made in the Schedule of Quantities for the Contractor to tender for his independent establishment on site;
- Base camp(s) established by the Contractor for his use must be approved by the Engineer before the Contract begins and this approval must be obtained in writing but must also meet the approval of the local authorities, headmen or residents' associations, as well as the Environmental Management Plan with regard to batching plants, bitumen storage areas and plant maintenance areas.

A6.2 Communications

The Contractor shall provide and maintain a continuous means of on-site communication between his site supervision staff (i.e. the people responsible for the day to day running of the Contract) and the staff of the Engineer's Representative. The Contractor shall be responsible to pay the Engineer's Representative the cost of cell phone calls made in connection with contract administration and rental. The provision and use of cellular phones for the Contractor's personnel will be for his own cost.

A7 SECURITY

The Contractor shall be responsible for the security of his personnel and constructional plant on and around the site of the works and for the security of his camp, and no claims in this regard will be considered by the Employer. The Contractor shall also be responsible for the security of the areas around the Engineer's offices.

A8 ADDITIONAL REQUIREMENTS FOR CONSTRUCTION ACTIVITIES

A8.1 Environmental Management

The Contractor shall be responsible for implementing and managing an Environmental Management Plan in terms of Part H of the Project specifications.

The Contractor's authorised agent shall report to the Engineer regarding compliance with the conditions as stipulated in the Environmental Management Plan.

The Contractor shall take the utmost care to minimise the impact of his establishment and other construction activities on the environment and shall adhere to the requirements as set out in Part G of the Project Specifications. The Contractor shall prepare a detailed Method Statement to the Engineer detailing his construction activities and what measures will be implemented to prevent the pollution of streams, rivers and countryside through the spilling of fuels, bituminous binders, sewage from the temporary toilets and other deleterious materials. Where in the opinion of the Engineer, the Contractor has not adhered to these requirements, the Contractor shall rectify the damage at his own cost and to the satisfaction of the Engineer.

A9 WATER FOR CONSTRUCTION PURPOSES

The Contract will be undertaken in an arid area with scarce water resources. The Contractor must make adequate provision in his Tender for all negotiations and procurement of water for construction activities, and all related costs will be deemed to be included in his tendered rates.

A10 TEMPORARY LATRINES

The Contractor shall provide sufficient portable chemical latrine units for the use of his employees. Furthermore, the Contractor shall also provide a portable chemical latrine unit at each temporary traffic control facility. He shall be entirely responsible for enforcing their use and for maintaining such latrines in a clean, orderly and sanitary condition to the satisfaction of the Engineer and the Employer. Latrines shall be positioned within walking distance from wherever employees or labourers are employed on the Works.

Where required, latrines shall be provided at the rate of one for ten persons and where applicable, the Contractor shall make his own arrangements and pay all charges for the removal of sewage.

No separate payment shall be made for this requirement and the costs thereof shall be deemed to be included in the rates tendered for the Contractor's time-related obligations.

A11 TRAINING (ATC)

Technical skills, generic and management skills training of labour shall not be required on this Contract.

A12 USE OF LOCAL RESOURCES

It is the intention that this Contract should make maximum use, where practical, of the local labour force that is presently under-employed. To this end the Contractor shall limit the utilisation on the Contract of non-local employees to that of key personnel only and to employ and train local labour to the extent necessary for the execution and completion of this Contract with particular reference to excavation works.

A13 AIRPORT MANAGEMENT AND AIR TRAFFIC CONTROL

The Airport Manager (AM) and the Air Traffic Controller (ATC) are ultimately responsible for the safe and efficient operation of the airport.

The AM or his authorised representative will in his official capacity have authority to give the Contractor verbal or written orders on matters concerning the operation, security or safety of the airport and the Contractor shall, after having informed the Engineer or the orders, carry out the instructions as if issued by the Engineer.

The ATC is responsible for the safe movement of all aircraft traffic, both in the air and whilst on the ground. The ATC shall at all times have absolute authority regarding the movement of any construction personnel, vehicles or equipment, where such movement takes place within the obstruction-free areas of existing facilities, or may affect the safe movement of the air traffic, and his instructions shall be implicitly obeyed. The ATC's decision regarding the acceptability and programming of the Contractor's activities within the abovementioned areas shall be taken into account and may result in night work where considered necessary.

All liaison with the AM or ATC shall be arranged through the Engineer.

A14 RADIO COMMUNICATION ON THE AIRPORT

If required, the Contractor shall establish an acceptable radio communication system on the airport. Such a system must be approved by the ATC to ensure that no interference with normal aeronautical control communication occurs.

Radio communication between the AM and the Contractor will be effected by means of radios. The Contractor shall provide VHF radio equipment for his personnel for communication with the AM. The Contractor's personnel shall have to complete a basic course for radio operators before sets may be used at the frequency provided. The cost for providing these sets and the maintenance thereof will be considered to be included in the tendered rates.

A15 AIRPORT SECURITY

The Contractor shall ensure that the security of the airport is maintained wherever it may be affected by his operations under the Contract. He shall be responsible for the observance of all security regulations and related requirements, both by his employees, subcontractors and their employees, as well as by his suppliers.

Entry into the security area, whether for personnel, vehicles or self-propelled construction equipment, shall be subject to the issue of access permits by the airport authorities. All personnel or vehicle permits shall be displayed at all times while such person or vehicle is within the security area. Permits may be issued to grant access to a designated area only and it shall be the Contractor's responsibility to exercise the necessary control on site in order to prevent trespassing by personnel or vehicles in this regard. This applies more specifically to suppliers, subcontractors and other parties not acquainted with the airport. The Contractor shall pay all costs involved in the issue of such permits.

The failure of the Contractor to comply with these or other security regulations and requirements, shall be sufficient reason to cancel the Contractor's access permits and/or terminate all construction activities until such shortcomings or

breaches of security have been rectified, and the Contractor shall have no right to claim for any resulting delays, standing time or losses whatsoever.

A16 *FEATURES REQUIRING SPECIAL ATTENTION*

A16.1 *Safety of the workmen and access to works*

The entire works shall be carried out in accordance with the requirements of all the relevant Government Acts and Regulations.

The Contractor shall provide suitable and safe access to all parts of the works as may be required for construction purposes or for inspection by the Engineer.

The Contractor shall take all precautions to ensure the safety of his employees and other persons on the site of the works. Under no circumstances shall the contractor work on a live installation without an approved "Permit to Work" issued by the relevant airport authority.

All precautions shall be taken to protect workmen from falling material and other dangers whilst carrying out duties. All persons working, inspecting or supervising in places where falling material could be encountered, shall be provided by the contractor with a hard hat of a type approved by the Inspector of Mines, and the use of same shall be strictly enforced.

Trenches shall in every way be made and kept safe for persons working therein.

The Contractor shall observe proper and adequate safety measures and precautions on the site at all times. Where adequate safety measures and precautions are not being observed, the Engineer may order the Contractor to comply with minimum safety requirements at the Contractor's expense, and compliance with such an order will not absolve the Contractor from any of his responsibilities and obligations under the contract.

The Contractor shall provide a properly equipped first-aid box which shall be accessible at all times.

A16.2 *Working hours*

The Contractor must note that the airport will be open for business as normal. The Contractor is advised that he will be working close to a runway and taxiways which may be in use daily and that he may have to arrange his daily programme to accommodate the disruptions which may be caused by the use of this taxiway by aircraft.

A17 *MOVEMENT ON THE AIRPORT*

The Contractor shall control all movement of his personnel, vehicles and equipment according to the stipulations laid down by the ATC, or specified in the documents or indicated on the drawings. In order to achieve proper control over all movements on site, certain areas, routes or corridors shall be clearly demarcated as indicated on the drawings or

instructed by the Engineer. Such demarcations shall be made prior to the commencement of any construction activities in any particular area, and will have to be moved to new positions as the requirements change during construction of the works.

Movements and operations within the abovementioned demarcated zones, shall not normally be subject to any restrictions from the ATC. Any access, haul or construction routes shall, however, be fixed after consultation with the Engineer.

The crossing of any operational facility on the airport will require special control by the ATC or the airport manager and will be limited to pre-determined points as indicated on the drawings or instructed by the Engineer. The required controls may include any of the following:

- (i) Unrestricted crossing by the Contractor linked with a system of pre-warnings that the facility will be required for airport use within a certain period after notification;
- (ii) Flagmen at crossing points, allowing movements across the facility whenever aircraft traffic permits;
- (iii) Radio-controlled crossing points, where movement across the facility may only take place after receiving clearance from the ATC.

A18 AIRSIDE VEHICLE CONTROL SYSTEM

A18.2 Responsibilities of the airport management

The AM will issue the necessary application forms to those who apply to the airport management for an airside vehicle permit and/or an Airport Security Permit and will decide, on receipt of the completed forms, whether or not to issue the permits.

The airport management may at any time withdraw or suspend an Airside Vehicle Permit or any Airport Security Permit.

A18.1 Responsibilities of the Contractor

Contractors wishing to operate vehicles on the airside without the airport management's escort, shall make the necessary applications in the manner set out below for each intended vehicle and driver. As a condition of approval of an application for an Airside Vehicle Permit, the company shall ensure that all vehicles and drivers are covered by the Contract Works, Public Liability and SASRIA Special Risks insurances.

When a vehicle is no longer required for airside use, the Contractor must, upon removing it from airside use, remove and return the Airside Vehicle Permit to the airport manager.

The Contractor shall immediately report to the AM all notifiable accidents and shall ensure that arrangements are in place for the rapid removal and/or repair of its vehicles should they become immobilized on movement areas.

A18.3 Airside vehicle permit

Applicants are to demonstrate an operational need for the vehicle to enter the airside, and shall include the following details of the vehicle:

- name and address of the owner
- make and model
- type of work to be undertaken
- proposed areas of operation
- certificate of provincial vehicle registration (or reasons why the vehicle is not registered)
- any special features.

Vehicles are to display the current Airside Vehicle Permit on the right-hand side of the windscreen or in a holder.

Vehicles shall be registered, or if not registered, shall meet the mechanical and roadworthiness requirements of the relevant provincial authority. In the case of specialist vehicles and equipment, the recognized industry standards are to be met.

Vehicles wishing to operate on the manoeuvring areas of airports must be escorted by an appropriate radio-equipped vehicle of the airport management.

A18.4 Authority to drive airside

The authority to drive airside is coupled to the Airside Vehicle Permit.

The Contractor certifies by applying for an Airside Vehicle Permit that the proposed driver:

- has an operational need to drive on the airside;
- holds a current provincial driver's licence, which is appropriately endorsed with an official licence for the specific type(s) of vehicle/equipment to be operated and is able to operate the vehicle(s) concerned in a competent and safe manner;
- is proficient with the terminology used to describe the airside and is familiar with the airport layout relevant to his/her driving duties, and
- is conversant with the applicable contents of Part A of the Project Specifications.

Except as otherwise specifically authorised, no person shall drive a vehicle on airside unless the vehicle has a current Airside Vehicle Permit which is valid for that area of the airport.

A19 RULES FOR DRIVING AIRSIDE

A driver wishing to operate vehicle(s) on airside areas of Mafikeng Airport shall:

- wear a valid Airport Security Permit at all times when in a restricted area;
- only operate a vehicle displaying a current Airside Vehicle Permit;
- produce the Airport Security Permit and Airside Vehicle Permit on demand by the AM; • comply at all times with any instruction given by the AM; and
- only operate a vehicle within the area of operation as approved by the AM. An escort must be arranged by the AM if the driver must operate beyond the approved areas.

All drivers shall:

- give way to manoeuvring aircraft or an aircraft under tow (operation of the red anticollision beacons may indicate that aircraft engines have started or that push-back or towing of the aircraft is about to commence or is underway);
- obey speed limits, unless otherwise indicated, speed limits are:
 - on delineated service roads: 30 km/h
 - on perimeter roads: 60 km/h
- obey all other road signs and markings installed around the airport (drivers shall be aware that in some places markings are without the associated road signs);
- follow the service roads (apron service roads are delineated by white staggered lines) provided for vehicular movement;
- make sure that loose materials, equipment and garbage carried on a vehicle are covered adequately to prevent spillage and, where spillage does occur, clean it immediately;
- when operating a vehicle at night, or in periods of poor visibility while moving on the movement area, ensure that headlights are dipped and tail lights are displayed as for normal night driving;
- park vehicles and equipment only in areas specified by the AM (areas marked for steps that are vacant may be utilised by vehicles associated with the serving of aircraft in the period half an hour before to half an hour after arrival or departure of aircraft); and
- take extreme care when overtaking any other vehicle on airside service roads.

Drivers shall not:

- drive on taxiways or runways unless in radio communication with Air Traffic Control or under escort by an Airport Authority vehicle;
- operate a vehicle while under the influence of drugs or alcohol;
- operate a vehicle closer than 1,5 metre to an aircraft; and
- drive a vehicle where passengers are walking to or from an aircraft.

A20 ACCIDENTS AND INCIDENTS

Contractors shall report to the AM every accident involving vehicles or plant under their control where the accident has involved injury or damage to another vehicle, aircraft, building or airport property, or where there is injury to the driver(s) or passenger(s) in the vehicle. The prescribed accident report forms shall be used for this purpose.

Distinction will be made between the following types of accidents:

- (i) Accidents of minor nature that do not have effect on the operational efficiency of the involved vehicles, building or airport property
- (ii) Accidents causing property damage affecting the operational efficiency of vehicles or infrastructure or causing injury to persons travelling in vehicles.

Accidents in the first category must be reported to the AM within 24 hours. Accidents in the second category must be reported to the AM immediately and the South African Police shall be called to the accident site to investigate and report on the causes of the accident. Where possible neither the driver, the passengers or vehicles should leave the accident site before the arrival of the police.

The parties involved must ensure that adequate arrangements are made for the rapid removal or repair of immobilised vehicles on movement areas.

All accidents/incidents, irrespective of the seriousness thereof, affecting aircraft must be reported immediately to the AM.

The Airport Manager reserves the right to:

- withdraw any airport security permit
- withdraw any airside vehicle permit, should it be considered necessary
- tow away vehicles when parked incorrectly.

A21 ADDITIONAL REQUIREMENTS REGARDING CONSTRUCTION ACTIVITIES

A21.1 Existing surfaces

The surfaces of existing facilities at and adjacent to places where the Contractor is working or crossing, shall be absolutely clean whenever they are used by aircraft. This will require the presence of a cleaning team to remove all debris, stones or other material from the surfaces. The Contractor shall be responsible for any damage to aircraft or other equipment as a result of failure to comply with this requirement.

A21.2 Barricades and markings

The Contractor shall erect, maintain, move and finally remove temporary barriers, fences and markings provided by the Employer, all as prescribed by the airport authorities or as shown on the drawings.

A21.3 Dust and pollution

The Contractor shall control dust in all working areas to the satisfaction of the airport authorities. No pollution from machines, batching plants, mixers, workshops or other sources (such as the breaking up of existing work) will be tolerated, especially on and near the aprons.

The Contractor shall keep the entire site of the works, including his own camp site, in a neat and clean condition to the satisfaction of the airport authorities and all costs incurred by the Contractor will be deemed to be included in the rates tendered by the Contractor for the control of dust and pollution.

A22 UNFORESEEN DELAYS DUE TO ACTION BY AIRPORT AUTHORITIES

The Contractor shall note that, at any time during the Contract period, the arrival or departure of any aircraft may be delayed or brought forward, and the Contractor may be required to adapt the programming of his work accordingly.

No claims will be entertained or additional payment made for disruption of the Contractor's operations due to these changes in aircraft schedules.

PART B: PROJECT SPECIFICATIONS

CONTENTS

- 1. Scope
- 2. Electrical Infrastructure
- 3. Applicable Standards
- 4. Technical Requirements
- 5. Approval Of Material And Equipment
- 6. Guarantee
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- 8. Measurement And Payment

1. SCOPE

This specification covers the supply, delivery, installing, testing and commissioning of the following material and equipment for the upgrading of the remote apron stands and Bravo taxiway extension, in terms of electrical airfield ground lighting (AGL) infrastructure and apron stand electrical inclusions at the King Shaka Airport:

- Runway edge lights for the main runway;
- Taxiway lighting for all the taxiways;
- Constant current regulators (CCR's) for the airfield lighting circuits;
- Stop Bar lights for taxiways
- Airfield lighting cables and circuits;
- Upgrading of existing control and monitoring system and fibre optic control cables to include all changes;
- Apron floodlighting

The contractor must have experience in airport works specifically AGL installations, they shall furthermore be responsible for removing all existing light fittings and other equipment prior to commencing with construction works. All material and equipment shall be handed over to the designated maintenance personnel at the airport who shall sign receipt for the material and equipment. The contractor will be held responsible for any material not handed over to the maintenance personnel and which cannot be accounted for.

The contractor will supply and install the cable ducts and manholes, cut slots into asphalt and repair these surfaces for installation of the airfield lighting cable circuits if required. The contractor shall supply and where specified install all shallow bases for inset fittings, ducts for secondary cables and other material required to mount the light fittings supplied.

The contractor shall furthermore be responsible for undertaking all civil work required for the installation of airfield lighting, plinths, and core drilling for galvanised steel cans.

The contractor shall only undertake excavations where specified or where instructed to in writing by the engineer. The contractor shall therefore ensure the sufficiency of his excavation rates.

2. ELECTRICAL INFRASTRUCTURE

2.1 Electrical Reticulation Network

2.1.1 Medium Voltage Cable

The medium voltage cables have been supplied and installed, this comprises 150mm², 3-core copper conductor, PILC insulation, steel wire amounted, PVC service, 11/11kV, Table 26 cable. The cables shall be confirmed to be connected to the existing (and proposed extension thereof) 11kV underground electrical network at the miniature substations (mini subs) within the head of stand area.

2.1.2 Low Voltage Distribution Cables

Low voltage cables are to be used to supply electrical power to the following infrastructure:

- Apron lighting masts – from the mini substation to the masts: 35mm², 4-core copper cables.
- Apron signage – from the kiosk at the masts to the signs: 10mm², 3-core copper cables.

2.1.3 Miniature Substations

Miniature substations are positioned on each of the two new stands to supply the apron lighting, ground power unit infrastructure and other electrical systems on the stand. The substations are to be 500kVA 11000/420/242 volt and are manufactured to comply with ACSA specifications and equipped with the following low voltage equipment:

- 1 x 800 ampere, 25 kA, 3 pole circuit breaker – main;
- 3 x 800/5A current transformers;
- 3 x 800 A instantaneous and maximum demand ammeters;
- 5 x 160 A, 20 kA circuit breakers;
- 1 x 125 A, 20 kA circuit breakers; and
- Floodlight (streetlight) control as required by ACSA.
- Low Voltage Distribution Kiosks

Stainless steel metering kiosks (ACSA specification to match existing on airport) are installed on site, confirmation of the kiosks are specified as part of the design. The kiosks are to be positioned on each of the proposed stands close to the floodlight masts (2m away with doors opening parallel to the mast in order to allow unrestricted access to the kiosk).

The following needs to be confirmed on site; each kiosk will consist of:

- Two door kiosk, 3CR12, 2.0mm, with hinge lockable doors in the front and rear; ▪ Front of kiosks is to accommodate:
 - All outgoing feeder cables to light mast;
 - 9 x 30 Ampere single pole 10kA curve 1 circuit breakers;
 - 3 x 20 Ampere single pole 10kA curve 1 circuit breakers;

- Control gear for high mast luminaires;
 - 4 pole, 25kA, surge arrestors; and
 - K-Clamp struts to secure the LV cables.
- Internal wiring;
 - Front of kiosks is to accommodate:
 - All incoming supply cables;
 - Busbars; and
 - K-Clamp struts to secure the LV cables.

2.2 Apron Electrical

The proposed apron electrical infrastructure includes:

- Apron floodlighting;
- Stand number indicator boards (SNIBs);
- Miniature substations;
- Medium and low voltage cables;
- Illuminated signage for the connecting/access taxiways;
- Taxiway edge lighting for the connecting/access taxiways;
- Airfield lighting cables and circuits;
- Control and monitoring system upgrade; and
- Constant current regulators (CCRs) for the airfield lighting circuits.

2.3 Aerodrome lighting

The existing airfield lighting installation which is relevant to this contract comprises of the following:

- (a) Stop Bar lighting;
- (b) Lead On lighting;
- (c) Runway Guard lighting;
- (d) Runway Edge lighting;
- (e) Taxiway lighting;

2.4 Constant Current Regulators (CCRs)

The following CCRs are installed at the airport:

- (a) Eight units to be installed in the Substations AS1 and AS4.

2.5 Airfield lighting cables

The airfield lighting cables around the main runway are installed in sleeves with concrete manholes at each light position.

2.6 Control and monitoring system

The existing control and monitoring system comprises of a fibre optic cable link between the tower and the control room and a Video Display Unit (VDU) installed in the control tower.

3. APPLICABLE STANDARDS

The following standard specification shall be applicable:

- (a) ICAO Annex 14 titled Aerodromes, Volume I, Aerodrome Design and Operation, Seventh Edition, July 2016;
- (b) ICAO Aerodrome Design Manual, Part 4 titled Visual Aids, Volume I, Fourth Edition, July 2004;
- (c) ICAO, Annex 14 Volume I, Chapter 5, Section 5.3 – Lights;

4. TECHNICAL REQUIREMENTS

4.1 Taxiway Edge Lights

New low intensity blue lights shall be installed on the taxiway edge. The taxiway lights shall be installed on the tarred shoulder of the taxiway. The lights shall be omni-directional, elevated lights. The lamp shall be of the LED type.

The lights and the installation thereof shall comply with the requirements of *ICAO, Annex 14 Volume I, Chapter 5, Sections 5.3.16.1 to 5.3.16.6.* and FAA: L-861T AC 150/5345-46 and FAA: L-852T AC 150/5345-46 current editions.

4.2 Runway Edge Lights on the main runway

The proposed taxiway link for Bravo on to the existing runway will require a single elevated Omni-directional runway edge light (white) to be replaced with an inset, bi-directional (white) light.

The lights and the installation thereof shall furthermore comply with the requirements of ICAO, Annex 14 Volume I, Chapter 5, Sections 5.3.9.1 to 5.3.9.10.

4.3 Stop Bar Lights

The proposed taxiway link for Bravo on to the existing runway will require a single elevated Omni-directional runway Stop Bars. A single stop bar will be provided as part of the Bravo taxiway extension. This will be positioned to coincide with the runway hold position marking, which is located at a 107.5m offset from the runway centreline.

The lights and the installation thereof shall furthermore comply with the requirements of ICAO, Annex 14 Volume I, Chapter 5.

4.4 Intermediate Holding Position Lights (Not Applicable)

The proposed intersection between the Bravo and Alpha Taxiway there will be three fixed uni-directional lights showing yellow in the direction of approach to the intermediate holding position. The lights will be symmetrically spaced at 1.5m.

The lights and the installation therefore shall furthermore comply with the requirements of ICAO, Annex 14 Volume I, Chapter 5.

4.5 Runway Guard Lights

Runway guard lighting will be installed on either side of the runway hold position marking on the Bravo taxiway extensions link. The guard zone lighting system will comply and be installed as recommended in ICAO, Annex 14 paragraph 5.3.17 (ICAO, 2016).

The system will consist of:

- Amber, low intensity, uni-directional, elevated lights complying with FAA: L-861T AC 150/5345-46 and FAA: L-852T AC 150/5345-46; and
- The runway guard lights shall be connected to the existing single cable circuit supplying the existing guard lights.

4.6 Lead On lights

Lead on lighting will be installed on the proposed Bravo taxiway link for aircraft using the intersection for intersection take-offs. No lead off lights will be provided on this link for aircraft using the intersection for vacating the runway due to the proximity of the Hotel RET.

The system will consist of:

- Green, high intensity, uni-directional, inset lights complying with FAA: L-861T AC 150/5345-46 and FAA: L-852T AC 150/5345-46; and

4.7 Series isolating transformers.

The series isolating transformers shall comply with FAA specification 150/5345-47A. The transformers shall also be in compliance with ICAO Airdrome design manual, part 5, paragraph 3.2.1.7a.

The transformer and connection leads shall be pressure encapsulated with thermo-plastic elastomer, which resists to ozone and UV light exposure, to chemical agents and to shock and rough handling. The encapsulation shall not absorb water. The core shall be of rectangular shape made from very low loss, grain oriented steel laminations. Primary and secondary windings may not be superimposed on each other but shall be adequately separated. The transformer shall be fitted with a terminal for earthing one side of the secondary winding, complying with ICAO Aerodrome design manual - part 5 paragraph 3.2.1.7a.

The series transformers shall be installed inside the manholes and shall be strapped to the cable tray inside the manholes.

The transformer earth stud shall be connected to the manhole earth bar.

4.8 Primary connector kits

The connector kits shall comply with FAA L-823, class A specification AC 150/5345-26B

4.9 Signs

The signs shall include mandatory instruction signs, information signs, aerodrome identification signs and aircraft stand identification signs.

The signs shall comply with the following;

- (a) ICAO, Annex 14 Volume I, Chapter 5, Sections 5.4.1.1 to 5.4.6.3 and Appendix A.
- (b) The signs shall comprise of a rigid, self-carrying and low mass, aluminium housing with a polycarbonate UV protected and abrasive resistant front panel. The signage shall be applied to the inside of the front panel. The signs shall be installed on a frangible system.

- (c) The signs shall operate on a 6.6 A series circuit. The signs shall be LED illuminated. The photometric requirements shall be achieved without reflectors. The signs shall be IP34 protection class without the use of gaskets.
- (d) The information for the signs shall be provided to the contractor after the acceptance of the contract. The series transformers for the signs shall be installed in the closest manhole supplying the taxiway circuits. A PVC duct shall be installed from the manhole to the sign. The contractor shall supply and install the series transformer and secondary cable to the signs.

Illuminated vertical signage boards include:

- Taxiway information signage (location and direction indicators for wayfinding);
- Runway mandatory hold signage and runway vacated signage the new Bravo taxiway link runway hold point; and
- Intersection take-off (distance marker) signage where the Bravo taxiway link joins to the runway.

The signs will comply with ICAO Annex 14 paragraph 5.4 and Appendix 4 (ICAO, 2016). Refer to the document for an example of runway mandatory hold signage position relative to the runway holding point. Actual signage details to be provided by ACSA at the time of bid award.

The contractor shall provide the main contractor with the foundation details for the signs for construction by the main contractor.

4.10 Apron Floodlighting

4.10.1 General

It is proposed to investigate the existing apron lighting on the existing apron and on the aprons around the existing hardstands.

The performance requirements and design criteria will comply with the requirements of ICAO, Aerodrome Design Manual, and Part 4: Visual Aids, Chapter 13: Apron Floodlighting.

4.10.2 Floodlight lights

LED floodlights were supplied and installed on each mast to meet specific performance requirements. The contractor is to verify the existing luminaires function and provide adequate lighting as per the above mentioned standards.

The height of 1 x 30-metre-high mast pole and redesign the top end to house the existing platform and floodlights. Height of reduction is approximately 3 metres subject to confirmation on site.

All the control gear for the lights shall be installed in the distribution kiosk installed at the base of each mast.

The illumination of the apron shall comply with the requirements of Chapter 13 – Apron floodlighting. The following is the minimum requirements for aircraft stands:

- (a) Average horizontal illuminance not less than 20 lux;
- (b) Uniformity ratio (average to minimum) within a ratio of 4 to 1;
- (c) Average vertical illuminance at a height of 2 metres not less than 20 lux in the relevant directions;
- (d) Average horizontal illuminance on the total apron shall not be less than 50 % of the average horizontal illuminance of the aircraft stands with a uniformity ratio of 4 to 1 (average to minimum) in this area.

The contractor shall provide the necessary isolux diagrams for the lights offered indicating the illuminance on the apron. The lighting levels shall be guaranteed and shall be measured after the installation has been completed to confirm the guaranteed values. The contractor shall at his cost, rectify the installation if the lighting levels do not comply with the above requirements.

4.11 Control and Monitoring System

4.11.1 General

The existing control and monitoring system shall be upgraded to include all proposed changes to the AGL system

4.11.2 Constant Current Regulators (CCRs).

The CCRs shall comply with the following:

- (a) Type: N/A
- (b) Input voltage: 230V, 50Hz;
- (c) Cooling: natural air-cooled;
- (d) Brightness control: in 5 steps;
- (e) Operational parameters shall be adaptable and modifiable with PC and dedicated software;
- (f) Possibility to display the status values;
- (g) Multiplexed remote control with a well-established field bus;
- (h) Automatic input voltage compensation from +15% to -15%;
- (i) Local control to be provided for all functions;
- (j) True RMS output current digital ammeter;

The CCRs shall be capable of communicating via a proven protocol with any other necessary equipment installed in the substation. All the CCRs controls from the tower and back indication to the tower shall be communicated via the communication interface..

4.12 Cable Circuits

4.12.1 General

New cable circuits shall be installed from new CCR's at the existing substations. Only the guard lights and the new section of lights at Bravo taxiway extension will be supplied from the existing cable circuits.

4.12.2 Technical requirements.

All new cables to be installed will comply with FAA L – 824 specifications AC 150/53457D.

The primary cable shall be of the tape screened type and shall conform to the following specification:

- Conductor: Single core, 6 mm² cross sectional area. 7 tinned annealed copper wire strands.
- Conductor screen : Extruded semi-conducting layer to equalise electric stress around the conductor.
- Insulation : Extruded natural cross-linked polyethylene.
- Semi conducting screen : Helically applied semi-conducting woven tape with 15% overlap minimum for stress equalisation.
- Metallic screen : Helically applied copper tape with 15% overlap minimum.
- Protective tape : Helically applied tape with 15% overlap minimum.
- Sheath : UV protected coloured polyethylene.
- Sheath diameter : 13,0 mm ± 0,5 mm
- Drum length and weight : 1 000 m/291 kg
- Rated voltage : 2,8 / 5kV AC

- Conductor resistance : 3,1 ohms/km DC maximum @ 20 °C
- Insulation resistance : Greater than 100 m ohms/km @ 20 °C

A cable sample shall be submitted to the Engineer for his approval before the cable is ordered.

4.12.3 Series airfield cable installation

The series airfield cables shall be installed in the ground between existing manholes.

4.12.1 Series airfield cable colour coding and labelling

All primary cables, shall be black coded and where visible in manholes and in the substation, shall be marked with a suitable cable Identification (ID) label (to be approved by the Engineer prior to installation) not further than 100 mm from primary male and female connectors. The Engineer shall provide all cable ID's to the contractor during the execution of the contract.

4.12.2 Series airfield cable jointing

No primary cable joints shall be allowed. Where cables are required to be connected through, this shall be done by means of the appropriate connectors and only in manholes.

4.12.4 Secondary cable

Secondary Cable is 4mm², Copper conductor, 0.6/1kV insulated cable complying to the ICAO, Aerodrome Design Manual Part 5, electrical Systems requirements as well as FAA: L-824 AC 150/5345-7 Current edition. A cable sample shall be submitted to the Engineer for his approval before the cable is ordered.

4.13 Primary cable connectors

The primary cable plugs shall be according to FAA: AC 150/5345-26 (L-823) current edition and ICAO: Aerodrome Design Manual Part 5, Electrical Systems.

4.14 Secondary cable connectors

The secondary cable plugs shall be according to FAA: AC 150/5345-26 (L-823) current edition and ICAO: Aerodrome Design Manual Part 5, Electrical Systems.

4.15 Galvanised Steel Cans

The galvanised steel cans shall comply with FAA L-868 specification AC150.5345-42B. The can shall be 314 mm in diameter and be fabricated from at least 5 mm thick steel which shall be hot-dipped galvanised to SABS 763. The can shall be ± 600 mm long and have external and internal earth lugs.

Holes (big enough to accommodate the primary cable gland and or PVC secondary sleeves) shall be drilled into the can as required, before galvanizing.

The can's top flange shall be drilled and tapped according to the lights/can's base plate.

4.16 Shallow Bases

Shallow bases shall be installed in the asphalt for the runway edge lights in the taxiway bell mouths and for one approach fitting.

The hole for the base shall be core drilled into the asphalt and the base shall be fixed/fastened into the asphalt with EPOXI.

4.17 Base plates.

The pressed steel base plates where required shall be designed in accordance with FAA specification AC 150/5345-16A. The base plate shall have three mounting holes and shall be tapped and drilled to fit onto the flange of the steel can or concrete base.

Two types of base plates shall be supplied. The one shall only be a cover for the steel can and the other base plate shall have a 2" GAS II TPI tapped sleeve in the middle, to suit the luminaries' breakable couplings. The tapped base plate shall also be fitted with an earth screw.

4.18 Cable ducts, manholes and manhole sundries.

All manholes and cable ducts shall be installed by the main contractor. The contractor shall be responsible for ensuring that the ducts for secondary cables are installed in the correct positions especially where the contractor has to core to install the bases for lights which are to be installed on the runway and on the runway shoulder. On the Bravo extension where cores are already created, the main contractor is to seal the entrance of those cores before laying new asphalt layers, the GPS coordinates are to be determined before new layers of asphalt are done.

The ovality tests are to be conducted before new layers of asphalt are laid.

4.19 Earthing and Bonding

A 16 mm² bare copper earth wire (BCEW) shall be installed 150 mm above the cable. At each manhole, the BCEW shall be terminated onto the manhole earth bar.

A 16 mm x 1,2 metre earth spike shall also be installed next to the manhole. The earth spike shall also be bonded to the manhole earth bar.

All the other equipment (series transformer, connectors, etc.) shall be bonded to the manhole earth bar.

The maximum acceptable earth electrode resistance for the high masts shall not exceed 5 ohms:

After completion the Contractor shall arrange for earthing-resistance tests to be carried out in the presence of the Engineer by a Specialist Contractor. Any further earthing that may be required will be determined by the test results.

5. APPROVAL OF MATERIAL AND EQUIPMENT

The Employer reserves the right to ask for a sample, component or module of any equipment offered by the Contractor for test and inspection purposes, for a period of 7 working days. The Contractor shall submit all material, equipment and any other additional components to the Engineer for his approval before placing any orders. The tenderer shall furthermore submit a list detailing all imported/special materials required.

6. GUARANTEE

The entire installation, including all material and equipment, shall be guaranteed for 12 months from the date of acceptance by the Engineer.

Within this period the Contractor shall immediately replace, at his expense, all faulty material and equipment with new, unused equipment on the instruction of the Employer or the Engineer, and the guarantee period of 12 months for such replaced material and equipment shall commence on the day of acceptance of such replaced material and equipment.

The Engineer's decision regarding the repair or replacement of faulty material and equipment will be final.

7. SPARES

The contractor must make an allowance for the provision of spares. A list of essential spares required shall be included in the bill of quantities.

The list of proposed spares shall be subject to approval by the engineer. Such approval has to be obtained prior to placing an order for the spares.

8. MEASUREMENT AND PAYMENT

<u>Item</u>	<u>Unit</u>
8.1.1 Additional payment for night work	Night
The Contractor shall ensure that all addition payment for night works shall be included in their tendered rates for the specific works which are indicated to be undertaken at night on the bill of quantities. No additional payments will be made for night works.	
<u>Item</u>	<u>Unit</u>
8.1.2 Coring in asphalt to install shallow bases	No
The unit of measurement shall be the number of cores drilled.	
The tendered rate shall include full compensation for all the equipment, material and labour that is required to core into the asphalt to install the shallow bases.	
<u>Item</u>	<u>Unit</u>
8.1.3 Supply and install approach luminaires	No
The unit of measurement shall be the number of approach luminaires installed.	
The tendered rate shall include full compensation for the supply, installing, testing and commissioning of the approach luminaires, including lamps, filters as specified, glands, earth tags, secondary rubber insulated cable, two prong plugs, frangible couplings, base plate and all other material required to install the luminaires on foundations.	
<u>Item</u>	<u>Unit</u>
8.1.4 Supply and install shallow base	No
The unit of measurement shall be the number of shallow base's installed.	
The tendered rate shall include full completion for all the equipment (1.e. jig), material (i.e. epoxy resin) and labour to install the shallow base.	
<u>Item</u>	<u>Unit</u>
8.1.5 Supply and install steel can base plate	No
The unit of measurement shall be the number of steel can base plates installed.	
The tendered rate shall include full completion for the supply, delivery and installation of the steel can base plate on site.	
<u>Item</u>	<u>Unit</u>
8.1.6 Supply and install conduit elbow	No
The unit of measurement shall be the number of conduit elbow's installed.	
The tendered rate shall include full completion for the supply, delivery and installation of the conduit elbow on site.	

	<u>Item</u>	<u>Unit</u>
8.1.7	Supply and install breakable couplings The unit of measurement shall be the number of breakable couplings installed. The tendered rate shall include full completion for the supply, delivery and installation of the breakable couplings on site.	No
	<u>Item</u>	<u>Unit</u>
8.1.8	Supply and install secondary plug and socket sets for secondary cable The unit of measurement shall be the number of plug and socket sets supplied and installed. The tendered rate shall include full compensation for the supply, installing, testing and commissioning of the plug and socket on the secondary cable for connecting to the plug and socket on the luminaire and series transformer.	No
	<u>Item</u>	<u>Unit</u>
8.1.9	Supply and install signage The unit of measurement shall be the number of signages supplied and installed. The tendered rate shall include full compensation for the supply, installing, testing and commissioning of the signages, including the lamps for all the required sections, the earth tags, the mounting flanges with securing sundries, and all other material required to install the signage. The signage legs breakable couplings and conduit elbow will be measured elsewhere.	No
	<u>Item</u>	<u>Unit</u>
8.1.10	Supply and install 1 000/600 volt secondary airfield cable. The unit of measurement shall be the length in metre of secondary airfield cable supplied and installed. The tendered rate shall include full compensation for the supply, transporting, handling, laying, cutting, terminating, connecting and testing the secondary cable including providing the cable identification labels.	m
	<u>Item</u>	<u>Unit</u>
8.1.11	Supply and install cable labels (I/D) The unit of measurement shall be the number of cable labels supplied and installed. The tendered rate shall include full compensation for the supply, installing of the cable labels. All sundries and tools for the installing of the cable labels shall be included.	No
	<u>Item</u>	<u>Unit</u>
8.1.12	Testing and issue primary cable test certificate every 1 000 m The unit of measurement shall be the number of 1 000 m tests performed. The tendered rate shall include full compensation to make the test equipment available, to perform the test and to issue a certificate.	No
	<u>Item</u>	<u>Unit</u>
8.1.13	Obtain radio licenses. The unit of measurement shall be the number of radio licences obtained. The tendered rate shall include full compensation for the licenses fees.	No
	<u>Item</u>	<u>Unit</u>

8.1.14	Supply airfield radio's for communication	No
	The unit of measurement shall be the number of radios purchased.	
	The tendered rate shall include full compensation for the supply and operation of the radios during the contract period.	
	<u>Item</u>	<u>Unit</u>
8.1.15	Supply airfield radio's for communication	No
	The unit of measurement shall be the number of radios purchased.	
	The tendered rate shall include full compensation for the supply and operation of the radios during the contract period.	
	<u>Item</u>	<u>Unit</u>
8.1.16	Terminating (splicing) of optical fibre cable	No
	The unit of measurement shall be the number terminations.	
	The tendered rate shall include full compensation for all the material and equipment that is required to terminate (splice) the optical fibre cable on the interface unit.	
	<u>Item</u>	<u>Unit</u>
8.1.17	Supply and install CCR bracket	Lump Sum
	The unit of measurement shall be a lump sum.	
	The tendered rate shall include full compensation for the supplying and installing of the two painted steel brackets. The rate shall also include for all the material and equipment that will be required to install the two brackets. The colour of the brackets shall be similar to the CCRs colour.	
	<u>Item</u>	<u>Unit</u>
8.1.18	Calibrate and certify the earth fault monitoring unit	No
	The unit of measurement shall be a number of earth fault monitoring units re-calibrated and certified.	
	The tendered rate shall include full compensation for all necessary equipment and measures to Calibrate and certify the earth fault monitoring unit.	
	<u>Item</u>	<u>Unit</u>
8.1.19	Calibrate and certify the lamp failure monitoring unit	No
	The unit of measurement shall be a number of lamp failure monitoring units re-calibrated and certified.	
	The tendered rate shall include full compensation for all necessary equipment and measures to Calibrate and certify the lamp failure monitoring unit.	
	<u>Item</u>	<u>Unit</u>
8.1.20	Removal of existing equipment from the approach, runways, taxiways, apron and substations	Lump Sum
	The unit of measurement shall be a lump sum.	
	The tendered rate shall include full compensation for the disconnection of all power as well as communication cables from the equipment. The removal of the equipment out from the approach, runways, taxiways, apron and substations (including but not limited to all lights, PAPIs, CCRs, etc) and the handing over thereof to the relevant authorities at the King Shaka Airport.	

<u>Item</u>	<u>Unit</u>
8.1.21 Open and re-instate the trenches screed in the substations The unit of measurement shall be a lump sum. The tendered rate shall include full compensation for the opening (breaking) the existing trenches screed, the removal of the sand, the re-installation of the sand (after the new cables have been laid) and the casting of a screed to close the trenches again.	Lump Sum
<u>Item</u>	<u>Unit</u>
8.1.22 Supply and installation of flexible conduit The unit of measurement shall be the length of running metre of flexible conduit supplied and installed The tendered rate shall include full compensation for the supply, delivery and installation of the flexible conduit. The rate shall also include for the couplers on both sides of the conduit.	m
<u>Item</u>	<u>Unit</u>
8.1.23 Spares The unit of measurement shall be the lump sum. The tendered rate shall include full compensation for the supply and delivery of the spares as approved by the Engineer.	Lump Sum
<u>Item</u>	<u>Unit</u>
8.1.24 Supply tools required to maintain the installation The unit of measurement shall be a lump sum. The tendered rate shall include full compensation for the supply, delivery of all tools required to do the maintenance on the installation.	Lump Sum
<u>Item</u>	<u>Unit</u>
8.1.25 Electrical installation on the Service ducts The unit of measurement shall be a lump sum. The tendered rate shall include full compensation for the supply, delivery and installation of the necessary electrical equipment required in the Service ducts.	Lump Sum
<u>Item</u>	<u>Unit</u>
8.1.26 Supply, delivery and Installation of the Illuminated signs The unit of measurement shall be a lump sum. The tendered rate shall include full compensation for the supply, delivery and installation of the Illuminated signs. The rate shall also include for the cable and any other component/element required to complete the installation.	Lump Sum
<u>Item</u>	<u>Unit</u>
8.1.27 Earth resistivity tests The unit of measure shall be per point where such tests have to be carried out. The tendered rate shall include for the carrying out of the earth resistivity tests by a Specialist Contractor.	No

<u>Item</u>	<u>Unit</u>
8.1.28 Earth tests	No
The unit of measurement shall be the number of earth tests undertaken.	
The tendered rate shall include full compensation for providing the equipment required to undertake the tests and the undertaking of the tests.	
The tendered rate shall include full compensation for the upgrade of the existing ILS control rooms. Allow for any civil and electrical work required as well as the installation of new air conditioning units to accommodate all the new equipment.	

9. Standby Generators specifications are attached below

2 x 500 Kva diesel generators were ordered and positioned on the Foxtrot Apron by a previous contractor. These generators were never commissioned nor had any batteries installed within them. They were ordered and delivered by P&S Power, it is within your scope of works to contact and arrange with P&S Power to conduct a site visit to test, install batteries and commission both of these generators and to issue reports and certificates.

Through the current supplier of the generators, a 3-year extended service plan is to be sourced, if applicable. The supplier is to provide detail of the service plan inclusions.

REFER TO ANNEXURE D FOR SPECIFIC GENERATOR SPECIFICATIONS.

AIRPORTS COMPANY SOUTH AFRICA

KING SHAKA INTERNATIONAL AIRPORT

TENDER NO: KSIA7806/2025/RFP

**PROCUREMENT OF A CIDB GRADE 9 CE CONTRACTOR THE COMPLETION OF BRAVO TAXIWAY
EXTENSION AT KING SHAKA INTERNATIONAL AIRPORT FOR A PERIOD OF 12 MONTHS**

C3.6C: PARTICULAR (PROJECT) SPECIFICATIONS: MECHANICAL

Notes to Tenderer:

1. In the event of a discrepancy between the Specifications (including the Project Specifications) and the drawings and / or the Bill of Quantities, the discrepancy must be brought to the Employer's Agent attention to be resolved.

PSS 1 : DEMOLITION AND SUPPLY, INSTALL AND TEST STEEL PIPELINES AND ANCILLARIES

PSS 1.1 SCOPE

This specification covers procurement, transportation, stringing, welding, weld-joint coating, laying, cleaning, testing, and all ancillary works for the installation of steel pipelines for the new apron to be constructed in conjunction with the new Bravo taxiway. The Contractor will be working within an operational airport area. The pipeline design includes the following:

- (i) Pipeline size :
 - Fuel Hydrant Pipeline : 16" (400mm nominal pipe size), API 5L Grade B (Std) :
9.5mm wall thickness,
 - Pipe Material : Seamless (SMLS) or ERW.
- (ii) 16" Pipe bends : Long Radius, Sched 40, ASTM A234 Gr WPB, ANSI B16.9 BE
- (iii) Hydrant Design Pressure : 15 Bar
- (iv) Hydrant Operating Pressure: 11 Bar
- (v) Test Pressure: : 22.5 Bar

This specification shall be read in conjunction with the following further particular specifications:

- (i) Particular Specification PSS2 : Supply, Fabrication, Installation and Testing of Valves and Ancillaries.
- (ii) Particular Specification PSS3 : Coating.

Other contractors may be appointed by the Engineer or Employer to undertake inspections and tests, additional to the QA/QC tests and inspections undertaken by the Contractor. This may include, but is not limited to, the Authorized Inspection Authority (AIA), to conduct audits on all QA/QC procedures, including implementation thereof, covering:

- (i) Coating.
- (ii) Welding.
- (iv) Pressure testing of the pipelines and associated installations.

The Contractor shall provide unencumbered access to persons employed by such third parties and shall furnish all records reasonably required by such third parties in the execution of their duties.

PSS 1.2 SUPPORTING SPECIFICATIONS AND CODES

The standard specifications and codes applicable to the works shall include the following, as well as any further codes and specifications referenced therein.

Table 1: Applicable Standards

Standard Number	Title
API Standards	
API 5L	Specification for Line Pipe
API 5L3	Conducting Drop Weight Tear Test on Line Pipe
API 5L8	Field Inspection of New Line Pipe
API 1104	Welding of Pipelines and Related Facilities
API RP 5C6	Welding Connections to Pipe
API RP 1110	Recommended Practice for the Pressure Testing of Steel Pipelines for the Transportation of Gas, Petroleum Gas, Hazardous Liquids, Highly Volatile Liquids or Carbon Dioxide
API 1540	Design, Construction, Operation and Maintenance of Aviation Fueling Facilities, IP Model Code of Safe Practice Part 7
API 1584	Four-Inch Hydrant System Components and Arrangements
API 1585	Guidance in the cleaning of aviation fuel hydrant systems at airports
API 1594	Initial pressure strength testing of airport fuel hydrant systems with water
ASTM Standards	
ASTM E384	Standard Test Method for Micro-indentation Hardness of Materials
ASTM G62-14	Standard Test Methods for Holiday Detection in Pipeline Coatings
ASME Standards	
ASME B31.4	Pipeline Transportation Systems for Liquids and Slurries
ASME IX	Welding and Brazing Qualifications
BS/EN Standards	

BS 2704	Specification for calibration blocks for use in ultrasonic flaw detection
BS EN ISO 9934-1	Non-destructive testing. Magnetic particle testing. General principles
BS EN 10160	Ultrasonic testing of steel flat product of thickness equal or greater than 6 mm (reflection method)
BS EN ISO 17636-2	Non-destructive testing of welds. Radiographic testing. X- and gamma-ray techniques with digital detectors
BS EN ISO 17640	Non-destructive testing of welds. Ultrasonic testing. Techniques, testing levels, and assessment
BS EN ISO 19232-1	Non-destructive testing. Image quality of radiographs. Determination of the image quality value using wire-type image quality indicators
Further Specifications	
SANS ISO 9001	Quality Management Systems - Requirements
SANS ISO 9002	Quality systems - Model for Quality Assurance in Production, Installation and Servicing
SABS 0227	Pressure Vessel Inspection Authorities
IP MCoSP Part 2	Design, construction and operation of petroleum distribution installations
NACE SP0286	Electrical Isolation of Cathodically Protected Pipelines

The latest revision of the standardized specifications listed above shall be applicable. The sequential order of precedence for the applicable codes, standards, specifications and regulatory requirements shall be as follows:

- (i) Government acts and regulations.
- (ii) Employer project guidelines, specifications and standards.
- (iii) South African standards.
- (iv) International standards.

In the event of an inconsistency, conflict or discrepancy between any of the standards, specifications and regulations, the most stringent and safest requirement shall prevail. Any inconsistencies critical to the design and construction shall be brought to the attention of the Engineer for resolution, prior to construction.

PSS 1.3 MATERIALS

(a) General

All materials required for the installation of the pipeline, including all associated installations and ancillaries, shall be supplied by the Contractor, i.e. the Employer will not be issuing any materials required for the works.

A bill of all proposed materials shall be submitted to the Engineer for approval prior to commencing fabrication and manufacture.

Identification and certification of all specified fittings, pipes and all flanges is required and the Contractor shall provide full details to the Engineer, as and when required, and shall also include these in the As-Built data packs and drawings.

Before accepting any pipes, fittings or other items of equipment, the Contractor shall carry out a thorough inspection to ensure that materials have been delivered undamaged as ordered. Pipes and bends shall be checked for the following:

- (i) Identification, as specified on the order.
- (ii) Certification, as specified on the order.
- (iii) Protective end caps and clean internals.
- (iv) Ends beveled and pipe cross sections conform to API 5L.
- (v) Pipe and bends have been internally lined, as specified.
- (vi) Quantities delivered are as per the order.

(b) Steel Pipe

(i) General

All materials and methods of production for steel pipes shall be in accordance with the requirements of API 5L for Grade B seamless, ERW or SAW pipe. Only pipe manufacturers in possession of a valid API certificate, covering the type of pipe to be installed, shall be permitted to supply line pipe for the works. The Contractor shall provide the necessary proof and documentation prior to placement of any pipe orders, for review and approval by the Engineer.

All relevant provisions of API 5L shall apply as relevant, including, but not limited to, the following:

- (1) Traceability of line pipe, include clear marking of heat numbers, which are also to be indicated on all delivery notes, copies of which are to be handed to the Engineer and included in the as-built data packs.
- (2) Chemical, mechanical and non-destructive testing of all line pipe, to include all applicable tests as listed in API 5L. Copies of all test records shall be submitted to the Engineer and included in the as-built data packs. These records shall be fully traceable to individual pipe lengths.

(ii) Handling and Transport of Line Pipe

The Contractor shall provide a method statement for the transport, handling, stockpiling (including temporary stockpiling), hauling, loading and unloading pipe, including details of the equipment to be used, for prior review and approval by the Engineer.

This shall include transportation of the line pipe to the internal coating facilities, from the coating facilities to the stockpiles on site and from the stockpiles to the point of final installation. The following general principles shall apply.

Pipe handling equipment shall not cause damage to the pipe or internal coating in any way.

Plastic end caps shall be provided at each end of the line pipe, to prevent ingress of dirt, water and other foreign matter.

The pipe shall be loaded and placed on trucks in such a manner that flexing and shifting of the pipe during hauling is minimised. Care shall be exercised in handling or sorting pipe to avoid distortion, flattening, denting, and scoring.

Dropping, dragging and skidding of pipe shall not be permitted. During loading, each length shall be lowered into position without dropping.

Metal bolsters shall not be allowed. Truck bolsters supporting the pipes shall be shaped to support at least 35% of the circumference of the pipe and shall be padded.

Each load shall be tied down using cargo winches or similar, with webbing straps of suitable proportions and arranged in such a manner that tie down is achieved over the bolster. Tie-down chains are not permitted.

During the road haul, tie down winches shall be inspected and re-tightened after hauling not

more than 25 kilometres, then inspected and re-tightened as required to ensure that movement of the pipe is kept to a minimum.

Each joint of pipe, except the top row, shall be supported on padded wooden scalloped bolsters of 150 mm minimum width.

Approved padding shall be placed at contact points between pipe and bolsters, and between adjacent pipes.

Where pipe trucks are required to traverse cross slope, the number of pipe lengths is to be limited to ensure stability of the trucks against roll-over.

Any part of the pipe not separated from the road surface by the solid tray of the truck or trailer shall be suitably protected against stones or other debris thrown up from beneath the vehicle by means of a belly tarp.

Pipes shall at no stage be placed or stacked directly on the ground. 150 mm wide timber beams shall be provided to support the pipes. Pipes shall not be stacked higher than 4 layers. Suitable padding shall be provided to prevent direct metal-to-metal contact between adjoining pipes.

(c) Pipe Bends

All pipe bends shall be factory-made wrought steel long radius (1.5D) butt-welding induction bends, to be fabricated in accordance with ASME B16.9, ASME B16.49 and all further applicable specifications referenced therein. The grade of steel shall be ASTM A234 WPB with Sched. STD wall thickness. After forming, the diameter of an elbow shall not be reduced at any point by more than 2 percent of the specified nominal diameter.

(d) Coating of Line Pipe and Bends

An external tape-wrap coating shall be applied on site, as described under Specification PSS3.

The steel pipeline and bends are to receive an internal coating, to be applied at an approved paint shop, as described under Specification PSS3.

PSS 1.4 PLANT, LABOUR AND EQUIPMENT

(a) General

The Contractor shall assess working area requirements, within the areas assigned by the Employer, and present plans of work areas, including material lay-down and storage areas, to the Engineer, all in accordance with the HSE and permitting systems as stipulated by the Employer and/or Engineer.

High standards of housekeeping will be required, in strict compliance with the permits and permit conditions to be issued by the Employer.

The Contractor shall provide all staff, plant and equipment, including adequate support staff, tools, implements and materials on Site to perform the works in accordance with the standards as set forth in these specifications, and at the production rates required to meet the approved completion dates.

(b) Safety

The Contractor shall be responsible for ensuring that all work associated with welding is carried out safely, without hazard to personnel, plant, equipment or airport operations. All work shall be carried out strictly in accordance with the requirements and restrictions of the work permits issued for each task. All welding operations, including grinding, shall be covered by and comply with the Project Safety Management Plan and Specifications, as well as the Employer's particular operational and safety requirements.

The Contractor shall observe the safety requirements relating to radiography and working with purge gases. Personal protective equipment appropriate for welding operations shall also be provided to all personnel engaged in such activities.

(c) Pipeline Team

The resources to be provided by the Contractor for the welding and laying of line pipe shall include, but not be limited to, the following:

Supervisory Staff and Qualified Welders

- (i) Senior pipelaying foreman.
- (ii) Welding supervisor.
- (iii) Surveyor.
- (iv) Welding team.

- (v) Inspection and testing teams.
- (vi) Coating team.
- (vii) Hydrotesting team.
- (viii) Commissioning team.

Plant and Equipment

- (i) Trucks for transporting line pipe.
- (ii) Side booms or other appropriate lifting equipment for lowering-in.
- (iii) Cranes for lifting pipe at stockpiles.
- (iv) Welding machines.
- (v) Excavators.
- (vi) Pedestrian roller.
- (vii) Water cart with pump.
- (viii) Equipment for hydrotesting.
- (ix) NDT equipment.

PSS 1.5 WELDING OF LINE PIPE

(a) General

Pipeline welding procedures, qualifications and materials shall comply with API 1104, except where amended by this specification. All pipes shall be joined by butt welding. The interior of each pipe shall be properly cleaned prior to welding.

All temporary attachments for testing and commissioning purposes shall be welded, inspected and tested in accordance with this specification.

(b) Quality Control

Before commencing work, the Contractor shall submit his Quality Control Plan (QCP) to the Engineer for review and approval. The plan shall include the following:

- (i) Scope of QCP.
- (ii) Company structure, human resources and responsibilities.

- (iii) List of tools and equipment to be used.
- (iv) Processes for qualification of welding procedures.
- (v) Processes for welder qualifications.
- (vi) Schedule of weld procedures, including repair procedures.
- (vii) List of destructive and non-destructive tests, including test procedures.
- (viii) Proposed company to carry out inspections, including names and CV's of inspection personnel.
- (ix) Welding inspectors shall have minimum Level II qualifications. Copies of NDT and radiography certification to be included.
- (x) Proposed laboratory to carry out destructive testing of welds.
- (xi) Index of data packs and examples of as-built records to be provided.

Weld procedure qualification records and welder qualification shall be witnessed and endorsed by a Contractor-appointed, Government approved inspection authority, accredited in terms of SABS 0227.

The Contractor shall provide independent weld inspection, including destructive and non-destructive tests and interpretation of results. These services shall be provided by duly accredited companies and inspectors, to be approved by the Engineer.

(c) Particular Welding Requirements

For aviation fuel hydrant pipeline and piping systems the following welding processes shall be used:

Pipe Size	Welding Process
Smaller than or equal to 50 mm	Gas Tungsten Arc Welding (TIG)
Larger than 50mm	Shielded Metal Arc Welding (SMAW)
All Stainless Steel piping	Gas Tungsten Arc Welding (TIG)

Position or roll welding shall be permitted in accordance with the test procedure. Separate procedures shall be submitted for positional and roll welding.

Vertical-up welding shall be used for the root runs on all tie-ins and all welds using external line-up clamps and at all repair welds.

The completed weld shall be vertical up for pipe diameters less than 150mm and for all welds to valves, flanges or fittings, including fillet welds.

Separate procedures shall be submitted for vertical downward, vertical upwards and horizontal welding.

(d) Destructive Tests required for Test Welds

The following destructive tests shall be performed on the test welds:

(i) Tensile Strength Test

Tensile tests shall be performed as described in API 1104.

If any specimen breaks outside the weld at a tensile strength below the minimum tensile strength of the pipe material, the pipe shall be considered suspect and its physical properties shall be investigated and reported on to the Engineer before any additional test joints are made.

(ii) Hardness Test (Addition to API 1104)

A hardness survey shall be carried out on each procedure qualification test weld across the weld metal, heat-affected zone and parent metal. The maximum hardness values are as below:

Hardness Location	Manual welding, Cellulosic electrodes HV10	Manual welding, Basic electrodes HV10
	Hardness (HBW)	
Weld metal root	275	275
Weld metal cap	275	275
HAZ root	275	325
HAZ cap	325	325

A record of results of each weld destructively tested shall be made and the information included in the as-built records. The records shall indicate the location of the weld, welding procedure used, welder's number and the results of tests.

(e) Non-Destructive Testing (NDT)

The following NDT shall be performed on all test welds, as well as for all welder qualification purposes, on production welds and for weld repairs.

(i) Radiographic Examination

100% radiographic examination is required for all butt welds, including tie-ins and repairs. Radiography shall be to BS EN ISO 17636-2 or equivalent standard approved by the Engineer. Radiography shall be done using X-rays, unless otherwise approved by the Engineer. Lead intensifying screens shall be used.

A wire type penetrometre shall be used. This shall conform to BS EN ISO 19232-1. Acceptable radiographic sensitivity levels, using a wire-type quality indicator IQI to BS EN ISO 19232-1, shall be as shown in the following table.

Table 2 : Radiographic Sensitivity Levels

Max Thickness (mm)	X Ray %
3	2.4
6	1.6
12	1.4
25	1.2

In addition to the information as specified in API 1104 and, unless otherwise directed by the Engineer, the following identification markings shall be included on the film, using lead numbers and letters:

- (i) Welder(s) ID No(s).
- (ii) Unique weld no.
- (iii) Date welded.
- (iv) Pipeline number/identification.

The film density shall be chosen to give maximum contrast in the weld area. Fine grain film shall be used, unless otherwise approved by the Engineer. The H&D density shall be between 2 and 3. For X-Ray radiography D7 film (e.g. Fuji 100) shall be used.

All radiographic film shall be thoroughly dried prior to viewing and shall be processed to allow storage of film without deterioration for a period of at least 5 years.

The Contractor shall include in his hand-over documentation a cross-referenced index of all radiographs produced and arrange for the storage of all radiographs in a safe and secure location for a minimum of 5 years.

(ii) Ultrasonic Examination

Ultrasonic testing shall be used to verify minimum wall thicknesses, as required. 100% Ultrasonic examination is to be carried out using compression wave techniques and shall be used at the following areas:

- (1) A zone 100mm wide around planned cut-outs of nozzles and branches, to check for laminations.
- (2) An 80 mm wide zone around butt weld ends of butt-welded fittings, weldneck flanges, weldolets and pipe ends where pipes are cut to check for laminations.

Ultrasonic testing shall be to BS EN ISO 17640. Probes shall be calibrated at least daily using the test blocks A2 or A4 as specified in BS 2704.

Checking pipe materials for laminations shall be to BS EN 10160.

(iii) Magnetic Particle Inspection (MPI)

MPI shall be conducted in accordance with BS EN ISO 9934-1 or an equivalent standard approved by the Engineer. 100% MPI shall be carried out at the following areas:

- (1) All repair welds.
- (2) All welds to fittings.
- (3) All fillet welds.
- (4) All branch welds.

(iv) Dye Penetrant Examination

100% Dye Penetrant examinations shall be used on stainless steel where MPI is not possible. The test method shall be as prescribed in API 1104.

Dye penetrant may also be used in lieu of MPI, if so approved by the Engineer.

(f) Welding Procedure Qualification

Welding procedures shall be established, documented and qualified for all welding on the pipeline and associated fittings prior to commencement of production welding, in accordance with the

requirements of API 1104. The Contractor shall also provide and qualify weld repair procedures for root, hot pass and cap welds, as set forth in API 1104.

A separate procedure shall be provided for each set of essential variables, as described in API 1104. A procedure shall be re-qualified by test if any of the essential variables listed in API 1104 applies. Re-qualification of the welding procedure is required if the size or brand of consumable is changed, even if the change does not represent a change of the electrode classification.

The welding procedure specifications shall be submitted for the approval by the Engineer not less than 14 days before the intended start of procedure qualification welding. Qualification tests shall not proceed until the procedures have been approved by the Engineer and the AIA.

Mechanical testing of welds for procedure qualification shall be carried out at the Contractor's expense at a laboratory nominated by the Contractor and approved by the Engineer. All test certificates and all laboratory reports, including failures, shall be submitted to the Engineer for approval or comment.

(g) Preparation of Procedure Test Welds

All weld passes for procedure test welds shall be deposited at the maximum rate of travel which will be used in production welding.

The time interval between the start of the root bead and the start of the hot pass shall be the maximum which will apply to production welding and the maximum time interval shall be regarded as an integral part of the procedure. Details of the burn-off rates shall be included in the procedure qualification record (PQR). The maximum time interval between the hot pass and subsequent welding shall be as detailed in the welding procedure specification.

If mainline welds are to be allowed to cool to ambient between the hot pass and the fill and the cap runs, then the procedure welds must be cooled to ambient between the hot pass and the fill and the cap runs and the time interval recorded.

Procedure welds for mainline welding shall be demonstrated on full pipe lengths, with one pipe being supported on skids and the other held in a sling. On completion of the root bead the pipe shall be lifted and lowered to simulate mainline operation.

The distances and directions of such movement shall represent the maximum which thereafter will

be permitted in welding. If it is the intention to double joint then the procedure weld shall be performed on full length double jointed pipes.

For mainline weld procedures using an internal line-up clamp, no procedure in which the clamp is released, and/or the pipe is moved or lowered off the sling before the root bead is complete and the arc is extinguished, shall be permitted.

If an external alignment clamp is used, the root bead shall be made in approximately equal segments, evenly spaced around the circumference, with a cumulative length of not less than 50% of the pipe circumference, before the clamp is released. The 50% welded length shall include a continuous run at both 12 and 6 o'clock positions of at least 75 mm continuous length.

Re-qualification of a procedure is required in the event that the clamp is changed, or there is reasonable evidence that the performance of the original clamp has deteriorated.

For mainline welding and tie-in procedures, a key parameter is the capability of the clamp to reduce hi-lo. This shall be demonstrated in the procedure weld, which therefore should be done on pipes having at least average out of round. Pipes for procedure testing shall be selected for their compliance with this requirement.

Procedure qualification test welds shall be examined in accordance with all the requirements as set forth in API 1104.

The Contractor shall not be permitted to commence with mainline welding until all tests and the welding procedure(s) have been have been certified by the AIA and signed off by the Engineer.

Welding procedure test welds will be examined by:

- (i) Visual examination.
- (ii) Radiography in accordance with API 1104.
- (iii) MPI of the internal surface of the weld (where required) and shall comply with the requirements of this Specification.
- (iv) The destructive test requirements as specified in API 1104.

The welds shall satisfy all of the required examinations in order for the procedure to be qualified. All test pieces, radiographs and other test records shall be permanently marked and cross

referenced for identification and correlation with the welding procedures. On completion of demonstration and testing, formal documentation shall be completed on the appropriate forms and submitted to the Engineer, together with the test records and test specimens.

(h) Welder Qualification

Two weeks prior to the commencement of any production welds, the Contractor shall provide full names, CV's and current welding qualifications for each welder to the Engineer. Such welders shall also submit themselves to further tests and qualifications on site to demonstrate that they are competent to undertake welding for the pipe sizes, material types, consumables and weld passes for which they are to be qualified.

Welder approval tests shall be witnessed by an accredited Government approved inspection authority and will be subjected to visual and NDT inspections. All costs attached to the qualification of welders, including NDT inspections and appointment of inspection authorities, shall be borne by the Contractor.

Welder qualification test welds will also be subject to independent visual and NDT (radiography) by the Engineer and review and approval by the AIA. The Contractor shall provide the Engineer with the necessary assistance for undertaking such NDT and AIA assessments.

Short pipe lengths may be used for welder qualification tests and there is no requirement for movement of the pipe to simulate production welding.

Each qualified welder shall receive a unique number, which shall be marked against each weld or partial welds made by that welder. The welder number shall also be shown on all reports, radiographs and NDT documents to be used and shall be included in the daily welding reports and as-built data. A register of all welders and assigned numbers shall be maintained and furnished to the Engineer. If a welder leaves the job, his number shall not be re-assigned.

Welders shall only be allowed to make welds in accordance with the procedures and parts of the weld for which they have qualified. Separate welder qualifications are required for undertaking weld repairs. At the discretion of the Engineer, a welder may be permitted to qualify for filling and capping only.

If a welder fails to qualify at first attempt he shall be allowed one further attempt. Subsequent attempts to qualify the welder will only be permitted when the welder has undergone additional

training and has demonstrated his ability to produce welds of the required quality standard.

The Engineer may instruct that any welder incapable of undertaking part(s) of a designated weld procedure or, having qualified for a procedure, fails to maintain the required skills and quality requirements during mainline welding, be removed from site.

The Engineer will sign the welder qualification certificates and welding procedures approved for use in the work and return a signed copy. Welder qualification certificates not formally approved in this manner shall be invalid. A register shall be maintained of all qualified welders and include details of their particular qualifications.

(i) Production Welding

(i) Preparatory Works

The pipe shall be prepared, as follows, immediately before each joint of pipe is aligned for welding:

- (1) Any protective coating on the pipe or fittings which may be harmful to the weld shall be cleaned off by power wire brushing or by other approved means. The internal and external surfaces of each pipe end shall also be power wire buffed a minimum of 20 mm from the welding edge to remove all rust, scale, dirt and other foreign materials. Grinding shall not be used for this purpose.
- (2) The uncoated internal parts of the pipe shall be cleaned and sanded to a visual near white metal finish, to remove all traces of oil, oxide or scale.
- (3) The interior of each pipe shall be swabbed to remove dust, loose rust and other loose particles. The effectiveness and safety of the pipe cleaning procedure shall be demonstrated at the time of welding procedure qualification.
- (4) Any moisture or water shall be removed by swabbing and drying, and steps taken to ensure that water will not encroach upon the buffed area.

(ii) Disposition of Short Pieces

Short pieces of line pipe shall not be allowed to accumulate and all short pieces of pipe 2 m or more in length shall be moved ahead and welded into the straight sections of the pipeline.

The pipe heat number and length shall be clearly marked on any short pieces equal to or greater than 2 m in length, at the time the full joint is first cut, to ensure 100% future traceability.

All short pieces of line pipe less than 2 m shall be disposed of in a manner to be approved

by the Engineer.

A record of all short pieces of pipe shall be maintained and indicated on the as-built drawings.

(iii) Electrodes

Material certification must be provided for all filler materials and welding consumables. The Contractor shall implement a system to ensure proper control over the issue, use return and storage of all filler materials and welding consumables.

All electrodes shall be stored and treated in accordance with the manufacturer's recommendations. The Contractor shall make provision for storing electrodes and filler materials at elevated temperatures where this is specified by the manufacturer.

A sufficient number of quivers shall be provided to welders to protect electrodes and filler materials whilst welding and travelling on site.

A manufacturer's certificate shall be supplied for each batch of electrodes used. These shall be supplied in the 'As Built' information for inclusion in the hand over documentation.

All mainline, tie-in and fitting weld root and hot pass runs shall be laid with a class electrode as described in API 1104. No electrode designed to produce a weld deposit with 0.2% or greater of molybdenum shall be permitted for any part of the weldment. All used, partially used or damaged welding electrodes shall be collected on a daily basis and disposed of in a manner to be approved by the Engineer. Electrodes shall not be discarded or disposed of onto the ground.

(iv) Bevels

All pipes shall be supplied with the standard API 5L bevel.

Field preparation of pipe ends, including tie-ins, shall be to the standard API 5L bevel, using machine cutting, unless otherwise approved by the Engineer.

Bevels shall be subsequently ground to typical factory level dimensions, including variations in the height of the landing edge.

All bevels shall be power wire buffed to a bright finish just prior to welding. Grinding may be permitted to remove bevel damage.

The root face shall be at right angles to the pipe axis.

No mitred joints are allowed.

Internal tapers shall be cut as required using an internal tapering machine or by other approved method. Internal tapers shall not be flame cut.

Any laminations or other inherent manufacturing defects found during pipe end preparation shall be highlighted and corrective action taken as directed by the Engineer.

(v) Branches

The welding of branches or fittings onto pup pieces to ease installation is not permitted without the approval of the Engineer.

Holes for branches 1" and below shall be made by drilling only.

Holes for branches 1.5" and above shall be made by trepanning or flame cutting.

(vi) Pre-Heat

Pre-heating shall be provided in accordance with the welding procedure or:

- (1) If the pipe ambient temperature is less than 5°C.
- (2) If the bevel is moist or wet.
- (3) If the pipe temperature is more than 2°C below the qualification temperature.

Pre-heating shall be accomplished by a method that will not damage or contaminate the pipe or coating, i.e. propane torches or electric heating bands. The use of oxy-acetylene torches is prohibited.

Where pre-heat is required it shall be applied before tack welding and maintained until the joint is complete. The temperature of the base metal shall be monitored at all times.

Post-weld heat treatment will not normally be required on aviation fuel hydrant systems and transmission pipelines.

(vii) Alignment

Adjoining lengths of pipe shall be accurately aligned and spaced by the use of a mechanical alignment clamp. Circumferential misalignment between pipe ends prior to welding shall not exceed the limits prescribed in API 1104. Any misalignment that exceeds 1.5mm and cannot be removed by maneuvering pipes and fittings shall be referred to the Engineer for guidance on rectification.

Any materials delivered to site with dimensional variations beyond the tolerances indicated in the relevant code shall be referred to the Engineer for a ruling.

Longitudinal seam welds on adjoining ERW or SAW pipes shall be located within the top quadrant of the pipe and shall be offset by at least 200 mm. Orientation of seam welds shall however be such that branch welds or other attachments are not within the minimum distance specified.

Branches, fittings and attachments shall be sited away from other welds on the pipeline. The minimum separation shall be the largest of:

- (1) Diametre of branch or fitting.
- (2) Six times wall thickness of the thicker component.
- (3) 150mm.

Pipe work alignment shall be free from cold spring or distortion. Misalignments shall be rectified by cutting and re-welding.

Misalignment of weld joints shall be minimized by centralising and rotating pipes.

Hammering pipe to obtain line-up is to be avoided. If required, only bronze hammers with a maximum weight of 5 kg's shall be used.

The use of excessive force, heat or cold bending to achieve alignment is strictly prohibited.

Tie-ins shall be planned and executed so that any residual stress in the welded pipe section

is minimised.

The fit-up of all tie-in welds shall be inspected by the Engineer before welding commences.

Tack welds shall be deposited by qualified welders, using uphill welding in accordance with the welding procedure.

If tack welds are to be incorporated in the final weld, they shall be thoroughly cleaned of slag and ground at each end to ensure complete root continuity.

(viii) Cleanliness of Pipeline

The Contractor shall pay strict attention to ensuring that water and solid materials are not left inside or are allowed to enter the pipework during construction. It is of critical importance that the aviation hydrant system is free of internal contamination by water or debris upon filling of the system.

Pipe lengths shall always be capped or plugged with plastic end caps or blank flanges during all phases of construction, unless pipe ends are being worked on.

All end caps shall be properly and firmly sealed to prevent any ingress of dust or debris which may accumulate within the pipe line, including after lowering into the trench.

Grinding dust or flame cutting slag shall be removed from the inside of the pipe prior to replacement of end caps. Pipe stoppers shall be used to exclude such debris. Any debris inside the installed pipe shall be completely removed before the next section is welded on.

Weld slag or other debris that adheres to the pipe wall shall be removed.

After each weld is completed, a pull-trough stiff brush, pig or similar device shall be used to dislodge such material and clean the section before the next length of pipe is added.

(ix) Arc Strikes

To avoid arc strikes, the Contractor shall provide an earthing saddle at each welding site for striking the electrode to remove slag or to facilitate starting of the arc. Dimensions of earthing cables, earth stakes and earth stake installation depth shall be in accordance with the requirements of the safety management system.

Care shall be taken to ensure that arcing does not occur between the ground leads of the welding machines and the pipe or fittings. Striking the welding arc on the pipe or fittings at any point other than the welding groove is not permitted.

Arc strikes on the pipe shall be removed by grinding out until there is no evidence of a notch effect or metallurgical damage. The wall thickness shall subsequently be checked using Ultrasonic equipment. Any section found to have a thickness below the specified API 5L limits shall be replaced with a pup piece.

Repairs to arc strikes shall comply with the requirements of API 1104.

(x) Weather Limitations

The welds shall be protected from sudden variations in temperature until welds are thoroughly cool. Welding shall not be performed when weather conditions may result in any of the following:

- (1) Distortion of the welding arc.
- (2) Cooling of the welds more rapidly than was the case for procedure qualification.
- (3) Loss of shielding gas.
- (f) Entrapment of sand or dust in the weld pool.

Suitable shelters shall be used to protect welding works from weather and also to protect passing aircraft and personnel.

(xi) Completion of Welds

Any production weld in which the clamp is removed and the pipe is moved, prior to completion of the permissible amount of welding indicated in the approved procedure, shall be cut out.

For mainline welds, movement of the pipe is not permitted until the root bead is 100% complete. Movement of the pipe is also not permitted whilst welding of the hot pass is in progress.

For tie-in welds, movement of the pipe is not permitted until a minimum of 3 runs have been completed.

Notwithstanding the limiting conditions defined in the weld procedure and above, the hot pass shall be started and completed as soon as practicable after completion of the root bead.

Welding of pipe, fittings, tie-ins and repairs shall be completed in one cycle and not left incomplete overnight.

For pipe diameters exceeding 60 mm, penetration of the root bead into the bore shall not exceed 3mm (1/8"). For pipe diameters less than 60 mm (23/8") this excess penetration shall not exceed 1.5mm (1/16").

All stops and starts shall be ground and all visible defects and high points shall be removed by grinding before a further run is applied.

Each completed weld shall be thoroughly cleaned by power wire brush and all weld splatter removed prior to visual inspection. Completed welds shall have a smooth, uniform appearance.

All riser branch welds are regarded as critical welds and all NDT and other inspection results will be assessed accordingly.

Welded sections of pipe shall not be rolled or hoisted off skids or dollies until the welds are thoroughly cool.

The open ends of all pipe strings comprising of two pipes or more welded together shall be securely closed by use of approved end caps and the ends of all pipe shall be raised and placed on skids above the ground or ditch bottom at the end of each day's work and shall not be re-opened until the work recommences on that string.

All weld slag and debris shall be immediately removed from the inside of pipes upon completion of welding. Bungs or similar should be used to limit contamination of pipes.

Completed welded pipe strings shall be supported on timber skids, placed at a spacing of no more than 6 m, so that no portion of the pipe touches the ground.

The welded joints shall be left uncoated until they have been cleared by NDT.

(xii) Identification of Welds

All welds shall be permanently marked on the top quarter of the pipe with the stencil number assigned to the appropriate welder(s) and with a unique weld identification number.

Weld repairs shall retain the same number, but shall have the suffix "R" for first repair and "RR" for second repair.

The Contractor shall maintain comprehensive records of the work done by each welder. Each weld and weld repair shall be clearly marked during construction on the component being welded with water-proof paint or permanent marker to identify the following:

- (1) Welder ID.
- (2) Weld Number.
- (3) Date welded.
- (4) Date inspected.
- (5) Type of Inspection.

(j) Inspection and Testing of Production Welds

100% visual inspection and NDT is required for all welds and weld repairs. The cost of all inspection and testing, including any repairs undertaken by the Contractor, shall be to the Contractor's account.

NDT shall be carried out as soon as possible after acceptance of a weld on visual examination. A tie-in weld shall be left to stand overnight prior to non-destructive testing if the set-up procedure induces significant residual stress in the weld.

The AIA may require that any production weld from the pipe be cut out and destructively tested in accordance with API 1104. If a production test weld fails to meet the requirements of API 1104, the Engineer may issue an instruction to cease all production welding until the cause of the failure is identified. The Engineer may also direct that further production welds be tested as necessary to identify the cause of the failure.

Any disputes with regards to the interpretation of NDT results shall be referred to the Engineer, who, in consultation with the AIA, will make a final ruling to be implemented by the Contractor.

(k) Rectification of Welds

All weld repairs shall be carried out in accordance with the approved weld repair procedure. A defective weld shall be repaired or replaced within 3 working days after the date of rejection. Welds which do not comply shall be repaired in accordance with API 1104, as well as the following.

Pre-heat shall be used where this is specified in the weld repair procedure.

Cracks, other than crater cracks, shall not be repaired. The complete weld and heat affected zone shall be cut out.

Other defects may be rectified as a local repair, in accordance with the appropriate repair procedure. The complete defect shall be removed by grinding prior to effecting repair.

All repairs, except repairs of external undercuts and exposed porosity, shall be made with a minimum of two passes.

The start and stop of repair passes shall not be superimposed over the start and stop of the preceding repair pass. The start and stop of each repair pass shall be ground smooth.

Repairs shall be limited to 30% of the weld length for partial penetration repairs and 20% of the weld length for full penetration repairs.

Repair areas must be separated by at least 50 mm of acceptable weld.

Repair cavities shall be not less than 40 mm in length.

For root repairs the size and width of the parts of the weld removed by grinding shall be within the limits provided for in the repair procedure. Should a larger extent of grinding be required, the Engineer may instruct a cut-out to be undertaken.

Root sealing or single-run weld repairs are not permitted.

Excepting arc burns, defects breaking the outer surface shall be removed by grinding, which may be left without subsequent welding if approved by the AIA and if both of the following conditions are satisfied:

- (1) The affected part of the weld is properly blended into the contour of the weld.
- (2) The remaining wall thickness exceeds the pipe nominal wall thickness immediately adjacent to the defect. Wall thickness to be confirmed by Ultrasonic testing.

If the conditions in (2) are not satisfied the full extent shall be re-welded.

Repaired welds shall be subjected to the same level of inspection and NDT as the original weld.

For normal duty pipelines a second repair may be made, thereafter the weld shall be completely removed. The Engineer may instruct the Contractor to undertake a cut-out of the affected pipeline section.

PSS 1.6 LAYING OF LINE PIPE

(a) Scheduling of Works

Trench excavations shall commence only upon completion of all unstabilised, granular layerworks to the new taxiways and aprons.

(b) Setting Out

The location, co-ordinates and elevations for all survey benchmarks, including local control stations, shall be identified by the Contractor prior to commencement of setting out the works. A list of benchmarks and control stations shall be issued to the Engineer for review.

The Contractor shall be responsible for the protection of all such bench marks and control stations for the duration of the works. Any permanent survey marks or indicators removed, disturbed or destroyed shall be restored at the Contractor's expense.

The trench reference line shall be marked with stakes. Stakes shall remain until removed during the trenching operation. The location of the centerline of the pipeline, including each horizontal deflection point, shall be pegged and staked by the Contractor.

The Contractor shall identify from available drawings and expose by careful hand excavation any buried services or facilities crossing the pipeline within 5 m of any excavation. The location of such services or facilities shall be clearly identified by wooden stakes, which shall be appropriately

labelled.

The vertical alignment of the pipeline shall follow the lines and levels indicated on the alignment sheet. The main hydrant pipeline shall be laid to a grade of no shallower than 1:250, draining towards the indicated low points. The invert levels of the pipeline shall be set out at intervals of no more than 5m, to prevent any depressions or unwanted low points along the installed pipe sections.

The pipeline shall be laid to the following tolerances:

X-Y Position : $\pm 150\text{mm}$, measured along the crown of the pipeline.
Elevation : $\pm 25\text{mm}$ of the indicated invert level

(c) Stringing

The Contractor shall take all necessary precautions to prevent flooding of the works and shall take positive measures to prevent the ingress of water or dirt into the pipeline sections, including the provision of end caps and blanks to all exposed pipe ends.

Pipe shall be strung only in cleared and graded areas of the Right-of-Way with sufficient space and access. Strung pipe shall be supported at least 150 mm clear off the ground and in a manner that will not damage the pipe or coating.

No pipe shall be strung within 100 m of any area where blasting may be required.

Special precautions are to be taken and extreme care exercised where stringing operations are carried out in the vicinity of overhead power lines.

(d) Excavation, Bedding and Backfilling

Excavation, bedding and backfilling of the pipeline shall be in accordance with the details shown on the drawings and Particular Specification as per Chapter 2 of the COTO.

Excavation of pipe trenches shall not be undertaken prior to completion of welding and coating, including testing and acceptance of the pipe strings for lowering in, unless blasting is required.

(e) Lowering In and Laying of Pipeline

Before being lowered into the trench, the pipe shall be thoroughly cleaned and inspected to ensure that

no foreign material has entered the pipe string. Blowing out with compressed air may be used for this purpose, although this may not always be successful and other means of cleaning may be required.

Coated pipe shall be handled with approved lowering-in belts of approved synthetic material. The use of steel cables or chains is prohibited.

Holiday detection testing shall be carried out on the entire coating immediately prior to the pipe entering the trench, in accordance with Particular Specification PSS 3.4 (e)

Lowering in shall not proceed without the prior approval of the Engineer.

Stresses induced in the pipeline during lowering-in shall be minimized. The Contractor shall provide adequate side booms or similar lifting equipment to ensure that the pipeline sections are not unduly flexed during lifting and lowering operations.

Undue stress shall also not be imposed in the course of fit-up and welding of successive pipe strings within or above the pipe trench.

PSS 1.7 PRESSURE TESTING, CLEANING AND DRYING

(a) General

The Contractor shall be responsible for the procurement of all equipment, plant and labour required for pressure testing of the completed pipeline sections. The provisions of API 1594 shall apply and the following further requirements shall be met:

- (i) The test pressure shall be 24 Barg.
- (ii) The test duration shall be 24 hours.

Use of a rust-inhibitor, oxygen scavenger or biocide is not required.

The pipeline section to be tested shall be backfilled prior to the commencement of tests and prior to installation of the isolation valves (VC13) and the high and low-point assemblies. The hydrant valve take-offs shall be closed with blanking flanges at the risers, with valves installed temporarily to allow removal of air and bleeding off of water. At no stage shall any pressure test be conducted against a permanently installed shut valve. The pipeline shall be tested in two sections, as shown in

Figure 1 below.

Potable water may be obtained from a fire hydrant nearest to the launching end, as confirmed with the Employer.

The number of post-test welds (“golden” welds) shall be minimized as far as possible. All such welds shall be subject to visual inspection and 100% NDT testing.

Unapproved “golden” welds will invalidate the pressure test and require retesting of the affected pipe section or valve assembly unless a prior written concession is received from the Engineer.

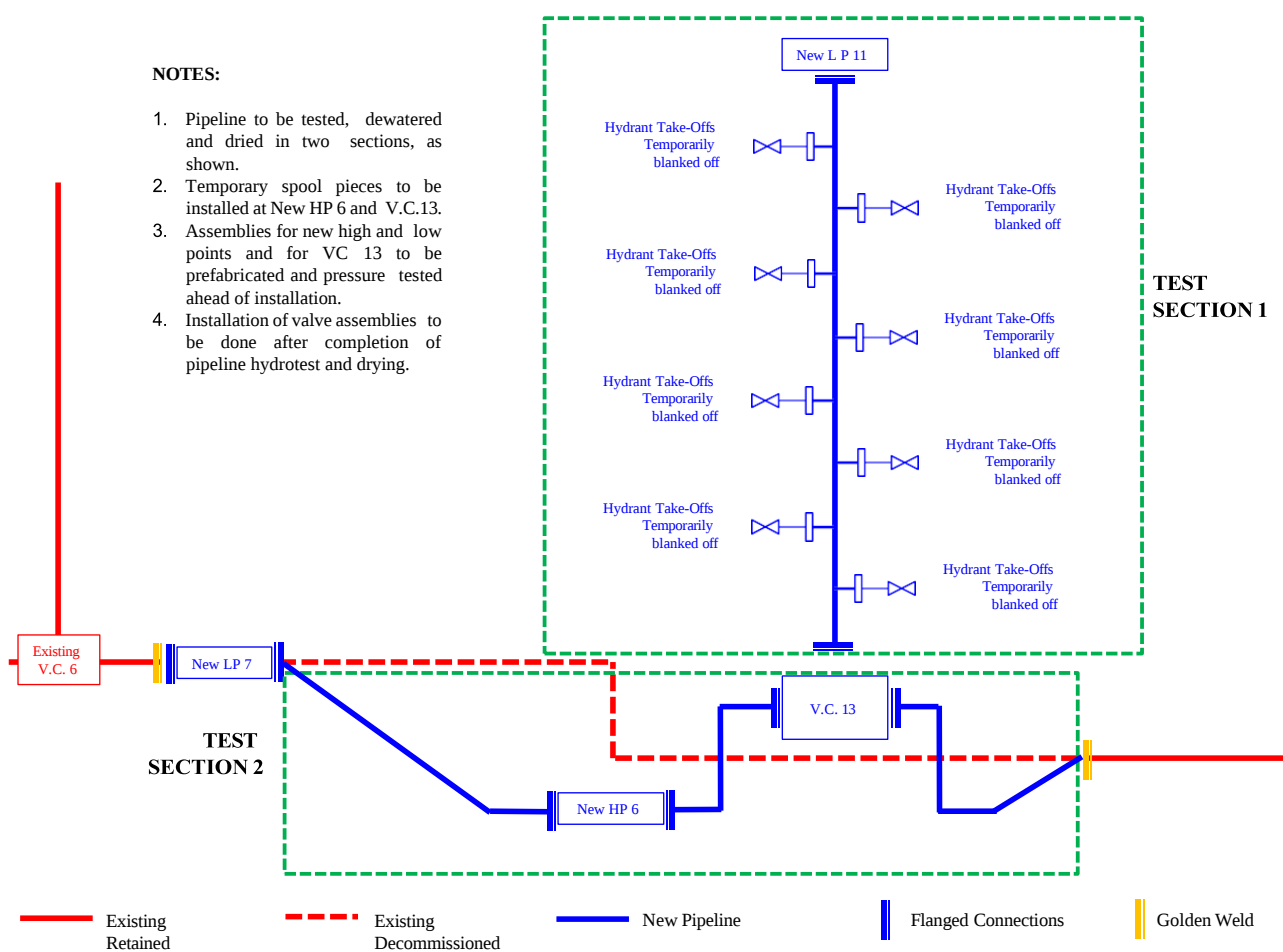


Figure 1 : Hydrotest

(b) Safety

Prior to the commencement of testing, the Contractor shall ensure that adequate emergency procedures are in place to take account of the additional associated risks. The Contractor's personnel shall be properly inducted and prepared for the implementation of such procedures, taking account of the following particular risks:

- (i) The emission of water and air at high pressure will result in high levels of dust and noise.
- (ii) Warning notices and adequate signage shall be provided and adequate notification must be given to the Engineer and Employer prior to any dewatering or cleaning operations.
- (iii) All temporary pig launchers and receivers must be pre-tested to the same standard as the pipeline. These tests are to be verified by the AIA.
- (iv) Precautions shall be taken to properly secure all temporary hoses to prevent "whipping".
- (v) Pig receivers used during cleaning of the lines shall be provided with cages, to prevent pigs from shooting out at the receiving end.
- (vi) Barricading shall be provided around the test area, including launching and receiving ends.
- (vii) Proper means of communication shall be provided to ensure effective communication between personnel during filling, testing, dewatering, drying, filling and flushing operations.

(c) Test Procedure

The Contractor shall submit to the Engineer for approval, a minimum of 30 days before hydrostatic testing, his hydrostatic test procedures and method statements including, but not limited to, the following:

- (i) List of personnel to undertake testing, including CV of testing supervisor.
- (ii) List of test equipment to be utilised.
- (iii) Activity lists for testing and dewatering of lines.
- (iv) Calibration certificates for equipment, including pressure and flow meters.
- (v) Isometric drawings for high pressure testing heads, to include all temporary pipe work for pig launching and receiving, as well as all points for filling, testing, draining, applying backpressure and venting, as well as all pressure gauges and flow meters and associated piping.
- (vi) Isometric and shop drawings showing for all low pressure test heads, including pig launchers and receivers.
- (vii) Methods to be utilised for filling of the pipeline and for draining and disposal of water.
- (viii) Safety procedures.

- (ix) Format of records to be kept for filling, testing and dewatering.

The Engineer shall be notified 14 days in advance of the hydrostatic tests.

The Contractor shall submit a certified report in an approved format of the test to the Engineer within five days of the test, including all hydrostatic test data and records.

(d) Equipment

The Contractor shall design, fabricate and test the sending and receiving heads for all pigging, filling, testing, dewatering and drying operations. All welds and pipework for the sending and receiving heads shall be subject to 100% radiography or MPI testing. The following further equipment shall be provided:

- (i) SANAS certified 24-hour pressure strip-chart recorder, including associated pressure gauges.
- (ii) Manual pressure gauges, to be fitted to launching and receiving heads for rapid field checking purposes.
- (iii) High-pressure launching and receiving heads, for pressure testing of pipeline.
- (iii) Low-pressure heads for pig launching and receiving during drying operations, including caged pig catcher.
- (iv) High-volume pump for filling of pipeline.
- (v) Low-volume pump for final pressurization of pipeline.
- (vi) Accurate water meters for filling and final pressure testing of pipeline.
- (vii) All hosing, fittings, end caps, blank flanges, valves and the like, required for testing, dewatering and drying purposes, including temporary vent and drain connections.
- (viii) Temporary storage tanks for filling of pipeline, with adequate capacity to allow continuous filling operations.
- (ix) Adequate lighting to allow for 24-hour operations.
- (x) Compressor to maintain back pressure during filling and dewatering of the line subsequent to completion of the test.
- (xi) Desiccant drying equipment, capable of producing dry air at -40°C dew point.
- (xii) Safety barriers and warning signs, as required.

The Contractor shall also provide expert supervision, skilled and unskilled labour as required for the safe and proper execution of the testing operations.

(e) Filling of Pipeline

The Contractor shall ensure that a continuous supply of water is available to allow for the continuous filling of the pipeline. An elevated storage tank (15m³ minimum) shall be provided, from which water shall be extracted via the filling pump into the pipeline. The location and elevation of the elevated storage tank shall be in accordance with the air-side operational requirements as defined by the Employer.

A poly-pig shall be inserted in the pipeline to avert the entrapment of air into the pipeline, with back-pressure applied and controlled from the far end of the filling operations. At no stage shall filling be allowed to proceed unless a sufficient positive head of water is maintained upstream of the filling pump.

A calibrated water metre shall be installed between the elevated storage tank and the filling pump and readings shall be taken at no more than five minute intervals for the full fill duration. The rate of filling shall be maintained at a rate of approximately 500m per hour. The filling rate shall be controlled by adjustments to the inlet pressure via the filling pump at the launching head and by applying adequate back pressure with compressed air at the receiving end.

(f) Pressure Test

Once the pipeline has been filled and all air removed the filling pumps shall be disconnected and the high-pressure pump installed. All piping required for the pressure recorder and associated equipment shall also be installed and checked by the Engineer prior to commencement of pressurization.

The rate of pressurization shall be maintained at an initial rate of approximately 1 bar per minute, reducing to 0.5 Bar per minute near to final pressurization. Hold periods of 30 minutes shall be made to allow for checking of air content at 60% and 90% of the final test pressure.

The Contractor shall manually record on suitably-scaled graph paper the amounts of water introduced into the pipeline versus the increase in pressure observed per litre of water added and the slope of the filling curve shall be carefully monitored. This should follow a straight line.

The required test pressure shall be held and monitored using the strip chart recorder and pressure gauges, for the durations as stipulated under PSS 1.7 (a).

The test shall be witnessed by the Engineer and AIA. The pressure test will be deemed to have been successfully completed if the test pressure has been maintained for the stipulated duration. The tolerance of the test pressure shall be ± 0.5 Bar.

The Contractor shall provide a test report, to include the following:

- (i) Description of section tested, including accurate description of extent and battery limits for the test.
- (ii) Confirmation of specified operating and test pressure, as well as test duration.
- (iii) The pressure-time chart for the test shall be included in the report.
- (iv) Calculations, including theoretical and actual volumes of water used to fill the line.
- (v) Record of water volumes added per unit of time.
- (vi) Any incidents or anomalies shall be reported.

(g) Dewatering

Following successful completion of the pressure test, the pipeline shall be dewatered and dried. The Contractor shall carefully release the pressure in the pipeline and disconnect the tubing at the high-pressure sending head. The Contractor shall connect suitable discharge hoses to the supply connection to allow water to be discharged.

The Contractor shall then connect the compressor to the receiving end and, with the discharge valve in the shut position, open the pig draw valve and apply sufficient pneumatic pressure to move the filling pig towards the sending head. Water shall be discharged to the nearest water course or stormwater drains, in accordance with the Environmental Management Plan, without causing flooding of the pipe trench or damage to adjoining property. Where necessary the water shall be dispersed by splash plates, to prevent erosion.

Once the filling pig has passed beyond the running valve at the sending head, the high-pressure heads shall be cut off and replaced with the low pressure heads for final drying. The Contractor shall send successive swabbing and low-density foam pigs through the line to ensure complete displacement of water in the pipeline, prior to final drying, until no further water is detected on the foam pigs.

(h) Final Drying of Pipeline

Within no more than five working days after completion of the pressure test and dewatering of the pipeline, further drying shall be undertaken, using a desiccant dryer in conjunction with an oil-free compressor. Multiple swabbing and foam pigs shall be sent through the pipeline until a dew point of no more than -20°C is measured at the receiving end. The speed of the swabbing pig is to be controlled through the applied pressure in front of and behind the pig.

PSS 1.8 DECOMMISSIONING OF EXISTING PIPELINE SECTION AND REMOVAL OF EXISTING LOW POINT 7 AND HIGH POINT 6

(a) Decommissioning of Existing Pipeline

The existing fuel line between existing VC 6 and VC 7 shall be drained, purged with nitrogen, vented with dry air and rendered safe for work. This shall include air quality monitoring during venting of the pipeline section; to verify the absence of hydrocarbon fumes and certify that residual nitrogen levels are below safe limits prior to commencement of any further works to the existing pipeline. This work will be executed by the Contractor in conjunction with the Employer. The cost of these works will be covered by a provisional sum.

(b) Demolition of Existing High and Low Points

Following the certification of safe working conditions as described above, the existing valve assemblies at LP 7 and HP 6 shall be removed. This shall include cold-cutting the existing pipeline immediately outside of the concrete valve chambers and removal of equipment., demolition of the existing concrete roof and walls, disassembly of the existing valve assemblies and removal of all concrete rubble and reinforcing.

All piping and mechanical equipment shall be handed over to the Employer at a designated storage area within the airport precinct. All building rubble shall be disposed of by the Contractor at a duly licensed solid waste disposal site.

(c) Decommissioning of Existing Pipeline Section

The existing pipeline sections that are to be decommissioned shall be exposed and cut in sections of no more than 50m length and filled with a bentonite-cement grout (mix proportions 20:1). Filling shall start from the lowest point, using an inserted HDPE filling pipe, to be extracted towards the high point. The Contractor shall provide all mixing plant and pumps as required. The moisture content and consistency of the grout shall be monitored to maintain adequate flow characteristics, without adding excessive amounts of water.

PSS 1.9 DRAINING AND FLUSHING OF EXISTING AND NEW PIPELINES

Draining, filling and flushing of the existing and new pipelines with aviation fuel will be undertaken by the Employer, including agents of the Employer. The Contractor will be required to provide assistance to the Employer, which will be reimbursed on a time and cost basis.

Preceding final commissioning of the pipeline, piping and valve installations and acceptance by the Engineer, all installations shall be filled with Jet A1 fuel and flushed, before final handover to the

Employer. Flushing will be done from the existing to the new lines after the new lines have been filled, with fuel being discharged from the most distant, downstream control valve or low point manifold to temporary tankage. The fuel will be inspected and samples taken and tested by the Employer or his authorized independent testing authority.

The fuel will be supplied by the Employer. The minimum flushing volume will be 3 times the volume of the new pipeline, with an expected maximum of 6 times this volume, to be pumped at the maximum discharge rate. Any additional flushing volumes will be for the Contractor's account.

PSS 1.10 AS-BUILT DATA

The Contractor shall on a daily basis gather, collate, index, store and subsequently hand over all documentation to the Engineer for review and acceptance upon completion of the works. The documentation and welding records shall be kept up to date at all times and accurately reflect the status of welds, welders, NDT traceability, repairs and welder rejection rates.

The as-built records shall cover all aspects of the works, to include, but not limited to, the following:

- (i) All procedures and method statements developed by the Contractor, including all associated QA/QC documentation.
- (ii) Comprehensive list of pipes and bends delivered to site, including manufacturer details and all records of tests undertaken by the manufacturer. Marked-up as-built drawings, indicating assigned numbering and location of welds (X-Y co-ordinates and elevations).
- (iii) Comprehensive weld records, including approved welding procedures, records of welder qualification, inspection reports and radiographic films.
- (iv) A pipe book shall be provided in Excel format, detailing the heat numbers of installed pipes, the weld numbers to either side of the pipe, co-ordinates of the welds and reference number of welders executing the work.
- (v) Inspection reports for all holiday detection.
- (vi) Calibration certificates for equipment and reports for pressure testing of pipeline.
- (vii) Detailed survey of all installed infrastructure, including XYZ coordinates of the top of pipe, welds, bends, valves, connection to Cathodic Protection infrastructure, new installed electrical and earthing infrastructure, as well as the location of any other equipment or connections installed onto the pipeline. The survey is to be handed over in an electronic database format where survey data points are properly referenced and labelled to allow interpretation of information.
- (viii) The as-built data shall be submitted in hard copy and electronic .pdf, data base and native format and shall be neatly indexed and referenced to facilitate easy retrieval of information. The indexing of the as-built data shall be agreed with the Engineer prior to submission of the as-built data.

PSS 1.11 MEASUREMENT AND PAYMENT

PSS 1.11.3 Supply and Install Line Pipe and Bends

The unit of measurement shall be the plan view metre length of pipeline installed, excluding the valve assemblies for the isolation valves, hydrant valves and low point stations, which shall be measured and paid separately under Particular Specification PSS 2. Separate payment will not be made for any excess pipe lengths required for test heads, wastage or other temporary works, which shall be deemed to be included in the rates.

The tendered rate shall cover all costs and resources required for the complete supply and installation of line pipes and bends, as described also in these Particular Specifications PSS2, including, but not limited to, the following:

- (1) Procurement of line pipe and bends, including delivery to site, stockpiling, handling and transportation of pipe.
- (2) External coating, coating inspections, holiday detection and coating repairs of line pipe and bends.
- (3) Internal lining, coating inspections and repairs of line pipe and bends.
- (4) Field inspections for external and internal coatings.
- (5) Welding and lowering-in of line pipe and bends.
- (6) Temporary protection of pipelines and bends, including provision of end caps.
- (7) All costs attached to development of welding procedures and welder qualification.
- (8) All further method statements as specified or required.
- (9) All QA/QC activities and documentation, including, but not limited to, destructive and non-destructive testing for pipe welding, including cost of third-party inspections by Contractor.
- (10) Provision of all records to be issued to Engineer, including, but not limited to, procedures, method statements, material data sheets, as-built welding and coating data, drawings and inspection records.

Trenching, preparation of trench bottom, bedding, backfilling and compaction shall be measured and paid for under Chapter 2 of the COTO.

Payment for the fabrication and installation of all valves and valve stations shall be made under Particular Specification PSS 2.

PSS 1.11.4 Pressure Testing, Cleaning and Drying of New Line Pipe

Payment for hydrotesting, cleaning and drying of the line pipe and bends, to include the blanked-off hydrant risers, will be made as a lump sum, upon successful completion of these works for each section, as listed above, and final sign-off by the Engineer and AIA.

The tendered rate shall include all costs and resources required for the successful completion of the hydrotest, cleaning and drying of the line pipe, including bends and risers, as described in these Particular Specifications, to include, but not limited to, the following:

- (i) Development of approved procedures and method statements for testing, cleaning and drying of pipe lines.
- (ii) Fabrication, testing, installation and final disposal of all low- and high-pressure testing and cleaning heads.
- (iii) Procurement of water from designated take-off point, including all temporary pipelines, pumps and storage tanks.
- (iv) All plant, labour and equipment required for testing, cleaning and drying of the pipelines.

PSS 1.11.5 Commissioning Works (Night works)

A portion of the works covered in this section are to be carried out as night works (22:00 to 04:00). Rates are to include all additional costs including but not limited to lighting costs, power supply/generators etc.

The following services are included under this section:

- (i) Nitrogen purging of new pipelines (Night Works)
- (ii) Nitrogen purging of new pipelines (Normal Hours)
- (iii) Appointment of AIA, as nominated by Employer
- (iv) Provide assistance with filling and flushing of new pipelines
- (v) Provide assistance with soak testing of new pipelines : VC6 to VC13, VC13 to VC7, VC13 to LP11
- (vi) Pigging of new 16" pipeline (Night Works)
- (vii) Pigging of new 16" pipeline (Normal Hours)

The tendered rate for items (iv) and (v) shall cover all costs and resources required including, but not limited to:

- (1) Labourers
- (2) Charge hand
- (3) Junior/Senior Foreman
- (4) Artisan
- (5) Flagmen

- (6) Surveyor
- (7) Fitter
- (8) Fitter Assistant
- (9) Safety Watch
- (10) Rigger
- (11) Rigger Assistant

Payment will be made on the basis of the tendered rates. No additional costs for nightworks/overtime will be accommodated.

Where applicable, payment will be made on the certified invoice value plus the percentage mark-up as tendered.

PSS2 : SUPPLY, FABRICATION, INSTALLATION AND TESTING OF VALVES AND ANCILLARIES

PSS 2.1 SCOPE

This specification covers the procurement of all valves, valve box covers and associated materials for the installation of the following valves that are to be installed in conjunction with the new apron and taxiway. The works will be undertaken within an operational airport area and include the following.

- (i) Actuated and non-actuated isolation valves (16" and 6"), including valve station covers, ladders, associated installations and accessories at new valve chamber VC 13.
- (ii) New Low Point stations LP 7 and LP 11, including valve station cover, associated installations and accessories.
- (iii) New High Point Station HP 6, including valve station cover, associated installations and accessories.
- (iv) Hydrant pit valves and valve boxes, including associated installations and accessories.

This specification shall be read in conjunction with the following further particular specifications:

- (i) Particular Specification PSS 1 : Supply, Install and Test Steel Pipelines and Ancillaries
- (ii) Particular Specification PSS 3 : Coating.

Other contractors may be appointed by the Engineer or Employer to undertake inspections and tests, additional to the QA/QC tests and inspections undertaken by the Contractor. This may include, but is not limited to, the Authorized Inspection Authority (AIA), to conduct audits on all QA/QC procedures, welding and pressure testing.

The Contractor shall provide unencumbered access to persons employed by such third parties and shall furnish all records reasonably required by such third parties in the execution of their duties.

PSS 2.2 SUPPORTING SPECIFICATIONS AND CODES

The standard specifications and codes applicable to the works shall include the following, as well as any further codes and specifications referenced therein.

Table 3 : Applicable Standards

Standard Number	Title
API Standards	
API 5B	Specification for Threading, Gauging and Thread Inspection of Casing, Tubing and Line Pipe Threads
API 5L	Specification for Line Pipe
API 5L3	Conducting Drop Weight Test on Line Pipe
API 5L8	Field Inspection of New Line Pipe
API 6D	Specification for Pipeline and Piping Valves
API 6FA	Fire Test for Valves
API 598	Valve Inspection and Testing
API 1104	Welding of Pipelines and Related Facilities
API RP 5C6	Welding Connections to Pipe
API RP 1110	Recommended Practice for the Pressure Testing of Steel Pipelines for the Transportation of Gas, Petroleum Gas, Hazardous Liquids, Highly Volatile Liquids or Carbon Dioxide
API 1594	Initial pressure strength testing of airport fuel hydrant systems with water
ASTM Standards	
ASTM A105	Standard Specification for Carbon Steel Forgings for Piping Applications
ASTM A193	Standard Specification for Alloy-Steel and Stainless Steel Bolting for High Temperature or High Pressure Service and Other Special Purpose Applications
ASTM A194 / A194M	Carbon and Alloy Steel Nuts for Bolts for High Pressure or High Temperature Service, or Both
ASTM A 216	Standard Specification for Steel Castings, Carbon, Suitable for Fusion Welding, for High-Temperature Service
ASTM A234/A234M	Standard Specification for Piping Fittings of Wrought Carbon Steel and Alloy Steel for Moderate and High Temperature Service

ASTM A370	Standard Test Methods and Definitions for Mechanical Testing of Steel Products
ASTM E384	Standard Test Method for Micro-indentation Hardness of Materials
ASTM A395	Standard Specification for Ferritic Ductile Iron Pressure-Retaining Castings for Use at Elevated Temperatures
ASTM 694	Carbon and Alloy Steel Forgings for Pipe Flanges, Fittings, Valves and Parts for High Pressure Transmission Service
ASME Standards	
ASME B16.5	Pipe Flanges and Flanged Fittings: NPS 1/2 through NPS 24 Metric/Inch Standard
ASME B16.9	Factory-Made Wrought Butt welding Fittings
ASME B16.10	Face to Face and End-to-End Dimensions of Valves
ASME B16.11	Forged Fittings, Socket-Welding and Threaded
ASME B16.21	Non-metallic Flat Gaskets For Pipe Flanges
ASME B16.34	Valves- Flanged, Threaded and Welding End
ASME B16.49	Factory Made Wrought Steel, Butt welding Induction Bends for Transportation and Distribution Systems
ASME B31.3	Process Piping
ASME B31.4	Pipeline Transportation Systems for Liquids and Slurries
BS/EN Standards	
BS EN 124-1	Gully tops and manhole tops for vehicular and pedestrian areas. Definitions, classification, general principles of design, performance requirements and test methods
BS EN 124-2	Gully tops and manhole tops for vehicular and pedestrian areas. Gully tops and manhole tops made of cast iron
BS 2751	General purpose acrylonitrile-butadiene rubber compounds. Specification
BS 3799	Specification for steel pipe fittings, screwed and socket-welding for the petroleum industry

BS ISO 6336-5	Calculation of load capacity of spur and helical gears. Strength and quality of materials
BS EN 1759-1	Flanges and their joints. Circular flanges for pipes, valves, fittings and accessories, class-designated. Steel flanges, NPS 1/2 to 24 (Previously BS 1560-3.1
BS EN 10204	Metallic products. Types of inspection documents
BS EN 10253-2	Butt-welding pipe fittings. Non alloy and ferritic alloy steels with specific inspection requirements (Previously BS 1640-1 and BS 1640-3)
BS EN 10253-3 BS EN 10253-4	Butt-welding pipe fittings. Wrought austenitic and austenitic-ferritic (duplex) stainless steels without specific inspection requirements (Previously BS 1640-2 and BS 1640-4)
EI Standards	
EI 1540	Design, Construction, Operation and Maintenance of Aviation Fueling Facilities
EI 1542	Identification markings for dedicated aviation fuel manufacturing and distribution facilities, airport storage and mobile fueling equipment
EI 1581	Specifications and laboratory qualification procedures for aviation fuel filter/water separators
EI 1583	Laboratory tests and minimum performance levels for aviation fuel filter monitors
EI 1584	Four-inch hydrant system components and arrangements
EI 1585	Guidance in the cleaning of aviation fuel hydrant systems at airports
EI 1590	Specifications and qualification procedures for aviation fuel microfilters
Further Specifications	
SANS 0111	Engineering Drawings
SANS ISO 9001	Quality Management Systems - Requirements
SANS ISO 9002	Quality systems - Model for Quality Assurance in Production, Installation and Servicing
97/23/EG	European Pressure Equipment Directive

IP MCoSP Part 2	Design, construction and operation of petroleum distribution installations
NACE SP0286	Electrical Isolation of Cathodically Protected Pipelines
NFPA 30	Flammable and Combustible Liquids Code
CSN EN 13463-1	Non-electrical equipment for potentially explosive atmospheres - Part 1: Basic method and requirements
CSN EN 13464-5	Non-electrical equipment intended for use in potentially explosive atmospheres - Part 5: Protection by constructional safety ""c""

The latest revision of the standardized specifications as listed above shall be applicable. The sequential order of precedence for the applicable codes, standards, specifications and regulatory requirements shall be as follows:

- (i) Government acts and regulations.
- (ii) Employer project guidelines, specifications and standards.
- (iii) South African standards.
- (iv) International standards.

In the event of an inconsistency, conflict or discrepancy between any of the standards, specifications and regulations, the most stringent and safest requirement shall prevail. Any inconsistencies critical to the design and construction shall be brought to the attention of the Employer for resolution, prior to construction.

PSS 2.3 MATERIALS

(a) General

All materials for the valve, hydrant and low point stations shall be supplied and installed by the Contractor.

The Contractor shall check the delivery times of all items required for the works. Any late or critical items shall be highlighted to the Engineer. The status shall be checked progressively by active expediting of deliveries by the Contractor and the Engineer shall be kept continuously informed. Long lead items are to be imported via airfreight. The following items are identified as potential long lead items:

- (i) Isolation Valve Cover, including ladders (Dabico)

- (ii) Low Point Valve Box Cover (Norinco)
- (iii) High Point Valve Box Cover (Norinco)
- (iv) Hydrant Valve Box (including valve, Lay Flat Type : JIG Operations Bulletin 90)

The Contractor shall be solely responsible for the control of all materials and equipment for the duration of the Contract. Any damaged materials or equipment shall be promptly replaced or repaired at the Contractor's expense and as instructed by the Engineer.

Before accepting any piping, fittings or other items of equipment, the Contractor shall carry out a thorough inspection to ensure that materials have been delivered undamaged as ordered. Deliveries shall be checked for the following:

- (i) Identification, as specified on the order.
- (ii) Certification, as specified on the order.
- (iii) Material, schedule and rating.
- (iv) Electrical equipment cable entries shall be plugged or capped.
- (v) Particular attention shall be given to fragile equipment and items that may be damaged if not packed correctly.
- (vi) Quantity delivered to correspond with order.
- (vii) Each item of equipment, e.g. valves, shall have a weatherproof label firmly wired on, detailing the order and reference number.

The Contractor shall store all piping, fittings, valves and equipment so that no damage occurs prior to installation. Where practical, items shall be stored in lockable containers for protection from weather and pilferage.

All piping, fittings and equipment stored outside or awaiting installation shall be protected from weather using plastic sheeting firmly tied or weighted down to prevent any hazards at airside areas.

(b) Isolation Valves and Associated Installations

- (i) 16" Isolation Valves

All 16" isolation valves shall be expanded plug, reduced bore, double block and bleed type, providing zero-leakage, with positive up and downstream shut-off. The valves shall be suitable for isolation of aviation fuel hydrants. The following further requirements shall apply:

- (1) Bleed points are required between upstream and downstream seal located within the body of the valve.
- (2) Thermal relief of body cavity is required on the upstream side when the valve is closed.
- (3) No automatic relief to atmosphere is allowed.
- (4) Valves shall be fire safe to API 6FA.
- (5) Asbestos is forbidden
- (6) Flanges shall be raised and in accordance with ASME B16.5 with a 150# rating.
- (7) Electrical actuators are required.
- (8) Valves shall have visual, mechanical position indicator, directly connected to the valve stem.
- (9) Manual bleed valves with thermal relief (DTR) to be provided.

Material specifications shall be as indicated in Table 4. Documentation and certification shall be provided as listed in Table 5.

Table 4 : Valve Material Specification

Part	Specification
Body	ASTM A 216-WCC
Plug	ASTM A 216-WCC or ASTM A395 Gr.60-40-18. ENP coated
Bonnet/Lower Plate	ASTM A 216 WCC or ASTM A516 Gr.70 (plate material)
Bolts and Nuts	ASTM A193-B7 / A194-2H
Slips	ASTM A395 Gr. 60-40-18 (Ductile iron) Manganese Phosphate coated
Seals and O-Rings	Viton GF

Table 5 : Valve Documentation and Certification

Element	Requirement
Materials Certification	BS EN 10204 for manufacturers standard traceable components
Testing	BS EN 10204
Fire safe	To API-6FA
Declaration of conformity	European Pressure Equipment Directive (97/23/EG). Vendor to provide evidence of approval under this directive at the time of the quotations.

- (ii) Actuators

Electrical actuators shall meet the following requirements:

- (1) Actuators shall be “Rotork IQ Pro’ range – 400 V AC type.
- (2) The model selection shall suit the valves as supplied.
- (3) Actuators shall be fitted to the valves and shall be delivered as part of the valve assemblies.
- (4) Enclosure rating shall be Ex9d) and IP68. The necessary certification shall; be submitted to the Engineer.
- (5) The supply shall include three infra-red setting tools and shall include for the delayed setting up, programming and commissioning of valves on site.

(c) Ball Valves

All isolation valves smaller than 80 NB shall be full bore, short pattern, soft sealed ball valves, incorporating anti-static design to eliminate static electricity. The materials shall be as follows, or approved equivalent:

- (i) Body : Carbon steel to ASTM A216-WCB
- (ii) Ball : Stainless Steel L AISI 304
- (iii) Seal : PTFE

(d) Fuel Hydrant Pit Valves

- (i) General Specification

Hydrant pit valves shall meet the following specifications:

- (1) Valves shall be manufactured in full compliance with EI 1584.
- (2) The rated flow capacity shall be 4 542 litres per minute.
- (3) The maximum safe working pressure shall be 19.2 Bar, with a hydrostatic test pressure of 28 Bar
- (4) Valves shall have a 4” API adaptor
- (5) Valves shall be fitted with a lanyard dual pilot valve with ANSI 150# 4” base flange.
- (6) Pressure drop shall not exceed 1.25 Bar.
- (7) Opening time 0-90% of full flow to occur within five to ten seconds.
- (8) Closing time shall be 3-5 seconds at 4 500 litre per minute.
- (9) Maximum temperature rating shall be 60°C, minimum temperature -10°C.

(ii) Materials

Materials shall comply with the following requirements:

- (1) Body : Ductile iron, internally lined with Copon EA 2217 or similar approved.
The valve shall have an external acrylic paint finish.
- (2) API adaptor : Stainless steel.
- (3) Pilot valve : Stainless steel and aluminium alloy.
- (4) Seals PTDE, fluorcarbon and high nitrile.
- (5) 4" (ANSI 150#) to 6" (ANSIO 300#) spool pieces must be included.
- (6) Stone guard strainer required.

(iii) Documentation

The following documentation shall be provided:

- (1) All material certificates.
- (2) Factory acceptance test certificates.
- (3) All data sheets.

(e) Hydrant Valve Pit Boxes

Hydrant valve pit boxes shall be of the lay-flat type, as described in JIG (Joint Inspection Group) Information Bulletin No 90 of May 2016. All hydrant pit covers shall be tethered or permanently connected to the pits.

Hydrant valve pit boxes shall comprise of a two piece construction, comprising of an inner welded section welded to the hydrant riser and an outer section cast into the apron paving, allowing relative movement between the pavement and hydrant riser of + 25 mm vertical and + 35 mm horizontal.

A flexible, high-integrity seal shall be fitted between the inner and outer box. The pit box shall have a hinged lid of aluminium construction, suitable to withstand aircraft loads of up to 900 kN The lid shall be retained to the box by means of a strap to prevent dislodging due to jet blast. A locking device on the lid is not required.

The assembly shall have a clear opening of at least 457mm (18") with the hinged lid in the open position.

The hinged pit lid shall be provided with a seal compliant with the following:

(i) Material

- (1) Material to be UV and fuel resistant.
- (2) The material shall be such that the lid and frame are completely water proof.
- (3) Integral frame : Cast aluminium.
- (4) Hinged pit lid : Cast aluminium.
- (5) Pit box inner and outer body : Carbon steel to BS ISO 6336-5 : 43A, 4 mm thick.
- (6) Riser pipe : 6" to API 5L Grade B Standard Weight.
- (7) Base flange : ASTM A105, NPS 6, Class 300.
- (8) Flexible and door seals : Aviation fuel resistant Nitrile to BS 2751.

(ii) Coatings

Coatings shall be as follows:

- (1) Inner surface of pit box : Carboline 187 or Copon EA4 2217 (light grey to BS 00 A06)
- (2) Outer surfaces of pit box and riser pipe : Two-part epoxy Tematar or Intertuf.
- (3) Riser pipe bore : : Carboline 187 or Copon EA 2217 (light grey to BS 00 A06).

(iii) Fabrication and Testing

Fabrication and testing shall be to the following requirements:

- (1) Riser Pipe : to ASME B31.4.
- (2) 100% radiography on all butt welds.
- (3) Riser pressure tested to 28 Bar.

(iv) Documentation

The following documentation shall be provided :

- (1) Material certificates for all components.
- (2) Pressure test certificate.
- (3) Certificate of compliance with coating application in accordance with coating supplier requirements.
- (4) Supplier data sheet.

(v) Special Tools and Installation Kits

Special tools and installation kits shall be supplied with all pit boxes.

The supplier, through the Contractor, shall advise of any specific requirements that need to be followed and adhered to with regard to the storage and preservation of the materials, equipment and tools, removal from storage area, handling and movement around site, temporary storage protection and laying down, installation and maintenance of the product.

(f) Covers and Ladders for Isolation and Low Point Valve Chambers

(i) Covers

Covers for the valve chambers shall be aluminium Cavotec Dabico Type DAB-38 or approved equivalent. The access cover assembly shall include an aluminium, one-hand-lift, torsion- actuated cover, including extension handrail, safety post, chain assembly and removable grating platform. The hinged cover shall be rated for aircraft wheel loads of up to 900 kN and shall have a lift weight of approximately 12 kg, opening to 90°. The hinged cover shall have inside dimensions of 965x965mm.

High visibility inserts shall be fitted to both sides of the cover, rated for aircraft wheel loads of up to 900 kN.

Covers shall be cast into the roof of the valve chambers, in accordance with the cover manufacturer's instructions. The top of the frame of the cover shall be slightly proud of the final concrete surface, to prevent ingress of water. A proprietary sealing system shall be provided to prevent the ingress of water or dirt into the valve chambers. The covers and frames shall also be certified in accordance with the following standards:

- (1) CSN EN 13463-1.
- (2) CSN EN 13464-5.

The Contractor shall take particular care in handling covers during shipment, transportation and installation, which shall be in strict accordance with the manufacturer's instructions.

(ii) Ladders

Ladders shall be provided at VC13 only, as shown on the drawings and shall be Caveco Dabico Type DAB-38WP vault ladder extension or similar approved. The following requirements shall be met:

- (1) Ladders shall be 425mm wide with a rung height of 305mm.
- (2) The ladder frame shall be 1" Sched.40 carbon steel tube, coated orange.
- (3) Rungs shall be of pressed steel, coated orange.

Ladders shall be fixed to the cover and the walls and floors of the chamber, in accordance with the manufacturer's specification. Provision shall be made for an adjustable floor-mounting bracket and for temporary extension of the ladder above the pit, whilst the chamber is being accessed.

(g) Covers for High and Low Points

Manhole covers and frames shall be of ductile iron, in compliance with BS EN 124-1 and BS EN 124-2 and be rated to Type F900 for aircraft loading. Covers and frames shall be circular with an 800mm diameter clear opening and with a closed keyways. The cover shall be permanently hinged to the frame.

(h) Ancillary Piping and Fittings

Table 6 below lists the ancillary piping and fittings required at for the valve chambers, hydrant valves and low points.

Table 6 : Ancillary Piping and Fittings

Item	Description	Code
Valve Chamber 13		
Tee-Piece	Equal Tee 16" Sch.40	ASTM A234 Gr WPB, ANSI B16.9 BE
	1 1/2" - 150# WNRF	ASTM A105, ANSI B16.5

Flanges	1+1/2" - 150# WNRF Long Neck	ASTM A105, ANSI B16.5
	16" - 150# WNRF	ASTM A105, ANSI B16.5
Spacer	16" 25mm Sch.40	ASTM A234 Gr WPB, ANSI B16.9 BE
Weldolets	1+1/2" 150# Sch40	ASTM A234 Gr WPB, ANSI B16.9 BE
Gaskets	3" Spiral Wound	ANSI 304 SS, F.G. ANSI B16.20
	16" Klingsil C4430	BS 7531 Gr. AX, BS 5146
Studs	1/2" UNC, 75mm long	ANSI B16.10, ANSI B16.5
	5/8" UNC, 100mm long	ANSI B16.10, ANSI B16.5
	7/8" UNC Stepped Stud, 110 mm long	ASTM A105, ANSI B16.5
	7/8" UNC Stepped Stud, 140mm long	ASTM A105, ANSI B16.5
	7/8" UNC, 175mm long	ASTM A105, ANSI B16.5
	7/8" UNC, 180mm long	ASTM A105, ANSI B16.5
Nuts	1/2" 2H	ANSI B16.10, ANSI B16.5
	5/8" 2H	ANSI B16.10, ANSI B16.5
	7/8" 2H	ASTM A105, ANSI B16.5
Washers	5/8"	ANSI B16.10, ANSI B16.5
	7/8"	ASTM A105, ANSI B16.5
	7/8", Insulating Washers	ASTM A105, ANSI B16.5
Hydrant Valves		
Piping	Pipe 6" Wall Thickness 7.1mm C/S	API 5L Grade B (Std)
Reducer	Concentric 6" x 4" Sch.40	ASTM A234 Gr.WPB, ANSI B16.9 BE
Flanges	Slip On 4" - 150# FF	ASTM A105, ANSI B16.5
	6" - 300# WNRF	ASTM A105, ANSI B16.5
	Slip On Flange 6" - 300# WNRF	ASTM A105, ANSI B16.5
Gaskets	4" Klinger Topchem 2000	BS 7531 Gr.AX, BS 5146
Studs	5/8" UNC 90mm long	ANSI B16.10, ANSI B16.5
Low Points		
Piping	1/2" STD SMLS Stainless Steel	SA-182 F 316L, ANSI B16.5
	1 1/2" STD SMLS Stainless Steel	SA-182 F 316L, ANSI B16.5
	16" Wall Thickness 9.5 mm C/S	API 5L Gr.B
	Concentric 10" x 6" Sch.40	ASTM A234 Gr WPB, ANSI B16.9 BE

Reducers	Concentric 16" x 10" Sch.40	ASTM A234 Gr WPB, ANSI B16.9 BE
Flanges	Blank 1/2" - 150# RF, Stainless Steel	SA-182 F 316L, ANSI B16.5
	Slip On 1/2" 150# RF	SA-182 F 316L, ANSI B16.5
	1 1/2" - 150# WNRF Stainless Steel	SA-182 F 316L, ANSI B16.5
	Blank 1 1/2" - 150# RF Stainless Steel	SA-182 F 316L, ANSI B16.5
	6" - 150# WNRF	ASTM A105, ANSI B16.5
Elbows	1 1/2" - 45° BW Sched.40	SA-182 F 316L, ANSI B16.9 BE
	16" - 90° BW Sched.40	ASTM A234 Gr WPB, ANSI B16.9 BE
	16" - 22.5° BW Sched.40	ASTM A234 Gr WPB, ANSI B16.9 BE
End Cap	16" Sched.40	ASTM A234 Gr WPB, ANSI B16.9 BE
Weldolet	6" - 150# Sched.40	ASTM A234 Gr WPB, ANSI B16.9 BE
Dustcap	25mm Camlock and Dustcap	ASTM A312, Gr TP316L
Gaskets	1/2" Spiral Wound	ANSI 304 SS, F.G. ANSI B16.20
	1 1/2" Spiral Wound	ANSI 304 SS, F.G. ANSI B16.20
	6" Spiral Wound	ANSI 304 SS, F.G. ANSI B16.20
Studs	1/2" UNC Stainless Steel	SA-182 F 316L, ANSI B16.5
Item	Description	Code
	3/4" UNC 110mm long Stainless Steel	ASTM A312 Gr TP316L
	7/8" UNC 155mm long Galvanized	ANSI B16.10, ANSI B16.5
Nuts	1/2" 2H Stainless Steel	SA-182 F 316L, ANSI B16.5
	7/8" 2H Galvanized	ANSI B16.10, ANSI B16.5
Washers	1/2"	SA-182 F 316L, ANSI B16.5
	3/4" Stainless Steel	ASTM A312 Gr TP316L
	7/8" Galvanized	ANSI B16.10, ANSI B16.5
New High Point 6		
Piping	1/2" STD SMLS Stainless Steel	ASTM A312, Gr TP316L
	6" Pipe Wall Thickness 7.1mm C/S	API 5L Gr.B
Reducers	Concentric 1" x 1/2" Sch,40 Stainless Steel	ASTM A312, Gr TP316L, ANSI B16.9
	Blank 1/2" - 150# RF, Stainless Steel	ASTM A312, Gr TP316L, ANSI B16.5
	1 1/2" - 150# WNRF	ASTM A312, Gr TP316L, ANSI B16.5
	6" - 150# WNRF	ASTM A105, ANSI B16.5

Flanges	Blank Flange 6"-150# RF, Stainless Steel	ASTM A312, Gr TP316L, ANSI B16.5
Nipple	1" STD Stainless Steel	ASTM A312, Gr TP316L
Dustcap	25mm Camlock and Dustcap	ASTM A312, Gr TP316L
Gaskets	1 1/2" Spiral Wound	ANSI 304 SS, F.G. ANSI B16.20
	6" Spiral Wound	ANSI 304 SS, F.G. ANSI B16.20
Studs	1/2" UNC Stainless Steel	ASTM A312, Gr TP316L
Nuts	1/2" Stainless Steel	ASTM A312, Gr TP316L
	3/4" 2H, Stainless Steel	ASTM A312, Gr TP316L
Washers	1/2", 3/4" Stainless Steel	ASTM A312, Gr TP316L
Pit Box		
Piping	6" Pipe Wall Thickness 7.1mm C/S	API 5L Gr.B
Reducer	Concentric 6" x 4" Sch.40	ASTM A234 Gr.WPB, ANSI B16.9 BE
Flange	6" - 300# WNRF	ASTM A105, ANSI B16.5
	6" Slip On - 300# RF	ASTM A105, ANSI B16.5
	4" Slip On - 300# FF	ASTM A105, ANSI B16.5
Item	Description	Code
Gaskets	6" Spiral Wound	ANSI 304 SS, F.G. ANSI B16.20
	4" Spiral Wound	ANSI 304 SS, F.G. ANSI B16.20
Studs	1/2" UNC Stainless Steel	ASTM A312, Gr TP316L
Nuts	3/4" 2H, Stainless Steel	ASTM A312, Gr TP316L
Washers	1/2", 3/4" Stainless Steel	ASTM A312, Gr TP316L

PSS 2.4 PLANT, LABOUR AND EQUIPMENT

(a) General

The Contractor shall assess working area requirements and present plans of work areas, including material lay-down and storage areas, to the Engineer, all in accordance with the HSE and permitting systems as stipulated by the Employer and/or Engineer.

High standards of housekeeping will be required, in strict compliance with the permits and permit conditions to be issued by the Employer.

The Contractor shall provide all staff, plant and equipment, including adequate support staff, tools, implements and materials on Site to perform the works in accordance with the standards as set forth in these Specifications, and at the production rates required to meet the approved completion dates.

(b) Safety

The Contractor shall be responsible for ensuring that all work associated with welding is carried out safely, without hazard to personnel, plant, equipment or airport operations. All work shall be carried out strictly in accordance with the requirements and restrictions of the work permits issued for each task. All operations shall be covered by and comply with the Project Safety Management Plan and Specifications, as well as the Employer's particular operational and safety requirements. The Contractor shall observe the safety requirements relating to radiography and working with purge gases. Personal protective equipment appropriate for welding operations shall also be provided to all personnel engaged in such activities.

(c) Fabrication and Installation Team

The resources to be provided by the Contractor for the fabrication and installation of the valves, covers and ancillary works shall, as a minimum, include, but not be limited to, the following:

(i) Supervisory Staff and Qualified Welders

- (1) Senior fabrication foreman.
- (2) Welding team.
- (3) Inspection and testing teams.
- (4) Coating team.
- (5) Pressure testing team.

(ii) Plant and Equipment

- (1) Trucks for transporting valves and valve assemblies.
- (2) Lifting equipment for lowering-in and installation of valve assemblies and valve covers.
- (3) Welding machines.

- (4) Equipment for pressure testing.
- (5) NDT equipment.

PSS 2.5 WELDING

The provisions of PSS 1.5 shall apply as applicable.

PSS 2.6 INSTALLATIONS

(a) General

All isolation valve, hydrant valve, low point and high point assemblies shall be pre-fabricated, coated and cleaned before attaching them to the fuel hydrant pipeline system to minimise in-situ contamination.

The valve assemblies shall be fully protected during construction of the surrounding concrete enclosures, to include temporary supports, wrapping, as appropriate and use of temporary covers of timber, plywood or sheet steel.

On completion the surface of the permanent lid and internal surface of concrete valve boxes shall be perfectly clean, dry and free of any concrete spatter or other extraneous matter.

Strict supervision shall be maintained by the Contractor when handling piping, valves, valve assemblies or equipment. Particular attention shall be given to using appropriate lifting equipment and lifting gear and slings. All lifting gear shall be regularly inspected for signs of wear and damage. Due care shall be taken when placing slings that the manufacturer's coatings or ancillary items are not damaged during lifting and handling.

Valves, piping and assemblies shall preferably be handled using heavy canvass or rubber slings, not less than 200mm wide. The use of steel chains or wire rope shall be permitted only where purpose- designed lifting hooks, brackets or spreader beams are provided. Under no circumstances shall direct metal contact be made or the coating damaged in any way.

The Contractor shall ensure that all valves and equipment are installed in the correct flow direction. Any queries shall be immediately addressed with the Engineer.

Where similar sized spools are to be installed, e.g. for valve chamber temporary spools, the

spools shall be match marked to ensure that they will be installed in the exact, original position.

(b) Hydrant Valve, Valve Box and Riser Installations

(i) Branch Connections for Hydrant Valves

The Contractor shall plan construction activities to allow for the removal of coupons, swarf and debris. To facilitate NDT inspection and improve strength, branch internals shall be dressed when accessible and debris subsequently removed.

Reinforced branch connections shall be UT, MPI (or Dye Penetrant) and visually inspected for defects before the reinforcement pad is installed and welded out.

(ii) Setting Out

It is essential that hydrant ground boxes and the base flanges within them are installed true square and at the correct elevation to each other in relation to the finished apron level. If not square, the valves within the box will be inoperable. If the box is installed too low, water ponding will occur and flood the box. If installed too high, the box will experience excessive shock loading from planes and vehicles as they drive over the box.

If the correct dimension between the base flange and top of the ground box is not maintained, problems may be experienced with the ground box cover clashing with the valve or the valve being too deep to allow coupling with the dispenser intake coupling.

The height of the valve and valve box shall be set accurately to be slightly proud of level of the completed concrete pavement, to prevent later ingress of water. All levels are to be approved by the Engineer prior to installation before cutting risers and setting boxes and valves to their final level.

The Contractor shall provide all survey instruments required for setting out and checking of the positions and elevations of hydrant risers and ground boxes and shall carefully measure all elevations and check the levels at each stage of installation. All finished pavement levels shall be checked and agreed with the Engineer prior to installation and shall be recorded on the as-built drawings. This shall include the following:

- (1) Location of risers.
- (2) Check to verify that risers are true vertical.
- (3) Elevation of base flanges.
- (4) Elevation of ground boxes.

Survey instruments shall also be made available to the Engineer for further checking, if deemed necessary.

Any rework necessary due to misalignment of the hydrant valve and valve boxes shall be to the Contractor's account.

(iii) Installation

Hydrant valves and valve boxes shall be installed strictly in accordance with the drawings and the installation instructions of the hydrant valve and valve box suppliers.

To avoid entry of water or debris falling into the open risers, the Contractor shall ensure that risers are never left open. They shall always be capped, plugged or blanked off, as appropriate.

Risers will normally be located in areas with construction traffic. The Contractor shall ensure that all risers are clearly and prominently demarcated, with robust temporary surrounds, e.g. drums filled with concrete.

The temporary base blind flange attached to the valve shall be removed and the valve installed in strict accordance with the manufacturer's installation instructions.

The bonding strap between the hydrant box and base flange shall not be damaged and shall be installed as shown on the drawings

All weld inspections pressure testing, coating, reinstatement and leak testing of the valve and box installation shall be completed prior to completing the surrounding concrete works. Particular attention shall also be given to the following:

- (1) All flange faces and fittings shall be clean and undamaged prior to installation.

- (2) All gaskets shall be new. The material, size and thickness of gaskets shall be checked prior to installation.
- (3) Stone guards shall be retained, as designed by the manufacturer.

(c) Low Points

Low points shall be fitted with a minimum 40 mm (1.5") manual valve connection, suitable for the

attachment of a flushing hose rated for the full pressure of the hydrant system.

It is critical to avoid interference (or excessive clearance) between the 40mm riser pipe and the sump.

Isolation flange sets (Klingersill C4430) and spark gaps shall be installed complete with central flat or oval section gaskets, insulation sleeves, and insulating and plated steel back-up washers.

The dimension between the base flange and the bottom of the sump shall be measured by the Contractor and checked by the Engineer at each low point and recorded accordingly on the as-built drawings.

Where multiple low points are to be installed, each low point assembly shall be uniquely identified during fabrication to ensure that it is inserted in the correct low point and cannot be swapped with a different low point assembly.

Each low point assembly shall be inspected prior to insertion, to ensure that the 40mm riser pipe has been welded into the base flange at the correct dimension without distortion, i.e. the 40mm riser will run parallel inside the 150mm low point riser and not "hang up" on the end of the sump or otherwise.

(d) Welded Attachments

Where it is necessary to weld other attachments to the pipe work (e.g. for cathodic protection, lugs, pipe support brackets or trunnions) the material of the attachment shall be compatible with the pipe work and be welded on by an approved welder, in accordance with an approved weld procedure.

Weld attachments onto pipe work shall be subjected to 100% NDT.

(e) Flanges

Pipe work is to be installed as indicated on the drawings. Additional flanged joints and fittings may only be included with the approval of the Engineer.

To avoid the risk of leaks contaminating the ground, all underground flanged or threaded joints shall be housed within a sealed concrete valve chamber or ground box. Direct burying of flanges is strictly prohibited.

To avoid water collection and dirt hang-up on slip-on flanges, the Contractor shall set up and weld out slip on flanges as specified. The bottom quadrant (4.30 to 7.30) of the internal filler shall be infilled with weld metal to bring the weld near flush with the flange face.

All flanges must be perfectly parallel with all studs tightened equally before being drawn up with torque wrenches. Taper gauges shall be used to ensure that there is a uniform gap before and after final tightening of the studs.

Flange connections shall be boxed up to the specified torque by means of an approved torque wrench. Studs are to be tightened according to the specified cross-over pattern.

No connection of flanges may be made unless the AIA has performed the dimensional checks and recorded the dimensions. All torque valves shall be witnessed and recorded by the AIA.

Flanges shall not be coated internally.

(f) Gaskets and Bolting

The Contractor shall ensure that gaskets and bolting are of the correct size and materials, as specified.

Gaskets are to be installed centrally, without damage to the gasket. No grease or other compound shall be used to hold the gasket in place prior to tightening of studs.

All nuts and stud bolts shall be dipped in graphite oil before assembly. Correctly sized and installed stud bolts shall have between 1 and 2 threads projecting the nut face. Short or long

bolts shall be replaced. All joints are to be pulled up evenly.

(g) Threaded Joints

Threaded joints shall be to API 5L, unless stated otherwise, The Contractor shall ensure that all taps, dies and threading equipment are regularly inspected and maintained to a high standard.

Virgin PTFE tape shall be used on all threaded joints. Particular care is required to tape joints correctly and ensure that pieces of tape do not enter the pipe work.

(h) Cathodic Protection (CP)

The CP system for underground pipelines shall include a monitoring point at VC 13 and isolation flanges to be provided at this station, as well as at the new low- and high point stations, as well as continuity cables at each of these stations, as described in further detail below.

i. Monitoring Points at Valve Station

The monitoring points at VC 13 shall be as shown on the drawings and shall include the following:

- (1) "York" type enclosure for termination of cables.
- (2) IR-Free Cu/CuSO₄ reference electrode.
- (3) Coupon, to be manufactured from 32 mm² steel rod, 80 mm long. Two 6 mm² PVC/PVC blue cables shall be soldered onto the back of the coupon. The whole assembly shall then be potted in a suitable epoxy. After the epoxy has set, the front face of the coupon shall be polished on 1000 grit emery paper. Once this is complete, the interface between the steel rod and the epoxy shall be coated with a thin lacquer to prevent a crevice forming.
- (4) 2x20mm² doubly-insulated copper cables, connecting the "York" enclosure to the reference electrode and coupon.
- (5) 110mm HDPE Sleeve with 100x50mm T-piece to accommodate copper cables. A "Roxtec" seal is to be provided around the sleeve within the concrete wall of the valve chamber.

ii. Insulating Flanges

Insulating flange kits (Klingsil C4430) shall be installed at the valve and low point

stations, to include the insulating gasket, insulating sleeves and insulating washers. Flanges shall be installed in strict accordance with the manufacturer's instructions.

A spark gap shall be installed across each insulating flange . Spark gaps shall be suitable for bridging insulating flanges in cathodically protected pipe sections within hazardous areas and shall be certified in accordance with ATEX directive 94/9/EC.

The insulating sleeves shall be tightly installed within the flange bolt holes, filling the space between the stud and the flange. It is therefore critical that flanges are properly aligned. This applies in particular to cases where temporary spool pieces are installed.

The annular space between flanges must be kept free of debris, since this can result in electrical contact and short-out of the flange.

Once the joint is fully assembled and the joint has been electrically tested, the annular space between the flange faces shall be filled with hot or cold electrical compound and the outer perimeter of the flanges taped with a 0.5mm thick PVC tape. All electrical continuity testing of cross-bonds and spark gaps shall be witnessed by the Engineer.

Any painting applied over the insulated kit shall be non-conductive.

iii. Cross-Bonding of CP System

In order to ensure continuity of the CP protection across insulating flanges, cross-bonding cables shall be installed between the incoming pipe section and each outgoing section. Two 20mm² doubly-insulated PVC/PVC copper cables shall be provided for each cross-bond.

Each cable shall be installed within a 32mm PVC conduit, fixed to the wall of the valve chamber. The cable ends at the incoming and outgoing ends shall be exothermically (Thermit) welded to the pipeline within the valve stations. The coating to the pipe at the connection points shall be made good in accordance with the coating specifications (PSS 3).

PSS 2.7 PRESSURE TESTING OF VALVE ASSEMBLIES

All installed piping and valves forming part of the hydrant, isolation valve, low and high point installations shall be hydrostatically tested prior to installation of the fabricated assemblies. Hydrotesting shall be in accordance with ASME B31.4 and the further requirements as set

forth below. The test pressure shall be 22.5 Bar and the test duration shall be 4 hours.

A preliminary test, using air at no more than 170 kPa gauge pressure, may be made prior to hydrostatic testing to locate any major leaks. Precautions shall be taken to avoid excessive pressure due to thermal expansion during the test period.

All fabricated assemblies shall be checked to determine the best method of filling and draining the assemblies without any air entrapment or vacuums, to ensure that the entire system can be completely filled and drained.

All joints which are flanged, screwed, brazed or welded, shall be left unpainted for examination during leak testing. All valves shall be in the half-open position.

Temporary blank flanges or end caps shall be fitted to the ends of fabricated assemblies as required. Provision shall be made for venting the assembly by use of temporary stopcocks where required. All temporary flanges, end caps, gaskets and stopcocks shall have the same pressure rating as the assembly that is to be tested. The cost of such items shall be included in the scheduled rates for testing of valve assemblies.

All pressure gauges shall be calibrated and certified at least every three months. The calibration of all gauges shall be traceable to a national or international standard and the calibration certificates must be available during leak testing.

The pressure range of the pressure gauge shall not be less than 1½ times, but not more than twice, the test pressure monitored. Where electronic gauges are used, the calibration frequency shall not exceed 12 months and the test pressure shall be between 20 and 80 percent of the gauge range.

The surface metal temperature and test water during the hydrostatic test shall not be lower than 5°C.

A minimum of two pressure gauges shall be used. One pressure gauge shall be located at grade near the leak test pump and another pressure gauge shall be mounted at the high point of the system. Pressure test manifolds shall be constructed in such a way that pressure test gauges are provided with block valves and vents in order to zero gauges.

During hydrostatic or pneumatic testing, care shall be exercised not to exceed the specified test pressure.

The pressure shall be gradually raised to an initial pressure of approximately 25% of the

test pressure and held for a minimum of ten minutes. All welded, bonded, threaded, flanged and packed joints shall be inspected for leaks before bringing up the final test pressure.

Records shall be made of each piping system during testing, to include:

- (i) Date, time and duration of test.
- (ii) Identification of all piping and equipment included in the test.
- (iii) Test pressure.
- (iv) Minimum ambient and test medium temperature.
- (v) Pressure gauge serial numbers, calibration dates and gauge ranges to be recorded.
- (vi) Approval by AIA.

All records certifying completion of testing shall be included in the as-built handover documentation.

In the event that any repairs are made following the pressure test, the affected piping shall be retested at the pressures originally specified for the test.

All valve assemblies shall be drained upon completion of testing. Care shall be exercised in draining vessels to avoid creation of a vacuum. The drained system shall be further dried by venting with compressed air. Suitable filters shall be fitted to the compressor to prevent contamination by water, dust or oil during such venting operations.

Temporary end caps shall be provided at the open ends of the valve assemblies, to be removed only immediately prior to final installation of the assemblies.

PSS 2.8 FUEL LEAK TEST

Subsequent to the completion of the pipeline and valve installations and following the filling of the lines, a fuel leak test shall be performed. After the line has been filled with fuel, the line shall be pressurized to 1 500 kPa and all flanged connections shall be inspected for leaks.

The duration of the pressure test must be at least 1 hour. The isolation valves must be used to isolate the pipe sections and the test shall thus verify that the isolation valves function properly.

On successful completion of the fuel leak test flushing of the system may commence.

PSS 2.9 AS-BUILT RECORDS

The Contractor shall on a daily basis gather, collate, index, store and subsequently hand over all documentation to the Engineer for review and acceptance upon completion of the works. These records shall be kept up to date at all times and accurately reflect the status of welding, fabrication, installation and testing. The as-built records shall cover all aspects of the works, to include, but not limited to, the following:

- (i) All procedures and method statements developed by the Contractor, including all associated QA/QC documentation.
- (ii) Comprehensive list of valves, covers and further materials delivered to site, including all materials, fabrication and coating details, records of tests undertaken by the manufacturer, operating and maintenance instructions.
- (iii) Marked-up as-built drawings, indicating assigned numbering and location of welds.
- (iv) Comprehensive weld records, including approved welding procedures, records of welder qualification, inspection reports, radiographic films.
- (v) Record of all coating inspections and test results.
- (vi) Inspection record for all CP installations.

The as-built data shall be submitted in hard copy and electronic (pdf) format and shall be neatly indexed and referenced to facilitate easy retrieval of information. The indexing of the as-built data shall be agreed with the Engineer prior to submission of the as-built data.

PSS 2.10 MEASUREMENT AND PAYMENT

PSS 2.10.1 Procurement of Materials

The Contractor shall provide all materials as listed below and in accordance with these Particular Specifications. The tendered rate shall include all costs for the procurement of the materials, including, but not limited to, the following:

- (i) Sourcing of materials.
- (ii) Transport and storage on site.
- (iii) All coatings, as per manufacturer's requirements or as specified under Particular Specification PSS3.
- (iv) All certification, test certificates, supporting documentation, operating and maintenance manuals.
- (v) One year operational spares, as recommended by the supplier or manufacturer.

The fabrication, installation and testing of valve assemblies and ancillaries shall be separately measured and paid.

PSS 2.10.2 Fabrication, Testing and Installation of Valve Assemblies (Night Works)

All of the works covered in this section are to be carried out as night works.

The tendered rate shall cover all work required for the fabrication, inspection, testing, coating, installation and final handover of the valve assemblies, including hydrant boxes, covers and ladders to the isolation valve chambers and covers to the low point chambers, as shown on the drawings and as described in these specifications.

The rate shall include all plant, labour and equipment required to execute the work, including any incidental materials for both the permanent and any temporary works.

PSS 2.10.3 Fabrication, Testing and Installation of Valve Assemblies (Night Works)

All of the works covered in this section are to be carried out as night works.

The tendered rate shall cover all work required for the fabrication, inspection, testing, coating, installation and final handover of the valve assemblies, including hydrant boxes, covers and ladders to the isolation valve chambers and covers to the low point chambers, as shown on the drawings and as described in these specifications.

The rate shall include all plant, labour and equipment required to execute the work, including any incidental materials for both the permanent and any temporary works.

PSS 3 COATING

PSS 3.1 SCOPE

These Specifications cover the following coating systems:

- (i) Coating of exposed piping and equipment at valve stations.
- (ii) External coating of line pipe.
- (iii) Internal coating of line pipe, bends and hydrant risers.

PSS 3.2 SUPPORTING SPECIFICATIONS AND CODES

The standard specifications and codes applicable to the works shall include the following, as well as any

further codes and specifications referenced therein.

Table 7 : Applicable Standards

Standard Number	Title
ASTM Standards	
ASTM D570	Standard Test Method for Water Absorption of Plastics
ASTM D1000	Standard Test Methods for Pressure-Sensitive Adhesive-Coated Tapes Used for Electrical and Electronic Applications
ASTM E96/E96M	Standard Test Methods for Water Vapour Transmission of Materials
ASTM G62-14	Standard Test Methods for Holiday Detection in Pipeline Coatings
ASME Standards	
ASME B46.1	Surface Texture (Surface Roughness, Waviness, and Lay)
SABS/SANS Standards	
SABS SM 141	Dry film thickness of paint coatings by means of electromagnetic flux or eddy current type gauges
SANS 121	Hot dip galvanized coatings on fabricated iron and steel articles - Specifications and test methods
SANS 1091	National colour standard
SANS 1217	Internal and external organic coating protection for buried steel pipelines
SANS 5767	Cleanliness of blast-cleaned steel surfaces for painting (assessed by pictorial standards)
SANS 5769	Cleanliness of blast-cleaned steel surfaces for painting (assessed by freedom from dust and debris)
SANS 5771	Preparation of steel substrates before the application of paints and related products - Test for the assessment of cleanliness of blast-cleaned steel surfaces - Detection of residual millscale
SANS 10064	The preparation of steel surfaces for coating
SANS 10129	Plastics tape wrapping of steel pipelines

SANS 10140-1	Identification colour marking Part 1: General
SANS 10140-2	identification colour marking Part 2: Identification of hazards and equipment in work situations
Other Standards	
BS EN ISO 8503	Preparation of steel substrates before application of paints and related products
BS EN ISO 2409	Paints and Varnishes. Cross-Cut Test
SIS 05 59 00	Preparation Of Steel Substrates Before Application Of Paints & Related Products - Visual Assessment Of Surface Cleanliness
SSPC-SP1	Surface Preparation Standard No. 1: Solvent Cleaning
SSPC-SP2	Surface Preparation Specification No. 2: Hand Tool Cleaning (St.2)
SSPC-SP3	Power Tool Clean (St.3)
SSPC-SP6	Commercial Blast Cleaning (Sa.2)
SSPC-SP3	Near-White Blast Cleaning (Sa.2.5)

The latest revision of the standardized specifications as listed above shall be applicable. The sequential order of precedence for the applicable codes, standards, specifications and regulatory requirements shall be as follows:

- (i) Government acts and regulations.
- (ii) Employer project guidelines, specifications and standards.
- (iii) South African standards.
- (iv) International standards.

In the event of an inconsistency, conflict or discrepancy between any of the standards, specifications and regulations, the most stringent and safest requirement shall prevail. Any inconsistencies critical to the design and construction shall be brought to the attention of the Employer for resolution, prior to construction.

PSS 3.3 COATING OF PIPING AND EQUIPMENT

(a) General Requirements

This Particular Specification PSS3.3 covers all new external pipework and valve assemblies for VC 13, Low Points 7 and 11, High Point 6 and the new hydrant valve stations, which will not be externally coated by tape wrapping, as described in Particular Specification PSS3.4

The following materials, items or surfaces do not require any surface preparation, shop or field coating, unless otherwise specified:

- (i) Aluminium.
- (ii) Brass.
- (iii) Concrete and masonry.
- (iv) Copper.
- (v) Nickel.
- (vi) Stainless steel (austentic).
- (viii) Glass.
- (ix) Plastic.

Precautions shall be taken to prevent coatings from being applied to equipment and name plates, instrument glasses and gauge dials, couplings, shafts, flanges and nozzle facings, valve stems, bearings, bolt threads and other machined surfaces.

All work shall be executed in a neat and workmanlike manner and in strict accordance with this specification and as defined on the drawings. No changes or deviations shall be made from this specification without the written approval of the Engineer.

The paint manufacturer shall be consulted for his recommendations regarding storage and application of his products, with particular reference to storage on site. These recommendations shall form part of this specification. Storage limitation on maximum and minimum temperatures, humidity protection, shelf life and the like shall be strictly adhered to.

Painted steel components shall preferably not be stored in contact with each other. When practicable they shall be separate by softwood or other suitable material. Stacked items shall have a timber contact area sufficiently large to avoid damage to the coatings, taking account of the deadweight of steelwork stacked on the packing. Separation materials shall be reasonably clean and free of any contaminating agents which could adversely affect the coatings. Steelwork shall not become distorted in stacking.

Shop fabricators and equipment vendors shall ensure that the coatings on their supplied equipment are suitable to withstand without more than superficial deterioration adverse environments during transport, shipping and storage.

Coatings unable to withstand rough handling shall also be protected by suitable means. Full details of the coating systems and means of protection shall be submitted to the Engineer for approval.

The coating subcontractor shall ensure that work is carried out at all times with adequate light for the particular task.

The Contractor shall ensure that there is adequate ventilation and that working conditions and equipment in general are at all times conducive to the production of high class work.

The coating subcontractor shall, after selecting the paint application equipment, conduct a paint application procedure trial with his applicators. The compatibility of the equipment, materials and personnel shall be established to the satisfaction of the Engineer before work proceeds. Further trials may be required in the event of changes.

With coatings sensitive to moisture, the coating subcontractor shall provide means for measuring the dew point at the work site, as well as contact thermometers for measuring the temperature of steel. No coating shall be applied to steel which has a temperature of less than 3°C above the dew point.

Where the coating subcontractor deems it necessary to provide surface heating of the steel, this shall be achieved by means of indirect heating, e.g. hot air blowers. In all cases the paint manufacturer's recommendation shall be adhered to.

All final surface preparation or coating application shall be suspended if conditions arise where dust or other pollutants contaminate the surface. Affected surfaces shall be further cleaned and prepared before paint is applied.

In areas where surface preparation, painting or other processes are proceeding simultaneously or are likely to cause contamination, precautions shall be taken to ensure that prepared surfaces or surfaces with wet coating are not contaminated. In the case of shop preparation and painting, the two processes shall be protected against contamination at all times.

Bolting, nuts and other connections shall have standard corrosion protection at least equal to that provided

for the general surfaces.

All surfaces which are to rest on finished concrete or other floors or timber, or which will be inaccessible after assembly or erection, shall receive the full specified coating system prior to assembly or erection. The responsibility for ensuring compliance shall rest with the Contractor.

The coating subcontractor shall be wholly responsible for surface preparation and primer application. The primed surfaces shall meet the minimum dry film thickness as stated in this specification.

Control panels, instruments, electrical equipment, valves and the like shall be delivered to the site with the manufacturer's finish. Jobsite painting shall be subject to confirmation by test that additional paint is compatible.

(b) Valve Chamber Pipework and Fittings

Underground valve chamber pipework, fittings and valves are to be painted using a paint system as approved by the Engineer.

Particular care shall be taken to ensure thorough preparation of the works. This shall include masking of all items that are not to be painted, e.g. valve stems, manufacturer's labels and items or equipment that have been supplied finish painted. In the case of any doubt regarding the extent of painting requirements, reference shall be made to the Engineer.

Paint systems shall be robust, impervious to water, non-degradable, resistant to aviation fuel, suitable for underground use (damp or occasionally flooded conditions) and field application.

Insulation flanges shall be painted with a non-conductive paint.

(c) Underground Special Coatings

This section applies to the protection of underground pipework and fittings where wrapping tape or shrink sleeves are impractical or liable to be ineffective. Alternative coatings for uses other than specified below must be approved by the Engineer in writing before use.

(i) Hydrant Pit Boxes

If any damage occurs to the internal or external paintwork on hydrant pit boxes before the installation is complete and accepted, the coating subcontractor shall repair the paint system using paint and methods specified by the hydrant pit box manufacturer.

(ii) Hydrant Pit Box Base Flanges

Hydrant pit box base flanges are to be protected using the approved paint system. The preparation is to

be by power wire brushing. Paint application shall be as specified by the manufacturer. Mechanical wire brush shall be to SSPC-SP3 : Grade St 3.

Once the paint system is completed and cured, wrapping of the hydrant riser can be completed to produce a minimum overlap of 50mm.

The coating subcontractor shall ensure that hydrant risers, riser box flange and pit box boot collars are coated and inspected in strict conformance with the specifications and drawings.

Adjoining tape wrapping on risers shall overlap the Plascothane coating by at least 50mm.

The compatibility of existing coatings with new coatings shall be checked with the paint manufacturer before purchase and use.

The coating subcontractor shall supply all materials, labour, plant, equipment and protective clothing to execute the work in accordance with this specification.

(d) Surface Preparation for Painting

Prior to abrasive blasting, all critical equipment which may be damaged by blast, dust or particulate matter, shall be suitably protected by wrapping, taping or other means to prevent damage. This equipment shall include, but not be limited to, rotating shafts, bearings, valves, machined moving parts and motors.

Surface preparation by removal of all millscale, rust, grease, oil and the like shall be in accordance with SSPC-SP3 : Grade SA 2½ : near white metal finish.

Particular care shall be taken to prevent rusting and/or contamination of cleaned or primed surfaces. Cleaned surfaces shall be coated the same day as cleaning is done and before detrimental corrosion or recontamination occurs. All oil, grease and other contaminants shall be removed by solvent cleaning in accordance with either SSPC-SP1 or SANS 10064 (whichever is the more stringent) prior to any mechanical cleaning.

Abrasives for blast cleaning shall be clean and dry and shall be selected to provide a proper surface profile for the subsequent priming materials. All air pressure supply lines for blasting shall have effective and proper moisture and oil traps or filter devices.

Surface preparation may be subject to inspection by the Engineer before the prime coat is applied.

Abrasive and blasting sand shall be sampled and tested as directed by the Engineer. Samples shall also be kept for future reference purposes.

Where sandblasting is impossible and this is approved by the Engineer, the surface area can be cleaned with a combination of hand tools, including mechanical or wire brush.

(e) Painting Application

Paint shall be applied to dry, clean adequately prepared surfaces, under favorable conditions and in accordance with the paint manufacturer's instructions. Each coat of paint shall be properly cured before applying any additional coats of paint.

All containers shall remain closed until required for use. Paint shall be mechanically mixed before use, in accordance with the paint manufacturer's instructions. Agitation during application must be provided where specified by the paint manufacturer.

Paint must be applied by with a brush, rollers or spray equipment, in accordance with the paint manufacturer's instruction.

All coats shall be applied in a manner that will produce a film of uniform smoothness and thickness. Special attention shall be paid to crevices, weld lines, bolt heads, corners, edges and the like, to obtain the required thickness.

Painting shall only be done by skilled applicators. The criteria governing good workmanship shall be proper surface preparation, neat appearance, free of blisters, bubbles, craters, sags, runs, lap marks and unnecessary brush marks. Other criteria governing good workmanship shall be thorough mixing, straining, uniformity of film thickness, removal of dust, grease, zinc salts and other foreign matter, proper drying time between coats and protection of surfaces not to be painted.

The manufacturer's recommendations and instructions for thinning and handling his product form an integral part of this specification. Any conflict between the specifications and the manufacturer's recommendations shall be referred to the Engineer for resolution.

All coating dry film thicknesses shall be specified, except that:

- (1) In certain highly aggressive nominated areas the Engineer may instruct that a three coat paint system be used.
- (2) In certain acidic areas the Engineer may instruct a vinyl topcoat to be used in addition to the specified system.

Planned multiple coats of the same type, i.e. primer or finish, shall be applied in contrasting tints so that full coverage of the second coat can be easily gauged. This requirement also applies to striping. The final finish colour shall always be in accordance with the project colour standard.

Should the painting subcontractor chose to use rollers, the roller texture shall be such that there are no high points and the minimum dry film thickness is reached at the dimples.

The Contractor may be instructed to retain random samples of mixed and unmixed paint for further testing, as deemed necessary by the Engineer.

Where the configuration of steel piping permits this, the section embedded in concrete shall have the full specified coating applied to a distance of at least 75mm below the level of the finished concrete. Sections embedded in concrete that have not received the full coating shall be sealed at the base, using an approved poured bitumen mastic sealant. The base of the footings of any steel columns shall not be coated.

The coating subcontractor shall provide his crews with wet and dry film thickness gauges and issue instructions on the correct procedures for monitoring wet film thickness. The correlation between wet and dry film thicknesses shall be confirmed with the Engineer prior to the start of application of each system. Although this requirement is intended as an aid to obtain uniform film thicknesses, the final criteria shall be the attained dry film thickness, which shall remain the coating subcontractor's responsibility. Wet film thicknesses shall be taken immediately after paint application.

Irrespective of the paints specified, the Engineer reserves the right to change the specification for technical reasons.

Under no circumstances will a mixture of paint types be allowed.

(f) Inspection

Inspection shall take place at all stages of surface preparation and coating application, in accordance with an approved inspection schedule. Painting systems shall be checked for dry film thickness, surface finish and complete cure.

Surface preparation shall be inspected in accordance with SIS 05 59 00. All surfaces shall be made accessible for inspection.

Dry film thickness shall be measured with an approved electric induction type gauge, with due care being taken of its limitations with regard to the physical shape and condition of steelwork.

The dry film thickness shall not be taken before the coating has achieved its full drying and curing time, to a point that it can be handled or loaded, as determined by the paint manufacturer.

In the event of any dispute, the dry film thickness shall be measured using a micrometre screw gauge or a wedge cut instrument such as the Tooke gauge. Every attempt shall however be made to limit the requirement for such tests.

Adhesion testing may be carried out at the sole discretion of the Engineer. If deficiencies in adhesion are revealed in comparison to the reference panels supplied by the paint manufacturer, further tests shall be conducted to determine the extent of such deficiencies and the Contractor shall be liable for the cost of such tests. In the event of such disputes the paint manufacturer shall also be consulted.

The coating subcontractor shall be responsible for the repair of all minor damages arising from destructive testing.

(g) Remedial Work

Where coatings are found to be defective on completion, including surface defects resulting from adverse environments during curing and drying, the Engineer shall specify the further surface preparation and overcoating necessary to ensure conformity with the adopted standards.

Where defects are found, which are the result of inferior surface preparation or workmanship, irrespective of the areas involved, the Engineer may instruct the Contractor to completely remove the coating system to the extent that such defects are evident or expected. Surfaces shall be re-prepared and coated in accordance with the adopted standards.

In the case of early degradation of coatings by blistering, peeling, flaking, cracking or lack of adhesion, the above requirements will equally apply.

(h) Painting Materials

Painting materials shall be products of reputable manufacturers and of the type and colour as specified. All colours shall be factory mixed. The name, type and technical data sheets of all materials proposed by the Contractor shall be submitted to the Engineer for approval prior to placement of orders.

(i) Primers

Apply by air spray, brush or roller two coats of "Plascotuff 3000" or approved equivalent to a dry film thickness of 150 microns per coat. Colour shall be Light Grey

(ii) **Finishing Coats**

Apply by air spray, brush or roller "Plascothane 9000" or approved equivalent to a total dry film thickness of 60 microns. Colour shall be White.

PSS 3.4 EXTERNAL COATING OF LINE PIPE

(b) **General**

(i) **Scope**

This Particular Specification PSS3.4 covers the tape-wrap coating of new belowground pipelines, bends and risers. This external coating shall include the following materials:

- (1) Butyl primer.
- (2) Butyl mastic strip, where required .
- (3) Three-ply PE/Butyl rubber inner wrap, to be applied with 55% overlap.
- (4) Two-ply PE/Butyl rubber outer wrap, to be applied with 55% overlap.

(ii) **Labour, Plant and Materials**

The Contractor shall supply all materials, labour, plant, equipment and protective clothing necessary to field coat or wrap the completed works in accordance with this specification. The Contractor shall issue the necessary instructions to personnel applying protective coating systems to ensure that they are applied correctly and without any health hazards, in accordance with the guidelines provided by the manufacturer.

Alternative anti-corrosion systems or manufacturers may only be used with the prior written approval of the Engineer.

(iii) **Manufacturer's Instructions**

All coating and wrapping systems are to be applied strictly in accordance with the manufacturer's instructions. Particular care is to be given to adequate surface preparation to ensure that the field coating or wrapping overlaps any existing coating by no less than the minimum specified by the manufacturer.

(iv) **Engineer's Approval**

Pipework and fittings may only be coated/wrapped after the pipework has been approved by the

Engineer.

The Contractor shall submit his coating/wrapping specification and procedure for approval by the Engineer prior to commencement of wrapping activities.

Comprehensive technical data shall be supplied for any alternative coating system proposed by the Contractor for review and approval by the Engineer. The elasticity of such alternate coating systems shall be at least the same as the elasticity of the pipe material.

(iv) Surface Preparation

Existing coatings affected by welding or other damage are to be stripped back to a sound base. Thick existing coatings, such as coal tar enamel, are to be feathered to produce a smooth transition from the shop to the field coating system.

The area to be coated or wrapped must be thoroughly cleaned and dried. All millscale, weld slag, spatter, burned coatings, rust and other deleterious matter is to be removed by power wire brushing to SSPC-SP3 : Grade St.3.

All line pipe that is to receive tape wrapping as the final coating system shall be cleaned by wire brush to SSPC-SP2 : Grade St 2. The primer shall be applied no later than four hours after wire brush cleaning has been completed.

(c) Tape Wrap System

The tape wrapping shall comprise a cold-applied Denso double-wrap system, or approved equivalent. The system shall be applied in accordance with the manufacturer's recommendations and in compliance with SANS 1117 and SANS 10129. The specified system shall comprise of the following:

- (i) Surface preparation, as specified.
- (ii) Denso Butyl Primer, or approved equivalent, to be applied at a rate of 6m² per litre. The primer shall be allowed to tack dry prior to application of the tape.
- (iii) Profiling of irregular shapes (tee-pieces, reducers, flanges and the like) shall comprise of Denso Butyl Mastic, or approved equivalent.
- (iv) Inner Wrap, comprising of Denso S43 or approved equivalent, applied with a 55% overlap.
- (v) Outer Wrap, comprising of Denso R23 or approved equivalent, applied with a 55% overlap.

The tape wrap shall be applied by hand or by purpose-made equipment (Densoman), maintaining proper tension on the tape at all times to produce a finished surface that is free of any creases, wrinkles, air pockets and the like. The start and finish shall be tapered.

Any existing coating or preceding tape wrapping shall be overlapped by at least 150mm. Where one roll ends and a new roll is stated, an axial overlap of no less than 100mm shall be provided.

Underground irregular-shaped tees, branches and the like shall be protected using the approved wrapping system, in conjunction with a compatible moulding putty, as recommended by the manufacturer of the tape-wrap system. After the pipework has been cleaned and primed, the irregular shape shall be contoured using the moulding putty to produce a smooth surface, which can be tape-wrapped without any air voids or wrinkles.

Particular care shall be taken to ensure that a neat finish is achieved, providing complete protection of the pipework and fittings. Where a cigarette paper type wrapping method is used, longitudinal tape ends are to be held down by a finishing circumferential wrap.

(d) Heat Shrink Sleeves

The use of heat shrink sleeves shall not be permitted, unless special authorisations or instructions have been issued by the Engineer.

(e) Inspections

The Contractor shall compile and submit, for prior approval by the Engineer, comprehensive method statements, quality control procedures, pro-forma field reports and the like, covering the materials, methods, inspections, data sheets and tests undertaken with regard to the coating systems. These records shall be included in the hand-over data packs to be issued to the Engineer upon completion of the works.

Field inspections shall include 100% visual inspections and holiday detection, to be undertaken upon completion of the coating application, after it has properly cured, and immediately prior to lowering in of the completed pipe section in the trench. Wrapping systems are to be checked for workmanship and bonding between the tape and existing coatings. The Engineer may instruct additional tear tests, if deemed necessary. All holiday detection equipment shall be properly calibrated. Evidence of the calibration of equipment shall be provided to the Engineer upon request.

Holiday detection shall be undertaken in accordance with SANS 1217. A test voltage of between 50 and 80% of the breakdown voltage of the wrapping shall be used. The test voltage shall be 5000V + 5000V for each mm of wall thickness, with a maximum of 20 000V. All holiday detection tests must be witnessed by the Engineer.

The Contractor, in consultation with the coating system manufacturer, shall compile and submit for approval by the Engineer, a coating repair procedure, describing how any coating defects are to be attended to. This procedure shall be adopted for all coating repairs, which shall be re-tested by holiday

detection subsequent to completion of the repair.

Prior to lowering in and during backfilling operations the Contractor shall ensure that the pipe coating is not damaged and that the bedding and backfilling is free of sharp stones or rock, which may cause damage to the coating. The backfilling shall also be undertaken in a careful manner, to prevent any coating damages.

Steel slings or chains may not be used to lift and lower the pipe sections. Only nylon slings or belts, as approved by the Engineer, may be used for this purpose.

PSS 3.5 INTERNAL COATING OF LINE PIPE, OTHER PIPING AND FITTINGS

(a) Scope

All 4" or larger line pipe, piping and fittings for use with aviation fuels, to be installed as part of the works, shall be internally coated at the factory or pipe mill, using a Carboline 187 system, as described in this Particular Specification PSS 3.5. Flanges of any size are not to be lined with this system. The coating shall be applied in strict accordance with the manufacturer's specifications and data sheets.

Should the Contractor wish to propose an alternative system, acceptance of such a system will be subject to prior approval by the Engineer, to be provided at his sole discretion.

All coating procedures, surface preparation and application of the coating system shall be subject to inspection by the Engineer, including any inspectors appointed by the Engineer. No work shall be undertaken without the prior inspection and approval of the Engineer or his designated inspector.

(b) Surface Preparation

Prior to surface treatment, all pipes and fittings shall be inspected and, where necessary, pre-cleaned to remove all grease, soil dirt, salts and the like, which may adversely affect or impair blast cleaning or contaminate the abrasive medium used for blast cleaning. Steel defects that may cause damage or adversely affect the integrity of the coating shall be removed by grinding or filling.

The contact surface of flanges (raise face or flat face area) shall be protected from blasting damage by attaching properly sized metal or wooden rings to the contact face with double-sided tape, or by similar approved methods. The threaded area of any threaded fittings shall also be suitably taped prior to grit blasting. Such protection shall allow complete access to the remaining surfaces that require blast cleaning.

Blast cleaning shall be carried out in a shop separate from the area within which the paint is applied. The shop temperature shall be maintained above 10°C with a relative humidity below 80%. At the time of

cleaning the steel temperature shall be at least 5°C above dew point.

Before blasting commences, all pipes and fittings shall be checked for moisture and condensation. Moisture and condensation shall be removed by warming the pipe and fittings using an approved process, without any contamination of the steel surfaces. Further steps shall be taken to ensure that pipes and fittings remain dry whilst awaiting painting.

The internal surface of pipes and fittings shall be cleaned to BS EN ISO 8503. Blast cleaning shall also meet the pictorial standard indicated in SSPC-SP3 : Grade Sa 2.5 (Near-white blasting). The maximum amplitude of surface roughness shall be 110 microns.

The size and type of abrasive medium used shall be to BS EN ISO 8503 and shall be agreed with the paint manufacturer or supplier. The abrasive medium shall be free of fines, moisture and contamination, including chlorides. If re-used, the abrasive medium shall be sieved to remove dust and fine particles. Any abrasive medium considered to be unsatisfactory shall be removed and replaced.

All dust and abrasive medium shall be removed from the inside and outside of pipes and fittings by a combination of air blasting, brushing and finally by vacuuming. To prevent contamination of the clean surface, blasted pipe and fittings shall only be handled using clean cloths and equipment.

(c) Defects

Where these are accessible, all steel defects revealed by blast cleaning shall be removed by disc grinding and the area shall be re-blasted to the required standard. Very small defects may be removed by hand file, provided that affected area is less than 1cm².

The ground area shall be smoothly profiled with the pipe surface. Defect removal shall also not reduce the nominal wall thickness to less than 87.5% for seamless pipe and 92% for other, welded pipe types.

Where severe defects are found, which are inaccessible or reduce the wall thickness by more than the acceptable limits, the pipe length or section shall be quarantined and the matter referred to the pipe supplier and manufacturer. Pipes with severe defects shall be inspected using Magnetic Particle Inspection (MPI) or Ultrasonic Testing (UT) methods, to verify acceptance or rejection of the pipe length or section.

(d) Identifying Pipe and Fittings

Each pipe and fitting shall be given a unique serial number, to be marked on the pipe or fitting with an indelible marker or paint, after satisfactory shot/grit blasting and inspection

(e) Application

The internal coating and lining shall cover only the bore of the pipes and fittings. The weld bevels, flange contact faces and threads on fittings shall be suitably masked from painting.

No coating shall be done whenever the atmospheric temperature is below 10°C or when the surface temperature is below the dew point or when the relative humidity is above 85% or when airborne dust may be deposited on the paint surface.

Each batch of paint shall be mixed in accordance with the manufacturer's instructions, under the supervision of an inspector. Details of the mix shall be recorded. It must be possible to trace each paint batch number to a specific pipe or fitting.

Application of the coating shall commence within no more than 4 hours of completion of the blasting or a given pipe or fitting. Where this is exceeded, the pipe or fitting shall be re-blasted.

The mixed paint shall be applied to the inside of the clean, dry pipes and fittings by brush, roller or spray as soon as practicable. Two separate coats of the lining paint shall be applied, with the second coat being applied no sooner than 24 hours and no later than 72 hours after application of the first coat.

The coating shall be allowed to dry sufficiently before subsequent treatment, to avoid blistering or other damage to the coating.

The coating shall not be applied within 25mm of either end of pipes. The bare ends of the pipe must be protected from corrosion by means of a thin layer of oil or approved equivalent. Immediately prior to welding, the unlined interior pipe ends must be sanded to a visual near white metal finish, to remove all traces of oil, oxide or scale.

(f) Inspection and Testing

The paint shall be fully cured before the ends are sealed and before any external coating is applied. The finished paint film shall be tested for film thickness cure and adhesion, as described below.

Any pipe lining that does not meet the test criteria for cure and/or adhesion shall be re-blasted, relined and retested. Lining which is too thin may be built up, provided the full intercoat adhesion is achieved.

(i) Film Thickness and Finish

The two coats shall be applied. Each coat shall have a minimum dry film thickness of 110 microns. Dry film thickness measurements and frequency of readings shall be in accordance with SABS SM 141.

The lining shall be smooth, glossy and free of any runs, sags, curtaining and other defects, which may detract from the performance of the lining.

(ii) Ketone Test for Cure

The coating is to be rubbed for one minute with a clean, white rag, soaked in methyl ethyl ketone (MEK), after which time the lining must not be softened as indicated by scratching with a finger nail (slight indentation is permissible but no material removal shall occur) and the rag must show only very faint trace of the lining colour. The surface rubbed by the ketone rag should show no obvious sign of discoloration.

(iii) Test for Adhesion

The lining must be properly adhered to the internal pipe surface. The adhesion of each coat and each paint batch must be tested by carrying out either the Cross Cut test or the Grid Test on a test piece as described below.

- (1) Cross Cut Test : As shown in BS EN ISO 2409.
- (2) Grid Test : Using a sharp knife, cut a grid pattern of approximately 1mm squares. A strip of sticky tape (Sellotape or equivalent) is to be pressed down onto the grid pattern and ripped off. If squares of lining appear on the tape, adhesion is not adequate and the pipe has failed the test.

(iv) Adhesion Test Pieces

All adhesion tests shall be carried out on test pieces provided by the painting subcontractor. The test pieces shall have a minimum dimension of 100 x 50mm, made of 16 gauge mild steel. The test pieces shall be blasted to SA 2½ and coated at the same time as the pipe. The number of test pieces to be provided shall be the greater of the following:

- (1) At the start, middle and end of each shift, or
- (2) At the beginning and end of each paint mix.

Test pieces shall be assigned a traceable serial number so that they can be identified with the pipe number and paint batches. All test pieces shall be passed on to the Engineer.

At least 90% of all coating thickness measurements shall comply with the minimum requirements as specified above. 10% of all readings may be below the specified thickness, provided that the thickness is on no case less than 80% of the specified thickness. To determine the thickness of the second and any subsequent coats, it will be assumed that the previous layers have been applied exactly to the specified thickness.

Where the lining requirements do not comply with SANS 1217 remedial action shall be taken strictly in accordance with the manufacturer's or Engineer's instructions.

(g) Preparation for Dispatch

Fittings shall be packed so that the internal or external coating is not damaged in transit.

The ends of each lined pipe shall be firmly closed and sealed using a plastic end cap to prevent ingress of dirt, water and other foreign matter. For pipes that are to be coated externally, for underground use, the plastic end cap shall be of the recessed end type.

The Engineer may also request that sealing tape (Denso or equivalent) be taped over the cap to further protect the pipe from moisture.

(h) Inspection Records

The painting subcontractor shall progressively complete the inspection records during painting for review and sign off by the Engineer's designated inspector. On completion and acceptance of the lined pipe and fittings, a Release Certificate will be issued by the designated inspector. All inspection reports and records shall be completed and collated by the Contractor as part of the as-built records for the works.



AIRPORTS COMPANY SOUTH AFRICA

KING SHAKA INTERNATIONAL AIRPORT

TENDER NO: KSIA7806/2025/RFP

**PROCUREMENT OF A CIDB GRADE 9 CE CONTRACTOR THE COMPLETION OF BRAVO TAXIWAY
EXTENSION AT KING SHAKA INTERNATIONAL AIRPORT FOR A PERIOD OF 12 MONTHS**

C3.7: ACSA SPECIFICATIONS

The Specifications herein are Specifications prepared by the employer applicable to this contract. Three Specifications are included:

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Part C3: Scope of work		ACSA Specifications
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C3.7.1: OCCUPATIONAL HEALTH AND SAFETY SPECIFICATIONS

This part of the Specifications contains comprehensive occupational health and safety specifications.

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PART 1: ACSA OHS SPECIFICATIONS

1. INTRODUCTION

1.1 Purpose of the Occupational Health and Safety Specification

The purpose of the OHSS is to assist Contractors to achieve compliance with the Occupational Health and Safety law, in order to reduce incidents and injuries. The OHSS will be implemented during the construction of this project or any construction activity that the Employer has control over.

The OHSS is a performance specification to ensure that the Employer and any bodies that enter into formal agreements with the Employer viz. Agents, Consultants and Contractors achieve an acceptable level of OHS performance. No advice, approval of any document required by the OHSS such as hazard identification and risk assessment action plan or any other form of communication from the Employer shall be construed as an acceptance by the Employer of any obligation that absolves the Contractor from achieving the required level of performance and compliance with legal requirements. Further, there is no acceptance of liability by the Employer which may result from the Contractor failing to comply with the OHSS, i.e. the Contractor remains responsible for achieving the required performance levels.

1.2 Implementation of the Occupational Health and Safety Specification

This OHSS forms an integral part of the Contract, and Contractors are required to make it an integral part of their Contracts with Sub-Contractors and Suppliers. It will be disseminated by the Employer to persons responsible for and inspection of the design of the infrastructure works, who will ensure that it is included in the Tender Document(s) issued to prospective Contractors. The prospective Contractors shall incorporate the requirements of the OHSS in their submission of tenders to the Employer as well as provide health and safety plans for evaluation.

This specification must be read in conjunction with the OHS Act No 85 of 1993 (as amended), the Regulations as published in Government Gazette No 7721 of 18 July 2003 as well as the General Safety Regulations published in Government notice No. R 1031 of 30 May 1986, as amended.

The OHS Act Agreement in this document (Returnable Schedules) must be fully completed by the Contractor.

2. STANDARD OCCUPATIONAL HEALTH AND SAFETY SPECIFICATION

2.1 Scope

This OHSS covers the requirements for eliminating and mitigating incidents and injuries in all Employer controlled projects.

The scope also addresses legal compliance, hazard identification and risk control, promoting a health and safety culture amongst those working on ACSA projects and those affected by the activities taking place in and around them.

2.2 Interpretations

2.2.1 Application

The OHSS contains clauses that are applicable to building / construction and that impose pro-active controls associated with activities that impact on human health and safety as they relate to plant and machinery.

Compliance to the requirements of the OHSA, Construction Regulations and General Safety Regulations is in addition to the requirements of the OHSS and is part of the Contractor's responsibility. The Employer will through the Agents, as appointed, monitor that the Contractor complies with the requirements of the OHSA and will not prescribe to the Contractor how such compliance is achieved.

Definitions

The definitions used will be those set out in the Regulation Gazette No 7721 of 18 July 2003 with the following addition:

ACSA: Airports Company South Africa

Hazard Identification and Risk Assessment and Risk Control:

Means a documented plan, which identifies hazards, assesses the risks and details the control measures and safe working procedures which are to be used to mitigate and control the occurrence of hazards and risks during construction or operation phases.

Health and Safety Management Plan:

Means a documented plan which addresses the OHSS requirements hazards identified and include safe working procedures to mitigate, reduce or control the hazards identified.

Induction Training:

Means once off introductory training on general health and safety issues as well as project specific matters given to all employees before commencement of work or other visitors to the site.

Risk:

Means the probability or likelihood that a hazard can result in injury or damage.

Site:

Means the area in the possession of the Contractor for the construction of the works. Where there is no demarcated boundary it will include all adjacent areas, which are reasonably required for the activities for the Contractor, and approved for such use by the Engineer.

The Act:

Means, unless the context indicates otherwise, the Occupational Health and Safety Act, 1993 (Act NO. 85 of 1993) and Regulations promulgated there under.

Contractor:

The Contractor terminology used in these specifications shall be deemed to cover Principle Contractor, Contractors and Sub-Contractors.

3. REQUIREMENTS AT TENDER STAGE

The Contractor shall make available the following with his completed tender:

A Health and Safety Plan as described in Regulation 7 of the Construction Regulations. The Safety Plan must be based on the Construction Regulations 2014 and this specification and will be subject to approval by the Employer. This will include a Hazard Identification and Risk Assessment appropriate to the project, expansion of Annexure D, and a declaration to the effect that he has the competence, completion of Occupational Health and Safety Questionnaire, and necessary resources to carry out the work safely in compliance with the Construction Regulations 2014.

Failure to submit the foregoing with his tender, will lead to the conclusion that the Contractor is not able to carry out the work under the contract safely in accordance with the Construction Regulations and may result in the tender being disqualified.

4. NOTIFICATION OF COMMENCEMENT OF CONSTRUCTION WORK

Due to the estimated project cost the Clients Health and Safety Agent will apply for a construction works permit. No construction or related work such as site establishment or delivery of any equipment or material may commence before the construction works permit has been received and the Engineer approved the start of the works.

The Contractor will have **14 days** after the Acceptance of Tender, to submit the required Documentation for the Department of Labour. This includes:

- Safety Plan with Baseline Risk Assessment
- Approved SHEQ BOQ- (priced)
- Signed mandatory agreement (Sec 37,2 & 5.1(k))
- Site organogram
- Valid proof of letter of good standing
- Profile of appointed Construction Manager in terms of CR 8(1)
- Profile of appointed Health and safety Officer in terms of CR 8(5)
- Profile of appointed Health and Safety Manager in terms of CR 8

A copy of the construction works permit must be conspicuously displayed at the main entrance to the site as well as be kept on the health and safety files, and be available for inspection by inspectors, Employer, Engineer, employees and other duly authorised persons on site.

5. GUIDELINES FOR THE DEVELOPMENT OF A HEALTH & SAFETY PLAN

5.1 Background

In terms of the Construction Regulations [Regulation 5 (1) (b)] of the Occupational Health and Safety Act, No 85 of 1993, the Client is required to compile an Occupational Health and Safety specification for each of its projects and the Contractor, appointed by the Client in terms of Regulation 5 (1) (k), is required to prepare an Occupational Health and Safety Plan. This plan has to be prepared in terms of Regulation 7 (1)(a) as well as the Client's Occupational Health & Safety Specification. In terms of Regulation 5 (1)(l), the Client and the Contractor are required to agree on the Occupational Health and Safety Plan before any work may commence.

5.2 Framework for an Occupational Health and Safety Plan

5.2.1 Introduction

The Contractor has to demonstrate to the Client that he has a suitable and sufficiently documented Occupational Health and Safety Plan as well as the necessary competencies, experience and resources to perform the construction work safely. The Contractor is required to submit, the following documentation for perusal and verification by the Client:

- Management Structure including an organogram – Tender Stage
- Quality Plan – Tender Stage
- Human Resources Plan – Tender Stage
- Registered Workplace Skills Plan
- “Letter of good standing” from the Compensation Commissioner or licensed compensation insurer – Tender Stage
- Proof of induction and other training of employees
- Example copies of minutes of previous Occupational Health and Safety Committee meetings and copies of Incident Investigation Reports

5.2.2 Contents of an Occupational Health and Safety Plan

The Occupational Health and Safety Plan shall include the following:

5.2.2.1 Occupational Health and Safety Management Programme

- Management of Occupational Health and Safety risks
- Occupational Health and Safety structures and appointments
- Programme of Occupational Health and Safety inspections
- Occupational Health and Safety Representatives
- Occupational Health and Safety committee

5.2.2.2 Statement Regarding the Communication and Management of the Work

- Management structure and responsibilities
- Occupational Health and Safety objectives for the project and arrangements for monitoring and review of Occupational Health and Safety performance
- Arrangements for regular liaison between parties on site
- Consultation with the workforce
- The exchange of design information between the Client, Engineer, supervisors and subcontractors on site
- Handling design changes during the project
- Selection and control of subcontractors
- The exchange of Occupational Health and Safety information between all subcontractors
- Security
- Site induction and onsite training
- Facilities and first-aid
- The reporting and investigation of accidents and incidents
- The production and approval of risk assessments and method statements
- Site Occupational Health and Safety rules
- Fire and emergency procedures
- Reporting to the Client i.e. results of Occupational Health and Safety inspections.
- Incident investigations and committee meetings
- Reporting of incidents to the Department of Labour and Compensation Commissioner where appropriate

6. APPOINTMENT OF SAFETY PERSONNEL

6.1 Construction Supervisor

In terms of Section 16 of the Act, the Chief Executive Officer of the Contractor may delegate, in writing, part or all of his powers to a suitable person on the site.

The Contractor shall appoint a full-time Construction Manager, in writing, in terms of Section 8.(1) of the Construction Regulations with the duty of supervising the performance of the construction work as well as ensuring occupational health and safety compliance.

He may also have to appoint one or more competent employees to assist the construction manager where justified by the scope and complexity of the works as well as an Alternate Construction Manager when applicable.

6.2 Construction safety officer

In terms of Section 8(5) of the Construction Regulations the Contractor shall appoint in writing a full-time Construction Safety Officer which is duly accredited by SACPCMP. The Safety Officer shall have the necessary competence and resources to perform his duties diligently.

Provision will be made in the Bill of Quantities to cover the cost of a dedicated construction safety officer appointed after award of the contract.

6.3 Health and safety representatives

In terms of Sections 17 and 18 of the Act (OHSA 1993) the Contractor shall appoint, in writing, a health and safety representative whenever he has more than 20 employees in his employ on the works. The health and safety representative must be selected from employees who are employed in a full-time capacity at a specific workplace.

The number of health and safety representatives for a workplace shall be at least one for every 50 employees which will include the employees of subcontractors

The function of the health and safety representative(s) will be to review the effectiveness of health and safety measures, to identify potential hazards and major incidents, to examine causes of incidents (in collaboration with his employer, the Contractor), to investigate complaints by employees relating to health and safety at work, to make representations to the employer (Contractor) or inspector on general matters affecting the health and safety of employees, to inspect the workplace, plant, machinery etc. on a regular base, but at least on a weekly basis to participate in consultations with inspectors and to attend meetings of the health and safety committee.

6.4 Health and safety committee

In terms of Sections 17,18 and 19 of the Act (OHSA 1993) the Contractor (as employer), shall establish one or more health and safety committee(s) where there are two or more health and safety representatives at a workplace. The persons selected by the employees and appointed by the Contractor to serve on the committee shall be designated in writing.

The function of the health and safety committee shall be to hold meetings at regular intervals, but at least once every three months, to review the health and safety measures on the contract, to discuss incidents related to health and safety with the Contractor's representative and any Department of Labour inspector, and to make recommendations regarding health and safety to the Contractor and to keep record of meetings, recommendations and reports made by the committee.

6.5 Competent persons

In accordance with the Construction Regulations the Contractor shall appoint, in writing, competent persons responsible for supervising construction work for the following work situations that may be expected on the site of the works, as applicable to the project.

- Risk assessment (Regulation 9);
- Fall protection (Regulation 10);
- Excavation work (Regulation 13);
- Demolition work (Regulation 14);
- Suspended platform operations (Regulation 17);
- Material Hoists (Regulation 19);
- Bulk mixing plant operations (Regulation 208);
- Explosive actuated fastening device (Regulation 21)
- Construction vehicle and mobile plant (Regulation 23);
- Use of temporary storage of flammable liquids on construction site (Regulation 25);
- Water environments (Regulation 26);
- Housekeeping on construction sites (Regulation 27)
- Stacking and storage on construction sites (Regulation 28);
- Fire precautions on construction sites (Regulation 29); and
- Construction employees' facilities (Regulation 308).

A competent person may be appointed for more than one part of the construction work with the understanding that the person must be suitably qualified and able to supervise at the same time the construction work on all the work situations for which he has been appointed.

The appointment of competent persons to supervise parts of the construction work does not relieve the Contractor from any of his responsibilities to comply with all requirements of the Construction Regulations.

7. PROJECT / SITE SPECIFIC REQUIREMENTS

A list of activities and considerations that have been identified for the project and the construction site and for which Risk Assessments, Standard Working Procedures (SWP), management and control measures and Method Statements (where necessary) have to be developed by the Principal Contractor is given in Annexure D. This list is not to be considered as inclusive and other items must be added as required.

In addition, the following health risks should be taken into account. It may become necessary to include others according to the requirements of the project.

Health risks

- Health risks arising from neighbouring as well as own activities and from the environment e.g. threats by dogs, bees, snakes, inclement weather etc.
- Exposure to noise
- Exposure to vibration
- Protection against dehydration and heat exhaustion
- Protection from wet & cold conditions
- Exposure to hazardous substances and chemicals used on site.

Emergency Procedures

The Principal Contractor shall submit a detailed Emergency Procedure for approval by the Client prior to commencement on site. The procedure shall detail the response plan including the following key elements:

- List of key competent personnel
- Details of emergency services
- Actions or steps to be taken in the event of the specific types of emergencies
- Information on hazardous material/situations.

Emergency procedure(s) shall include, but shall not be limited to, fire, spills, accidents to employees, use of hazardous substances, bomb threats, major incidents/accidents, etc. The Principal Contractor shall advise the Client, Agent, Engineer and all relevant authorities forthwith, of any emergencies, together with a record of action taken. This shall be confirmed in writing as soon as possible after the incident. A contact list of all service providers

(Fire Department, Ambulance, Police, Medical and Hospital, Construction Manager, Safety Officer etc) must be maintained and available to site personnel. These procedures shall form part of the Health and Safety Plan.

First Aid Boxes and First Aid Equipment

The Principal Contractor and all Contractors shall appoint in writing First Aider(s). If not already accredited, the appointed First Aider(s) are to be sent for accredited first aid training. Valid certificates are to be kept on site. The Principal Contractor shall provide an on-site First Aid Station with first aid facilities, including first aid boxes containing, at least, the requirements of the Annexure to Section 3 of the General Safety Regulations. All Contractors with 5 or more employees shall supply their own first aid box. Contractors with 10 or more employees shall have a trained and certified First Aider on site at all times.

Personal Protective Equipment (PPE) and Clothing

The Principal Contractor shall ensure that all employees are issued with and shall wear hard hats, protective footwear and overalls as well as any other necessary PPE as set out in Section 2.3 of the General Safety Regulations. Contractors are encouraged to provide reflective vests for all their employees. The Principal Contractor and all Contractors shall make provision and keep adequate quantities of SABS approved PPE on site at all times. This shall include necessary safety gear for visitors. The Principal Contractor shall clearly outline procedures to be taken when PPE or Clothing is:

- Lost or stolen
- Worn out or damaged
- Issued to temporary employees.

The above procedure applies to Contractors and their Sub-contractors, as they are all Employers in their own right.

Occupational Health and Safety Signage

The Contractor shall provide adequate on-site OHS signage. This should include but is not limited to: 'no unauthorised entry', 'report to site office', 'site office', 'beware of overhead work', 'hard hat area'. Signage shall be posted up at all entrances to site as well as on site in strategic locations e.g. access routes, stairways, entrances to structures and buildings, and other potential risk areas/operations. These signs shall be in accordance with the requirements of the General Safety Regulations as amended.

8. HEALTH AND SAFETY FILE

The Contractor shall in terms of Construction Regulation 7(1)(b) maintain a Health and Safety File on site at all times. The Health and Safety File is a file or other permanent record containing information on aspects of the construction project - which will be necessary to ensure the health and safety of any person who may be affected by the construction work.

The Contractor shall appoint a suitably qualified person to prepare the Health and Safety File and to keep it up to date for the duration of the contract. The Health and Safety file shall include at least the following information:

- All Documents as required by the Act and Regulations
- All reports of inspections and audits
- All non-conformity reports
- All working drawings, calculations and design where applicable
- Detailed list of sub-contractors with contact details
- List of all hazardous materials used and stored on site with Material Safety Data Sheets
- All Hazard Identification and Risk Assessments carried out for the project.
- All Health and Safety Plans for the project.
- All safe working procedures and method statements
- Minutes of all relevant meetings
- Incident records, including investigations and results
- Record of all appointments under the Regulations

Annexure B is a list of the records to be kept on site.

The Health & Safety File shall be handed over to the Client on completion of the contract. It must contain all the documentation as set out above, or as instructed, as well as any handed to the Principle Contractor by any subcontractors together with a record of all drawings, designs, materials used and other similar information concerning the completed project.

9. RISK ASSESSMENT

Before commencement of any construction work during the construction period, the Contractor shall have a risk assessment performed and recorded in writing by a competent person. (Refer Regulation 9 of the Construction Regulations 2014).

Risk is a measure of the likelihood that the harm from a particular hazard will be realised, taking into account the possible severity of the harm. Harm to people includes death, injury (permanent or temporary), physical or mental health or any combination thereof. Risk management in health and safety includes the identification of hazards, assessing risks, taking action to eliminate or reduce the risk, monitoring the effectiveness and performing regular reviews of the entire process. The Contractor shall compile method statements to address or handle the following:

- Hazards particulars to the contract
- Identify what could go wrong and how
- Identify the likelihood of this happening
- Identify the persons or asset at risk
- Identify the extent of possible harm
- Eliminating or reducing this risk
- A monitoring plan
- A review plan

Contractors must ensure that all subcontractors conduct risk assessments for their scope of work as well. All risk assessments shall be updated and re-evaluated with any extra works or with any change to the scope of the works.

The risk assessment shall identify and evaluate the risks and hazards that may be expected during the execution of the work under the contract, and it shall include a documented plan of safe work procedures to mitigate, reduce or control the risks and hazards identified.

The risk assessment shall be available on site for inspection by inspectors, Employer, Engineer, Health and Safety Agent, subcontractors, employees, trade unions and health and safety committee members, and must be monitored and reviewed periodically by the Contractor.

10. ARRANGEMENTS FOR MONITORING AND REVIEW

The Client and/or Agent will conduct a Monthly, or at greater frequency, Audit to audit compliance with Construction Regulation 5 (1) (o) to ensure that the Contractor has implemented and is maintaining the agreed and approved OH&S Plan. Annexure C will be used as format when conducting the audit.

The Client reserves the right to conduct other ad hoc audits and inspections as deemed necessary.

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

11. MEASUREMENT AND PAYMENT

In tendering rates for these items the Contractor shall ensure that the sum of the amounts of the four items shall be based upon as well as be expressed as a percentage (i.e. 1%) of the Work Value of the Tender (Total: Schedule A).

"Item Description	Unit
C1.2.5.1 Health and safety plan.....	Lump Sum

The full amount will be paid in one instalment only once:-

- (a) The construction works permit has been issued by the Department of Labour .
- (b) The Contractor has made the required initial Appointments of Employees and Sub-Contractors.
- (c) The Client has approved the Contractor's Health and Safety Plan.
- (d) The Contractor has set up his Health and Safety File."

"Item

Unit

C1.2.5.2 Implementation of health and safety plan.....Month

The tendered rate shall represent full compensation for that part of the contractors general obligations in terms of the Occupational Health and Safety Act and the Construction Regulations which are mainly a function of time. The sum will be paid per month only after payment for Item C1.2.5.1 has been made. This item shall also cover all updates of the files, plans and reports associated with the Occupational Health and Safety Act and the Construction Regulations."

Add the following pay items:

C1.2.5.3 Provision of full time Construction Safety Officer.....Month

The tendered sum shall include for the cost of a SACPCMP accredited construction safety officer on a full time basis, his overheads, transport and all others items necessary for the proper carrying out of his duties. ."

PART 2: PROJECT SPECIFIC HEALTH AND SAFETY SPECIFICATIONS

Occupational Health and Safety Specification

In terms of Construction Regulations 2014

Client

ACSA

Description of Project Works

PROCUREMENT OF A CIDB GRADE 9 CE CONTRACTOR THE COMPLETION OF BRAVO TAXIWAY EXTENSION AT KING SHAKA INTERNATIONAL AIRPORT FOR A PERIOD OF 12 MONTHS

Project Location

KING SHAKA INTERNATIONAL AIRPORT

Refer To Annexures A1 and A2 For Project Specific Health And Safety Specification.

C3.7.2: ENVIRONMENTAL WORK INSTRUCTIONS

THE ACSA ENVIRONMENTAL SPECIFICATION

It is a requirement of the Airports Company South Africa (ACSA) - that all construction works within ACSA airports be undertaken in accordance with the ACSA Environmental Specification

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SECTION 2: ACSA ENVIRONMENTAL PARTICULAR SPECIFICATIONS

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EP2	Organisational Requirements
EP3	Method Statements
EP4	General Site Procedures
EP5	Site Clearance
EP6	Site Rehabilitation
EP7	Management and Monitoring

LIST OF ABBREVIATIONS

ACSA	Airports Company South Africa
AEC	Airport Environmental Committee
EO	Environmental Officer
ES	Environmental Specification
EMS	Environmental Management System for ACSA
ESA	Environmentally Sensitive Areas
SABS	South African Bureau of Standards
SAHRA	South African Heritage Resource Agency
SSSI	Sites of Special Scientific Interest

PART 1: ACSA ENVIRONMENTAL SPECIFICATIONS OVERVIEW

1. PURPOSE OF THE ENVIRONMENTAL SPECIFICATIONS

The purpose of the Environmental Specifications (ES) is to translate the recommendations of the Environmental Management System (EMS) into a contractual environmental specification for application during construction activities.

The Environmental Specifications will be applicable to all construction activities that occur on ACSA owned and/or managed airports. Construction activities include construction of buildings, infrastructure as well as developer / tenant property and rehabilitation works at the airport.

2. IMPLEMENTATION OF THE ENVIRONMENTAL SPECIFICATIONS

The Environmental Specifications is intended for dissemination by ACSA to the “Employer”, who is the party for whom the construction works are to be executed (hereafter referred to as the Employer). The Employer may therefore be ACSA (the relevant Departmental Manager responsible for construction activities), a tenant or a developer with a land lease or another party such as a contractor responsible for developing or rehabilitation of the site or sites at the airport.

The Employer shall ensure that the Environmental Specification is included in the Tender Document(s) issued to the prospective Contractor and is also responsible for appointing/designating, in writing, a Responsible Person for the construction works.

The Responsible Person would manage the requirements outlined in the Environmental Specifications on behalf of the Employer. The Contractors shall incorporate the requirements of the ES in their tender submissions to the Employer and are responsible for implementing the ES on a daily basis.

The Environmental Officer (EO) will be responsible for updating the ES as required, auditing the implementation of the ES for each construction project and for maintaining the document control and record systems associated with it.

The Environmental Specifications report has been structured to be incorporated into a standard engineering tender document as the Environmental Particular Specification.

A ‘Particular Specification’ is the terminology used for a specification that covers activities that are not adequately covered in the standardised SABS 1200 series specifications for engineering contracts, or where the specification is sufficiently detailed to make it inappropriate for inclusion as a variation or addition to a standardised specification.

The Environmental Specification is a generic document applicable to construction projects at all ACSA airports. The majority of the specifications within the ES will apply to all construction work, although it is anticipated that variations to this specification may need to be included for some specific developments. Variations would be made by the Environmental Officer, prior to the issue of the ES to the Employer.

PART 2: ENVIRONMENTAL PARTICULAR SPECIFICATIONS

Index to Environmental Particular (EP) Specifications

Clause	Description
EP1	INTRODUCTION
EP2	ORGANISATIONAL REQUIREMENTS
EP2.1	Organisational overview and structure
EP2.2	Roles and responsibilities
EP3	METHOD STATEMENTS
EP4	GENERAL SITE PROCEDURES
EP4.1	Demarcation of Environmentally Sensitive Areas (ESAs)
EP4.2	Location of camp and depot
EP4.3	Demarcation of the site
EP4.4	Ablution Facilities
EP4.5	Domestic waste water
EP4.6	Refuse
EP4.7	Protection of the fauna and flora
EP4.8	Defacement of natural features
EP4.9	Protection of archaeological and paleontological sites
EP4.10	Effluent and storm-water management
EP4.11	Dust control
EP4.12	Noise control
EP4.13	Materials use, handling, storage and transport
EP4.14	Emergency procedures
EP4.15	Social issues
EP5	SITE CLEARANCE
EP5.1	Removal of top soil
EP5.2	Stabilisation of steep slopes
EP5.3	Removal of alien vegetation
EP6	SITE REHABILITATION
EP6.1	Scope
EP6.2	Landscaping and preparation for re-vegetation
EP7	MANAGEMENT AND MONITORING:
EP7.1	Monitoring and reporting
EP7.2	Environmental awareness training
EP7.3	Non-conformance and corrective actions
EP7.4	Documentation
EP7.5	Incentives and penalties
EP7.6	External audit

EP1 INTRODUCTION

The ES has been prepared and is to be implemented as part of the Environmental Management Systems for ACSA.

The ES provides specifications that the Contractor shall adhere to, in order to minimise adverse environmental impacts and optimise opportunities associated with construction activities.

The ES is provided to the Contractor at the tender stage so that the costs of implementing the ES are included into the contract cost and so that the Contractor is aware of his environmental responsibilities before commencing work.

The aim of this ES is to ensure that environmental management of site activities is integrated into the other management systems implemented by the Contractor (e.g. quality management, health and safety). For this reason, the ES includes a requirement for the Contractor(s) to develop their own system (i.e. roles, responsibilities and timing) for ensuring that the requirements of the ES are met, and that the Contractor checks, by means of an internal audit, that this system is operating effectively.

EP2 ORGANISATIONAL REQUIREMENTS

EP2.1 Organisational Structure

This section outlines the required management structure for the administration of the ES, with particular emphasis on the roles and responsibilities of key individuals.

The organisational structure for the implementation of the ES is presented in Figure 1 and should be viewed in conjunction with the roles and responsibilities below.

EP2.2 Roles and responsibilities

EP2.2.1 Airports Company South Africa

Airports Company South Africa is ultimately responsible for ensuring effective environmental management at the airport in terms of the scope of the Environmental Management Systems.

EP2.2.2 Environmental Officer (EO)

The Environmental Officer has been appointed by ACSA, and is responsible for monitoring the implementation of the requirements of the Environmental Specification by the relevant parties as specified.

The Environmental Officer shall:

- Review and approve in writing valid method statements;
- Inspect the Contractor's site to check compliance with method statements and the requirements of the ES (at least weekly and more frequently if thought to be warranted by the EO) and maintain inspection reports on file;
- Meet with the Responsible Person for the developer or tenant, whereby the Responsible Person reports on the implementation of the ES (at least monthly) and keep a record of minutes of the above meetings;
- Provide material / manuals and assistance to the Responsible Person for the initial environmental training sessions; and
- Report in writing any problems related to conformance with the ES which cannot be resolved in co-operation with the relevant Responsible Person to ACSA Managers or the relevant developer / tenant.

EP2.2.3 Employer

The Employer shall:

- Include the ES, with any revisions, in any tender document related to construction activities on site;
- Designate in writing a Responsible Person for the proper implementation of the ES; and

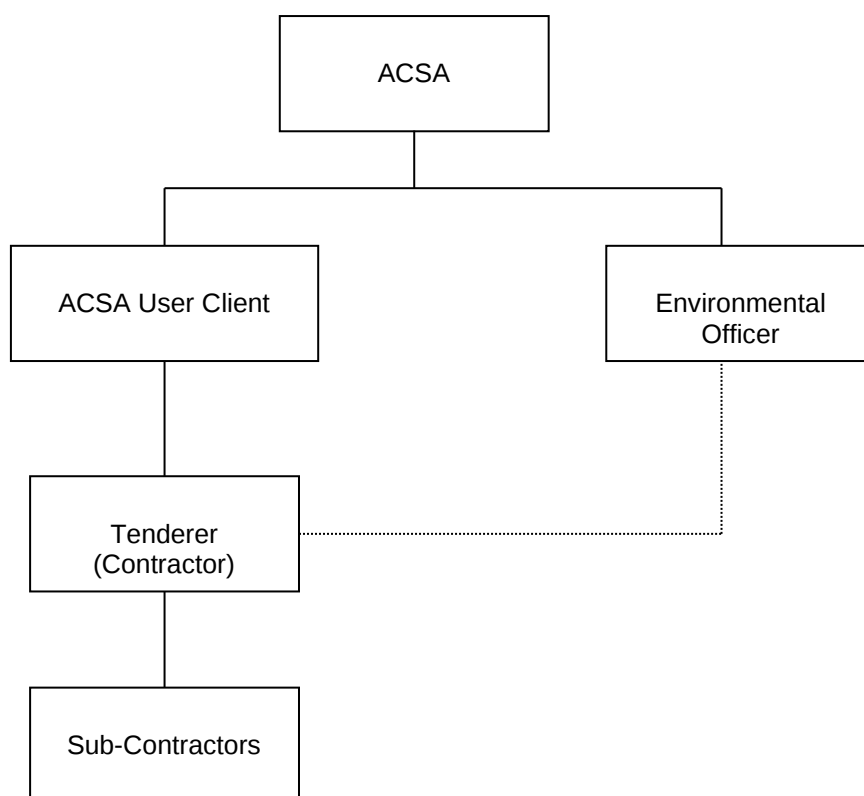
- Send a copy of the letter of appointment of the Responsible Person to the EO.

EP2.2.4 Responsible Person

The Responsible Person for each building site or infrastructure installation shall:

- Develop a system to ensure that the ES is effectively implemented;
- Audit this system so that he/she can demonstrate to the EO that the ES is being effectively implemented;
- Ensure that Contractors staff, sub-contractors, suppliers etc. receive appropriate environmental awareness training prior to commencement of work on the project and maintain records of training. It is anticipated, though not a requirement, that the Responsible Person will deliver training sessions;
- Ensure that responsible persons for sub-contractors are designated to carry out the requirements of the Environmental Specifications
- Submit method statements to the Environmental Officer for approval as specified in the Environmental Specifications and maintain approved method statements on file; and
- Have sufficient authority to issue site instructions to the Contractors staff on their site. It is probable, though not a requirement, that the Responsible Person will be the Engineers Representative.

Figure 1: Organisational structure showing lines of responsibility and communication during the construction phase at the airport.



EP3 METHOD STATEMENTS

The Contractor shall submit a written method statement to the Responsible Person for approval, covering those activities which are identified (in this document and/or by the Environmental Officer), as being potentially harmful to the environment.

Method statements indicate how compliance with the Environmental Particular Specification will be achieved.

The method statement shall state clearly:

- timing of activities;
- materials to be used;
- equipment and staffing requirements;
- the proposed construction procedure designed to implement the relevant environmental specifications;
- the system to be implemented to ensure compliance with the above; and
- other information deemed necessary by the Environmental Officer and Responsible Person.

The method statement shall be submitted at least five working days prior to expected commencement of work on an activity, to allow the Responsible Person time to study and approve the method statement. The contractor shall ensure ACSA that the activity is conducted according to the method statement which will be approved in writing by the ACSA successful tenderer (and also signed by the ACSA Environmental Officer), which shall be done within five working days of receipt.

Due to changing circumstances, it may be necessary to modify method statements. In such cases, the proposed modifications must be indicated and agreed upon in writing between the Environmental Officer and Responsible Person. The EO and Responsible Person must retain records of any amendments and ensure that the most current version of any method statement is being used.

EP4 GENERAL SITE PROCEDURES

EP4.1 Demarcation of Environmentally Sensitive Areas

Before construction commences there needs to be confirmation by ACSA's Environmental Officer that the vegetation in the area to be impacted by construction activities is not identified as an Environmentally Sensitive Area (ESA). However, should Environmental Sensitive Areas be identified during the construction period the following actions would have to be taken to minimize adverse impacts:

- Environmentally Sensitive Areas, shall not be entered or used for any purpose unless a written motivation has been submitted to the EO by the Responsible Person, and written approval has been obtained from the EO;
- The Contractor shall exercise special care when working close to the ESA's in order to avoid damage or physical disturbance of these areas. The EO may instruct the Responsible Person to restrict the number of construction personnel and equipment operating near Environmentally Sensitive Areas (ESA's);
- Damage caused to ESAs by the Contractor shall be cause for the Contractor to make good any damaged areas to the written satisfaction of the EO;
- The Contractor shall note the proximity to the site of any designated ESAs. The Contractor shall fence any ESAs located within 20-m of the site boundary. The fencing shall extend along the boundary of the ESA for sufficient distance to ensure that the location of the ESA is obvious from the Contractor's site and from the approach to the Contractor's Site; and
- The Contractor shall make provision for the demarcation of ESAs with fencing to the following specifications:

Posts shall be wooden droppers or steel standards where the ground is too hard for wooden droppers to be driven in;

- The posts shall be long enough and spaced closely enough to support a strand of 12-gauge wire at 750- mm above the ground level; and
- The top 300-mm of the posts shall be painted white for easy visibility.

EP4.2 Location of camp and depot

The Contractor's Camp and Materials Storage Area shall be located at a position approved by the Responsible Person. No site staff other than security personnel shall be housed on site.

The Contractor shall provide water and/or washing facilities at the Contractor's Camp for personnel.

The Contractor's Camp and Materials Storage Area shall be kept neat and tidy and free of litter.

EP4.3 Demarcation of the site

It is important that activities are conducted within a limited area to facilitate control and to minimise the impact on the existing natural environment, existing tenants and other construction activities in the vicinity and public thoroughfares.

The Contractor shall demarcate the boundaries of the site in order to restrict his construction activities to the site. The method of demarcation and the location of the demarcated area shall be determined by the Contractor and approved by the Responsible Person before any work being undertaken. The Contractor shall ensure that all plant, labour and materials remain within the boundaries of the site. Failure to do so may result in the Contractor being required to fence the boundaries of the site at his/her own expense to the satisfaction of the Responsible Person.

If additional areas (e.g. for lay down, rest areas) are required, these must be approved in writing by the Responsible Person. The Contractor is advised that it may take approximately one week to obtain such permission from the Responsible Person.

Suitable temporary fencing may need to be erected during construction to minimise the risk of injury to the public, and animals.

EP4.4 Ablution Facilities

The Contractor shall provide the necessary ablution facilities for all his personnel.

Toilets with chemical disinfectants shall be provided, with a minimum of one toilet per 15-persons. Toilets shall be easily accessible and shall be transportable. The toilets shall be secured to prevent them from blowing over, and shall be provided with an external closing mechanism to prevent toilet paper from being blown out. Toilet paper dispensers shall be provided in all toilets. Toilets shall be cleaned and serviced regularly by a reputable toilet servicing company. Toilets shall be emptied before long weekends and builders' holidays.

The Contractor shall ensure that chemicals and/or waste from toilet cleaning operations are not spilled on the ground at any time. Should there be repeated spillage of chemicals and/or waste (i.e. more than three incidents), the EO shall require the Contractor to place the toilets on a solid base with a sump at his own expense. Accumulations of chemicals and waste will have to be removed from the site and disposed at an approved waste disposal site or sewage plant.

Abluting anywhere other than in the toilets shall not be permitted. Repeated use of open areas, rivers or other areas for ablution purposes (i.e. more than three incidents) may result in the guilty party being given a spot fine. The Contractor shall also be responsible for cleaning up any waste deposited by his personnel.

EP4.5 Domestic waste water

Waste-water from any other ablution or kitchen facilities on site shall be discharged into a suitable conservancy tank. The Contractor shall be responsible for ensuring that the system continues to operate effectively throughout the project and that the conservancy tank is emptied as required during the project. The Contractor shall employ a suitable qualified sub-contractor or the local authority to empty the conservancy tank.

EP4.6 Refuse

Refuse refers to all solid waste, including construction debris (e.g. wrapping materials, timber, cans etc.) waste and surplus food, food packaging etc.

The Contractor shall institute an on-site waste management system that is acceptable to the Responsible Person in order to prevent the spread of refuse within and beyond the site. The Contractor is reminded that wind velocities on the construction site can be extremely high.

All waste shall be collected and contained immediately. The Contractor shall institute a weekly clean-up of the site if so instructed by the Responsible Person. This daily/weekly clean up shall be for the Contractor's account.

The Contractor shall not dispose of any waste and/or construction debris by burning or burying. The use of waste bins and skips is recommended. The bins shall be provided with lids and an external closing mechanism to prevent their contents from blowing out. The Contractor shall ensure that all waste is deposited by his employees in the waste bins for removal by the Contractor. Bins shall not be used for any purposes other than waste collection and shall be emptied on a regular basis. All waste shall be disposed of off-site at approved landfill sites.

Waste generated at the construction camps shall be separated into recyclable and non-recyclable waste, and shall be separated as follows:

- Hazardous waste (including used oil, diesel, petrol tins, paint, bitumen, etc.);
- Recyclable waste (paper, tins, glass);
- General waste; and
- Reusable construction material

Recyclable waste shall be deposited in separate skips/bins and removed off-site for recycling. The Contractor may wish to enter into an agreement with the surrounding communities and/or his staff with regard to the collection and sale of recyclable and reusable materials.

Hazardous waste, including waste oil and other chemicals (e.g. paints, solvents) shall be stored in (an) enclosed area(s), and shall be clearly marked. If deemed necessary by the Responsible Person, the Contractor shall obtain the advice of a specialist waste expert concerning the storage of hazardous waste. Such waste shall be disposed of off-site by a specialist waste contractor, at a permitted hazardous waste disposal site.

The EO shall be consulted about, and agree to, the method of storage and disposal of hazardous waste.

The Contractor is advised that spot fines for littering have been included in this document. Offenders found littering will be liable for a spot fine.

EP4.7 Protection of fauna and flora

All fauna within and around the site shall be protected. Birds and animals shall not be caught or killed by any means, including poisoning, trapping, shooting or setting of snares. Offenders may be prosecuted in terms of the Animals Protection Act 71 of 1962.

EP4.8 Defacement of natural features

Defacement of any features outside of the construction site shall not occur without the prior written permission of the Responsible Person. Any features defaced by the Contractor shall be restored to the satisfaction of the Responsible Person.

EP4.9 Protection of archaeological and palaeontological Sites

If any possible palaeontological /archaeological material is found during excavations, the Contractor shall stop work immediately and inform the Responsible Person. The Responsible person will inform the South African Heritage Resource Agency (SAHRA) and arrange for a palaeontologist/archaeologist to inspect, and if necessary

excavate, the material, subject to acquiring the requisite permits from the National Monuments Council. Costs incurred will be for the Employer's account.

EP4.10 Effluent and storm-water management

EP4.10.1 General

The Contractor must ensure that pollution of the ground or surface water does not occur as a result of site activities. Pollution could result from the accidental release of contaminated run-off from construction camps, discharge of contaminated construction water, chemicals, oils, fuels, sewage, run-off from stockpiles, solid waste, litter, etc.

EP4.10.2 Run off from construction camps

The Contractor shall ensure that polluted run-off (excluding silt "pollution"), such as run-off from construction camps where equipment is cleaned and/or serviced, fuel stores, workshops, etc. is not discharged overland. The Contractor may direct it into the local sewerage main, with the written permission of the Responsible Person. Alternatively, the Contractor shall erect an earth/brick berm 0,5 m high around such areas and shall collect all run-off from these areas and store it in a conservancy tank for removal from the site. The Contractor shall ensure that silt-laden water is not discharged directly into any surface watercourses (i.e. vleis, etc.), and shall take suitable measures to prevent this.

Natural run-off shall be diverted away from any camps towards the storm-water drains where these are available. Special care must be taken in areas susceptible to erosion, e.g. steep slopes. The Contractor shall ensure that excessive quantities of sand, silt and silt-laden water do not enter the storm-water drain system, or any surface watercourse. The Contractor shall take appropriate measures, e.g. the erection of silt traps, or drainage retention areas, to prevent silt and sand entering drainage or watercourses. Any partial or complete blockage of the storm-water drainage system shall be cleared by the Contractor at his / her own expense.

EP4.10.3 Discharge of construction water

Construction water refers to all water dirtied as a result of construction activities.

The Contractor may discharge silt laden water overland and allow this water to filter into the ground. However, s/he shall ensure that he does not cause erosion as a result of any overland discharge.

The Contractor may discharge limited quantities (less than 50L) of cement-laden water overland, i.e. washings from trowels, wheelbarrows and the like.

Water from washing large concrete-mixing equipment (mixers and the like) shall not be discharged overland. Such water shall be collected in a conservancy tank, removed from the site and disposed of in the correct manner. The Contractor may consider reusing such water for washing other concrete equipment to minimise the amount required to be removed off-site.

Trucks delivering concrete shall not wash the trucks or the chutes on the site. All washing operations shall take place off-site at a location where wastewater can be disposed of in the correct manner.

EP4.10.4 Servicing/fuelling of construction equipment

Servicing and fuelling should preferably occur off-site.

However, if these activities occur on site, the Contractor shall ensure that all servicing of vehicles and equipment takes place in designated areas agreed upon by the Responsible Person. All waste shall be collected and disposed of off-site at an appropriately licensed landfill site. All equipment that leaks onto the ground shall be repaired immediately or removed.

Similarly, no vehicles or machines shall be refuelled on site except at designated refuelling locations, unless otherwise agreed with the Responsible Person. The Contractor shall not change oil or lubricants anywhere on site except at designated locations, except if there is a breakdown or an emergency repair. In such instances, the

Contractor shall ensure that he has Drizit pads (or equivalent) and/or drip trays available to collect any oil, fluid, etc.

EP4.10.5 Fuels and chemicals

The Contractor shall take all reasonable precautions to prevent the pollution of the ground and/or water resources by fuels and chemicals as a result of his activities.

The Contractor shall keep the necessary materials and equipment on site to deal with ground spills of any of the materials used or stored on site.

The Contractor shall ensure that no oil, petrol, diesel, etc. is discharged onto the ground. Pumps and other machinery requiring oil, diesel, which is intended to remain in one position for longer than two days shall be placed on drip trays. The drip trays shall be emptied regularly and the contaminated water disposed of off-site at a facility capable of handling such wastewater. Drip trays shall be cleaned before any possible rain events that may result in the drip trays overflowing, and before long weekends and holidays.

The Contractor shall remove all oil-, petrol-, and diesel-soaked sand immediately and shall dispose of it as hazardous waste.

Should the Responsible Person/ECO and/or the relevant authorities deem it necessary to institute a programme for the removal of contaminated ground resulting from the non-compliance of the controls detailed above, these costs will be for the Contractor's account. Remedial action shall be approved by the ECO and relevant authorities, if appropriate.

EP4.11 Dust control

The Contractor shall be responsible for the continued control of dust arising from his/her operations, through measures including, but not limited to, spraying of water on bare areas, rotovating straw bales into the soil surface and the scheduling of dust-generating activities to times when wind velocity is low. Overhead sprayers shall not be used in windy conditions, due to water loss through evaporation. The use of water carts is preferred.

The Contractor shall inform the Responsible Person 48 hours in advance of anticipated "unavoidable" dust-generating activities. The Responsible Person and/or ECO may inform adjacent land users, tenants and communities about the possibility of dust pollution, and the approximate duration of the problem.

EP4.12 Noise control

The Contractor shall take all reasonable precautions to minimise noise generated on site as a result of his operations, especially when working in areas or on activities that may impact on neighbouring land users.

The Contractor shall comply with the applicable regulations with regard to noise.

The Contractor shall inform the Responsible Person 48-hours in advance of anticipated "unavoidable" noise-generating activities. The Responsible Person and/or Environmental Officer may inform adjacent land users, tenants and communities about the possibility of noise pollution and the approximate duration of the problem.

EP4.13 Materials use, handling, storage and transport

Procedure for material handling must be discussed with and approved by the Responsible Person prior to commencement of this activity.

EP4.13.1 Use of cement/concrete

The Contractor is advised that cement and concrete are regarded as highly hazardous to the natural environment on account of the very high pH of the material, and the chemicals contained therein. Therefore the Contractor shall ensure that:

- concrete is mixed on mortar boards, and not directly on the ground;

- visible remains of concrete, either solid, or from washings, are physically removed immediately and disposed of as waste. Washing visible signs into the ground is not acceptable; and
- all aggregate is also removed.

EP4.13.2 Fuel storage and use

Tanks containing fuels shall have lids and shall remain firmly shut. Only clean, empty tanks may be stored on the bare ground. Fuel stores shall be placed on a bunded sealed base - the bunds shall have a volume of 110% of the volume of the largest tank in the storage area. Any waste-water or spilled fuel collected within the bund shall be disposed of as hazardous waste.

The Contractor shall take all the necessary precautions to prevent fires or spills. No smoking shall be allowed in the vicinity of the fuel stores. Failure to adhere to this specification shall be cause for a spot fine being imposed on the offender.

The Contractor shall ensure that there is adequate fire-fighting equipment at the fuel stores.

EP4.13.3 Hazardous materials

The Contractor shall comply with all relevant national, regional and local legislation with regard to the transport, use and disposal of hazardous materials. If necessary, the Contractor shall obtain the advice of the manufacturer with regard to the safe handling of hazardous materials. Any claims against the Contractor shall be for his/her account.

The Contractor shall provide the Responsible Person with a list of hazardous substances on site, together with storage procedures for these materials.

The Contractor shall ensure that there is an emergency procedure to deal with accidents and incidents (e.g. spills) arising from hazardous substances. The Contractor shall report major incidents (spills in excess of 50 litres) to the Responsible Person immediately.

The Contractor shall maintain a register of spills or incidents involving hazardous materials, as well as measures taken.

The Contractor shall ensure that information on all hazardous substances is available to all personnel on site. The Contractor shall furthermore be responsible for the training of all personnel on site who will be handling the material about its proper use, handling and disposal.

EP4.13.4 Transport of materials outside the site

The Contractor shall comply with all the applicable local, regional and national by-laws with regard to road safety and the transport of materials, especially hazardous and/or toxic materials. Any claims against the Contractor shall be for his account.

The Responsible Person shall provide the Environmental Officer with a schedule of the proposed transportation of significant quantities of hazardous material onto the site, before commencing work on site. The Environmental Officer may request further details or notifications of specific material movements if considered necessary.

EP4.14 Emergency procedures

EP4.14.1 General

The Contractor shall ensure that emergency procedures are set up prior to commencing work. Emergency procedures shall include, but are not limited to, fire, spills, contamination of the ground, accidents to employees, use of hazardous substances, etc. Emergency procedures, including responsible personnel, contact details of emergency services, etc. shall be made available to all the relevant personnel and shall be clearly demarcated at the relevant locations around the site.

The Responsible Person shall advise the EO of any emergencies on site, together with a record of action taken.

EP4.14.2 Fire

The Contractor shall take all the necessary precautions to ensure that fires are not started as a result of his/her activities on site, and shall also comply with the requirements of the Occupational Health and Safety Act 85 of 1993.

No open fires shall be permitted on or off-site. Closed fires or stoves shall only be permitted at designated safe sites in the construction camps. Fires shall also not be permitted near any potential sources of combustion, such as fuel stores, stockpiles of plant material etc.

The Contractor is advised that sparks generated during welding, cutting of metal or gas cutting can cause fires. Every possible precaution shall therefore be taken when working with this equipment near potential sources of combustion. Such precautions include having an approved fire extinguisher immediately available at the site of any such activities.

The Contractor shall be liable for any expenses incurred by any organisations called to assist with fighting fires, and for any costs relating to the rehabilitation of burnt areas.

EP4.15 Social issues

EP4.15.1 Third party or public complaints

The Environmental Officer shall be responsible for responding to queries and/or complaints and may request assistance from the Responsible Person in this regard.

The Environmental Officer shall notify the Responsible Person of any complaints lodged by a third party, and request appropriate information and measures to address such complaints. The Environmental Officer shall be responsible for maintaining a complaints register in which all complaints are recorded, as well as action taken. This register shall be available to the Responsible Person and the Contractor on request.

EP4.15.2 Information sharing

The Responsible Person and/or the Contractor may need to make staff available for formal consultation with affected parties for the purpose of explaining the construction process and answering queries if necessary.

EP5 SITE CLEARANCE

EP5.1 Removal of topsoil

Following removal of vegetation from the site, all topsoil shall be removed (up to a maximum of 30-cm depth) and stock-piled for re-use in subsequent rehabilitation and landscaping activities. The stockpiles shall not be higher than 2-m in order to minimise composting. The stockpiles of topsoil shall be located in an area agreed with the Responsible Person.

EP5.2 Stabilisation of steep slopes

The disturbance of steep slopes, for example by the removal of vegetation, may result in slope instability and erosion by rain and surface run off. The Contractor shall ensure that slopes that are disturbed during construction are stabilised to prevent erosion occurring. Where re-vegetation of slopes is undertaken, this shall be in accordance with the specification provided in EP6.

Slopes that are susceptible to accidental damage during construction shall be protected to reduce the risk of disturbance.

Any erosion that does occur must be reinstated at the Contractor's cost.

EP5.3 Removal of alien vegetation

The Contractor shall clear all alien vegetation from areas within the demarcated site that are to be landscaped or which fall within open space or buffer zones (e.g. pipeline routes, road fringes).

EP6 SITE REHABILITATION

EP6.1 Scope

The Contractor shall be responsible for rehabilitating any areas cleared or disturbed for construction purposes that are to be incorporated into open space or buffer zones. The Contractor shall re-vegetate such areas in accordance with the specification provided below.

The Contractor shall stabilise, by straw rot ovation or other means, any areas that are cleared or disturbed for construction purposes which are not going to be incorporated into open space or buffer zones (i.e. areas that will be subsequently developed by another party).

All construction equipment and excess aggregate, gravel, stone, concrete, bricks, temporary fencing and the like shall be removed from the site upon completion of the work. No discarded materials of whatsoever nature shall be buried on the site or on any other land not owned by ACSA.

EP6.2 Landscaping and preparation for re-vegetation

Areas that require reshaping shall be cut, filled and compacted so as to follow the contours of the surrounding landscape. Topsoil removed from the area initially shall be replaced. Care must be taken not to mix the topsoil with the subsoil during shaping operations. Should a crust form on the soil before re-vegetation is commenced, the Contractor shall, at his own cost, loosen the crust by scarifying to a depth of 150-mm.

EP7 MANAGEMENT AND MONITORING

This section focuses on the systems and procedures required to ensure that the environmental specifications are effectively implemented. The emphasis is on monitoring, training and penalties/incentives aimed at ensuring compliance with this document. Suitable documentation and external checks are crucial to ensure compliance and methods to achieve this are also presented in this section.

EP7.1 General Inspection, Monitoring and Reporting

The Responsible Person shall:

- Inspect the site on a daily basis to ensure that the environmental specifications are adhered to.
- Provide the Environmental Officer with a monthly written report, detailing both compliance with the Environmental Specifications as well as general environmental performance.
- Maintain a record of major incidents (spills, impacts, complaints, legal transgressions etc) as well as corrective and preventive actions taken, for submission to the Environmental Officer at scheduled monthly report back meetings.
- Conduct regular internal audits to ensure that the system for implementation of the ES is operating effectively. The audit shall check that a procedure is in place to ensure that:
 - the Method Statements and Environmental Specifications being used are the up-to-date versions;
 - variations to the Environmental Specifications/Method Statements and non-compliances and corrective action are documented;
 - appropriate environmental training of personnel is undertaken; and
 - emergency procedures are in place and effectively communicated to personnel.
- Provide the required information to the Environmental Officer during external audits conducted, as part of the Environmental Management Systems auditing procedure. The information required will include the reports of internal audits conducted by the Responsible Person.

EP7.2 Environmental awareness training

EP7.2.1 Environmental awareness training prior to commencing work

An initial environmental awareness training workshop shall be held prior to any work commencing at the airport. The Responsible Person shall organise (deliver) the workshop and will record the names of those attending. It is recommended that the Contractor allow one hour for this workshop. The workshop shall be attended by all site staff, including sub-contractor's staff.

The Contractor is responsible for ensuring that personnel commencing work on site after the start of the contract (who therefore miss the initial workshop) are also made aware of the environmental procedures before commencing work.

The emphasis should be on any (potential) environmental impacts relating to the construction activities to be undertaken on site and the related environmental precautions, which need to be taken to avoid or mitigate these impacts. The contractual obligation to comply with the specifications in the Environmental Specifications must also be emphasised (some training material will be specific to certain sites or tenders).

A general environmental awareness programme aimed at all employees of the Contractor, sub-contractors and suppliers is available from the Environmental Officer.

EP7.2.2 Additional environmental awareness sessions

If there are persistent breaches of the specifications contained in the Environmental Specification and/or if new environmental issues arise during the course of construction, the Environmental Officer may require additional environmental training sessions. Attendance at these sessions will be determined by the EO, in consultation with the Responsible Person. The Contractor shall make provision for one hour a month for attendance (of construction staff) at these meetings.

EP7.3 Documentation

The Responsible Person shall ensure that all records of spills, pollution incidents, spot fines, training details etc. are copied to the Environmental Officer for his/her records. All documents shall be open for inspection by the Airport Environmental Committee (AEC).

The Environmental Officer shall ensure that a register of public complaints and action taken thereon, plus the relevant documentation from the Contractors, is maintained.

EP7.4 Incentives and penalties

EP7.4.1 Incentives

The Environmental Officer may identify a Contractor that is best implementing this Environmental Specifications and may make a (monthly) award to, or acknowledge, that Contractor.

EP7.4.2 Penalties

Spot fines shall be imposed by the Environmental Officer on Contractors who are found to be infringing these specifications. The Contractor shall be advised in writing of the nature of the infringement and the amount of the spot fine, and furthermore the Contractor shall determine how to recover the fine from the relevant employee and/or sub-contractor. The Contractor shall also take the necessary steps (e.g. training) to prevent a recurrence of the infringement and shall advise the Environmental Officer accordingly.

The Contractor is also advised that the imposition of spot fines does not replace any legal proceedings by the Council, authorities, land owners and/or members of the public may institute against the Contractor.

Spot fines shall be between R500 and R2000, depending upon the severity of the infringement. The decision on how much to impose will be made by the Environmental Officer, and will be final. In addition to the spot fine, the

Contractor shall be required to make good any damage caused as a result of the infringement at his/her own expense.

A preliminary list of infringements for which spot fines will be imposed is as follows:

- moving outside the demarcated site boundaries;
- littering of waste on site and surrounds and burying waste on site and surrounds;
- smoking in the vicinity of fuel storage and filling areas and in any other areas where flammable materials are stored/used;
- making fires outside designated areas;
- defacement of natural features;
- spillage onto the ground of oil, diesel, etc;
- picking/damaging plant material;
- damaging/killing wild animals; and
- additional fines as determined by the Environmental Officer.

The Responsible Person may also order the Contractor to suspend part or all the works if the Contractor repeatedly causes damage to the environment by not adhering to the ES (i.e. more than 3 cases of infringements). The suspension will be enforced until the offending actions, procedure or equipment is corrected. No extension of time will be granted for such delays and all costs will be borne by the Contractor.

EP7.5 External audit

Regular scheduled audits of the EMS will be conducted. However, this is not a dedicated audit of the implementation of this document (which is one of many components of the EMS). Nevertheless, it is anticipated that implementation of the terms and specifications contained in this document will be periodically audited as part of the EMS audit.

All documentation held by the Environmental Officer shall be available for the EMS audit at all times. Contractors shall also be required to provide any information required by the EMS auditors.

REFER TO ANNEXURE B FOR PROJECT SPECIFIC ENVIRONMENTAL MANAGEMENT PLAN

AIRSIDE PROJECT/WORK SAFETY PLAN

(OHS and Environmental Safety Plans to be submitted separately)

Contractor:

Project/work:

ACSA Dept.

- 1 Disruption to normal operations (Minimise)**
 - a. Hours of work
 - b. Information to Stakeholders in writing
 - c. NOTAM
- 2 Access**
 - a. Access point and route
 - b. Marking of Route
 - c. Movement area crossing points
 - d. Vehicle / Equipment control
 - e. Communication facilities
 - f. Escorts
- 3 Height restrictions**
 - a. Vehicles / Cranes
 - b. Operating heights of crane jibs
- 4 Aircraft movement area inspections : F&RS/Airside Safety**
 - a. Frequency
 - Areas open to a/c use
 - Areas closed to a/c use
 - b. Cleaning / sweeping
- 5 Site inspection**
 - a. Adherence to safety requirements
- 6 Marking of obstacles**
 - a. Hoarding / demarcation of site
 - b. Markings
 - c. Lighting
- 7 Safety training**
 - a. Airside Inductions
 - b. AVOP
 - c. OHS
 - d. Environment
- 8 Security Permits**
 - a. Personnel
 - b. Vehicles / equipment inspections
- 9 PPE**
 - a. Reflective jackets / vests
 - b. Ear protections

- 10 **Hot work permit – Fire & Rescue**
- 11 **Contractor staff briefings** (proof may be requested)
 - a. Precise area in which work may be done
 - b. Routes to be followed to and from working area
 - c. R/T procedures to be used
 - d. Escorting procedures and briefs
 - e. Safety precautions to be observed, e.g:
 - Maintenance of listening watch
 - Use of look-outs
 - f. Reporting procedure to be followed on completion of work
- 12 **Written warning to contractor of possible hazards to personnel**
(Attach copy)
e.g: - Jet blast; Noise
- 13 **List of mechanical equipment**
(Brief descriptions of equipment may be requested to enhance understanding.)
- 14 **Schedule of Contractors**
- 15 **General comments**

Compiled by:

Signature:

Date:

APPENDIX A

SITE INSPECTION PROTOCOL FOR CONSTRUCTION ACTIVITIES

The ACSA: Environmental Officer should audit one or more method statement per site (if applicable), as well as the general requirements of the Construction ES (see checklist overleaf) during a site inspection.

Project reference:.....
Contractor:.....
Responsible Person:.....
Date:.....

Method statement(s) audited:

Tick one box:

☐

method statement properly implemented

☐

method statement not properly implemented

If method statement not properly implemented, describe deviations/omissions/problems:

1.
2.
3.

Describe actions/plans to ensure proper implementation of the method statement:

1.
2.
3.

Other observations about implementation (if any):

1.

Signed..... (ACSA ECO)

Signed..... (Responsible Person)

Date:

Date:

SITE INSPECTION PROTOCOL FOR CONSTRUCTION ACTIVITIES

ISSUE	REQUIREMENT FOR COMPLIANCE		COMMENTS/ACTIONS
Site	Site boundary is clearly demarcated and activities undertaken within boundary.		
Toilets	Adequate toilets have been provided. These are secure and well maintained.		
Wastewater	Waste water is discharged to the reticulated system or to a conservancy tank which is emptied as required.		
Refuse	Site is generally tidy and free from litter.		
	No burning or burying waste.		
Natural features	No defacement of natural features to be protected in the site or the immediate surrounding area.		
Runoff	No polluted runoff from the site.		
	No pollution or erosion resulting from runoff of construction water.		
Fuels & chemicals	Servicing & fuelling occurs in designated place. No significant ground contamination.		
	Drip trays in place for pumps and other machinery in fixed location for at least 2 days.		
	Fuel stores on sealed base and adequately bunded.		
	Hazardous materials stored in an enclosed area or as agreed in method statement and appropriately labelled.		
	Spill clean-up materials available on site.		
	No significant spillage.		
Dust	No excessive dust which could cause a nuisance to employees or the public.		
Fire	No fires on site. Use of closed stoves or fires limited to construction camps.		
	Fire extinguishers available near any welding or metal cutting.		
Topsoil	Topsoil removed and stockpiled < 2m high.		
Stabilisation	Slopes stabilised as necessary to prevent erosion.		
Monitoring	Responsible Person's record of major incidents is up to date.		
Training	All Contractors' personnel are aware of environmental responsibilities.		
	Records of training maintained by Responsible Person.		

C3.7.3: Project CPG Strategy

C3.7.3.1 SCOPE

1. GOVERNMENT POLICY

The contractor shall achieve in the performance of the contract the Contract Skills Development Goal (CSDG) established in the **Standard for Developing Skills through Infrastructure Contracts** (published in GN 48491 or 28 April 2023). Refer to form C15 for the returnable document.

2. APPLICABLE LEGISLATION

All tenders will be considered with specific reference to applicable legislation in force from time to time and which are specifically applicable to organs of state for example the following:-

- 2.1 Public Finance Management Act No. 1 of 1999;
- 2.2 Preferential Procurement Policy Framework Act No. 5 of 2000;
- 2.3 The Constitution of South Africa
- 2.4 Broad-Based Black Economic Empowerment Act No. 53 of 2003
- 2.5 National Small Business Amendment Act No. 26 of 2003

C3.7.3.2 DEFINITIONS

- 1) **BBBEE**
Broad-Based Black Economic Empowerment
- 2) **BO**
Black Owned
- 3) **BWOYO**
Black Woman Owned, Youth Owned
- 4) **CIDB**
Construction Industry Development Board
- 5) **CPG**
Contract Participation Goals
- 6) **EME**
Exempted Micro Enterprise
- 7) **ISO**
Quality management systems standards
- 8) **JV**
Joint Venture
- 9) **NCDP**
National Contractors Development Programme
- 10) **PPPFA**
Preferential Procurement Policy Framework Act
- 11) **PWPDO**
Persons with Physical Disability Owned
- 12) **SADC**
Southern African Development Community
- 13) **PPM**
Project Portfolio Management

C3.7.3.3 CONTRACT PARTICIPATION

1. Contract Participation Goals (CPG)
CPG refers to the extent to which the contracted resources achieve predetermined transformation objectives, expressed as a percentage (%) of the contract value. Bidders are expected to achieve this target by the end of the project. CPG for this contract is 30%.
2. Bidders are to submit a transformation proposal meeting the CPG target for this contract.
3. 30% of the contract amount will be allocated to enterprises that are women owned, youth owned, PWPDO, or allocate to EME, QSE that are 51% black owned entities.
4. To facilitate achievement of target set out in 3, and transfer of skills, the tenderer **must** subcontract a minimum of **8%** of the contract value to CIDB Grade 1 to 6 CE contractors that are women owned, youth owned, PWPDO, or allocate to EME, QSE that are 51% black owned entities.

This is inline with the Standard for Indirect Targeting for Enterprise Development through Construction works Contracts, published in Gazette Notice No. 36190 of 25 February 2013.

5. In the event that the Contractor/consultant fails to substantiate that any failure to achieve the contract participation goal relating to the granting of a preference was due to quantitative underruns, the elimination of items, or any other reason beyond the Contractor's control which may be acceptable to the Employer, the Contractor/Consultant shall be liable to pay to the Employer a financial penalty calculated in the following manner:

$$P = (0,15 \times (D - Do) \times CA) / 100$$

- where D is the tendered contract participation goal percentage;
- Do is the contract participation goal which the Employer's representative, certifies based on the credits passed, as being achieved upon completion of the contract;
- CA is the contract amount.
- P is the monetary value of penalty payable

No financial award is due for over performance on CPG.

C3.7.4: REQUIREMENTS OF THE CIDB BUILD PROGRAMME

The contractor shall achieve in the performance of the contract the Contract Skills Development Goals (CSDG) as stated in the Standard for Developing Skills through Infrastructure Contracts (Published in GN 43495 of 20 March 2020)

CSDG shall be achieved in the performance of a contract in relation to the provision of different types of workplace opportunities linked to work associated with a contract which culminate in or lead to:

- a) **Method 1:** a part- or full occupational qualification registered on the National Qualification Framework;
- b) **Method 2:** a trade qualification leading to a listed trade (GG No. 35625, 31 August 2012);
- c) **Method 3:** a national diploma registered on the National Qualification Framework; and
- d) **Method 4:** registration in a professional category by one of the professional bodies listed in the standard.

This section shall be read concurrently with the Standard for Developing Skills through Infrastructure Contracts (Published in GN 43495 of 20 March 2020). The contractor shall comply with the provisions of the Standard for Developing Skills through Infrastructure Contracts for the contract duration.

The Construction Skills Development Goal shall be a minimum of 0.25% of the contract value for this contract. The contractor shall make use of the table below in preparing a proposal on how the CSDG will be met in this contract.

PC 1.2.12 in the bill of quantities has been allowed in the bill of quantities for CSDG over a period of 10 Months. This item is a time related item and shall be paid out monthly for over the contract duration.

The table below shall be used by the Contractor to propose the method in which the CSDG will be met. In the event of the Contractor failing to meet the relevant requirements and goals, the Contractor will be penalised as detailed in Item 5 of C3.7.3.3 above.

Skills Types	Number of Learners	*Notional Cost/ Learner/ Quarter (Rand)	Notional Cost /learner/ year (Rand)	Total Notional Cost over 10 Months Contract (Rand)
Method 1: a part- or full occupational qualification registered on the National Qualification Framework;				
Method 2: a trade qualification leading to a listed trade (GG No. 35625, 31 August 2012);				
Method 3: a national diploma registered on the National Qualification Framework;				
Method 4: registration in a professional category by one of the professional bodies listed in the standard.				
Total Cost (Cost of CSDG)				
CSDG Score % (Total cost of CSDG/Contract value Excluding VAT)				



AIRPORTS COMPANY SOUTH AFRICA

KING SHAKA INTERNATIONAL AIRPORT

TENDER NO: KSIA7806/2025/RFP

PROCUREMENT OF A CIDB GRADE 9 CE CONTRACTOR THE COMPLETION OF BRAVO TAXIWAY EXTENSION AT KING SHAKA INTERNATIONAL AIRPORT FOR A PERIOD OF 12 MONTHS

C4: SITE INFORMATION

C4.1 SCOPE AND DISCLAIMERS

C4.2 SITE DESCRIPTION

C4.3 CLIMATE DATA

C4.4 CONSTRUCTION CONSTRAINTS AND ENVIRONMENTAL CONDITIONS

C4.5 RESTRICTED ACCESS TO THE SITE OF THE WORKS

C4.6 TRAFFIC

C4.7 EXISTING PAVEMENT PROFILE AND MATERIAL CLASSIFICATION

C4.8 PROJECT SPECIFIC ANNEXURES

C4: SITE INFORMATION

C4.1. SCOPE AND DISCLAIMERS

The information contained in Part C4 is intended as an indication of the conditions likely to be encountered. All drawings, opinions, interpretations and suggested working methods given in this volume must be regarded as a guide. The results are given in good faith but no warranty is given that the information is representative of the entire airport or route, and no responsibility will be accepted for any consequence arising from actual conditions being different from those indicated in this volume.

This tender applies to the (a) Skills Development Standard. Although in the case of this standard there are no returnable documents, tenderers are sensitised that the proforma documents as listed below, shall be completed by the successful contractor after award of the contract within the stipulated period. (The proforma documents are provided in the tender data for information purposes only).

PRO-FORMA DOCUMENTS

Form A 1 List of Recognised Skills Development Agencies

Form A 2 Baseline Training Plan

Form A 3 Project Interim Report

Form A 4 Supervisor Agreement

Form A 5 Project Completion Report (CSDG).

Form A1 List of Recognised Skills Development Agencies

CIDB Recognised Skills Development Agencies								
No	Name of SDA	SDA Recognition Number	Status	Recognition End Date	Province	Contact Person	Contact Number	Email Address
01								
02								
03								
04								
05								
06								
07								
08								
09								
10								

CIDB SKILLS STANDARD BASELINE TRAINING PLAN

Contractor Details						
Contractor Name:						
CRS Number:						
Estimated start date						
Estimated Completion date						
Size of Organisation	Small (1-49 employees)		Medium (50-149 employees)		Large (≥150 employees)	

Contractor Contact Details	
Name of Contact Person	
Designation of Contact Person	
Contact Details	Cell Number:
	Landline Number:
	Email address:

Construction Skills Development Goal (CSDG) Baseline Training Plan					
Training Method	Number of Employed Learners	Number of Unemployed Learners	Area/s of Specialisation/Trade	Duration of Placement	Total Notional Cost
Total					

Note: Refer to Table 3 in the Standard for Developing Skills through Infrastructure Contracts Government Gazette 43495 of 3 July 2020 for the notional costs

Contractor's
Representative
Name:

Designation:

Signature:

Date:

Employer's
Representative
Name:

Designation:

Signature:

Date:

Form A 3 Project Interim Report

cidb PROJECT ASSESSMENT SCHEME: STANDARD FOR DEVELOPING SKILLS PROJECT INTERIM TRAINING REPORT																																						
Section A: Employer Information																																						
cidb Employer Number																																						
Employer Name																																						
Section B: Contract Data																																						
cidb Contract Number																																						
Contract Title																																						
Tender Value (R)																																						
Contract Skills Development Goal (R)																																						
SIP Number (If Applicable)																																						
SIP Project Code (If Applicable)																																						
Definitions:																																						
Training Methods: Method 1: structured workplace learning opportunities for learners towards the attainment of a part or a full occupational qualification; Method 2: structured workplace learning opportunities for apprentices or other artisan learners towards the attainment of a trade qualification leading to a listed trade subject to at least 60% of the artisan learners being holders of public TVET college qualifications; Method 3: work integrated learning opportunities for University of Technology or Comprehensive University students completing their national diplomas; Method 4: structured workplace learning opportunities for candidates towards registration in a professional category by a statutory council listed in Table 1 above																																						
Learner/Candidates Full Name and Surname	Gender		Ethnic Group					Identity Number												Training Method (Please tick)				Placement Start Date	Placement End Date	Occupation Description	Description of Practical Task Completed (as per logbook or POE)	Status	Supporting documents available on request (Please tick)									
	Male	Female	Black	White	Coloured	Indian	Other													M1	M2	M3	M4						Learner Training Plan	Attendance Register	Signed Logbooks/POE	Medical Assessments	Induction	Health and Safety Training	PPE Register			
	Eg. Joe Smith	1			1			1	2	3	4	5	6	7	4	5	6	8	9	1		X			01 May 2016	31 May 2016	Bricklaying	Read and interpret drawings Set out building as per drawing Transfer levels using dumpy level Batch and mix concrete	Completed In progress In progress Completed	x	x	x	x	x	x	x		

Form A 4 Supervisor Agreement

[illegible]

C4.2. SITE DESCRIPTION

C4.2.1 General

The general locality of the main facilities is indicated in the diagram below:



Figure 1: Map of KSIA with description of the facility usage in colour codes

C4.3 CLIMATE DATA

King Shaka International Airport in KwaZulu-Natal experiences an average annual rainfall of approximately 1,000 millimetres, with a wetter season from October to March and a drier season from April to September. The wettest months are December and February, each receiving around 89 millimetres of rainfall, while June is the driest month, averaging only 15 millimetres. The peak rainy period occurs during the summer months of December, January, February, and March, while the driest period falls in winter, from June to August. The likelihood of rainfall is highest between October and March, with a daily wet probability exceeding 24%, whereas the driest month, July, averages only 2.3 days of rain. These seasonal patterns influence the region’s climate, making summer the most humid and rainy period, while winter remains relatively dry. Climate data is presented in Figures 2 and 3.

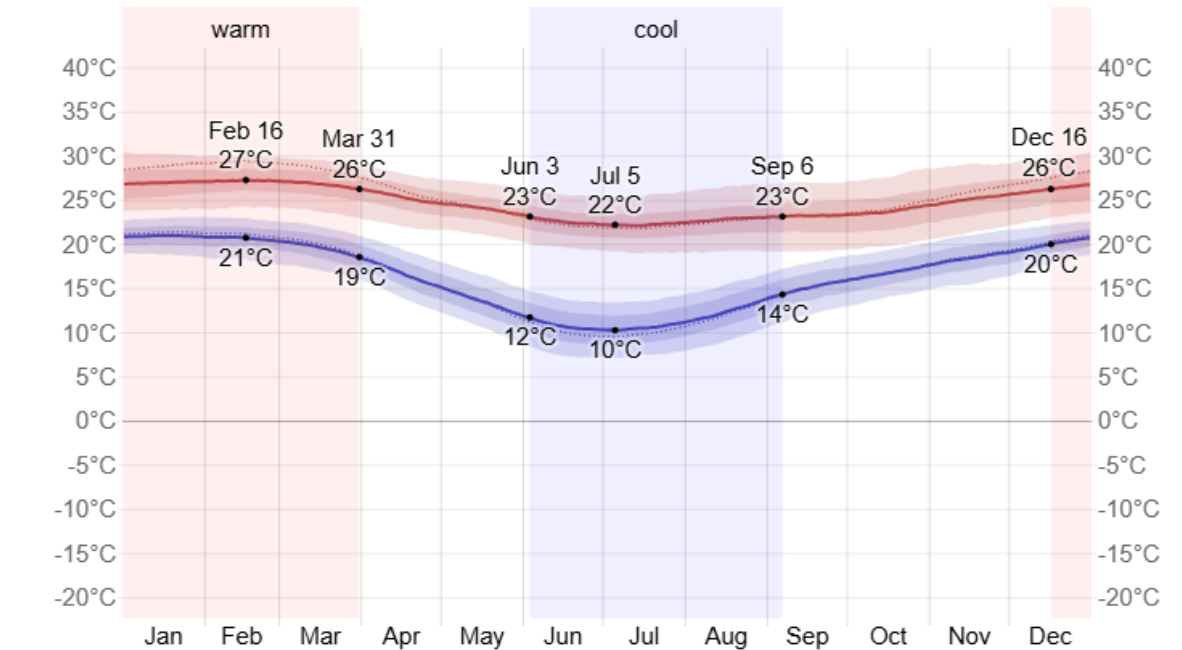


Figure 2: Average Air Temperatures (Weatherspark.com 2025)

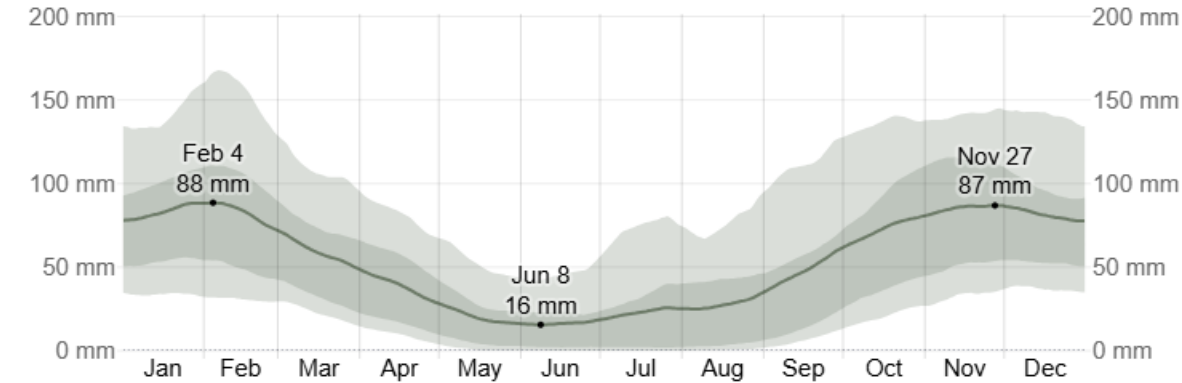


Figure 3: Average Monthly Rainfall (Weatherspark.com 2025)

C4.4 CONSTRUCTION CONSTRAINTS AND ENVIRONMENTAL CONDITIONS

The following climatic aspects are of significance to the construction and performance of the asphalt work and others:

- During the summer, rainfall occurs mostly in the form of high intensity thunderstorms, the month that should have the least disruption on construction activities is May to November. The rest of the month's rain delays can be expected with the highest delays in December to February.
- Asphalt temperatures cool very rapidly when being placed during days when the temperature drops to below 5°C and, it might be difficult to achieve effective compaction of thin asphalt and surfacing layers. Bitumen's are also sensitive for these conditions with possible stripping of stone particularly for night work during the winter months.

It is undesirable to construct the asphalt in very cold weather, which highlights the importance of planning in months May, June, July and August as previously mentioned, asphalt premix work will be severely constrained with the minimum temperature falling below 5°C.

- Very low temperatures increase the stiffness of asphalt mixes and also the brittleness of the mixes. This can lead to early fatigue and shrinkage cracking if design principles are ignored.
- Consistently high air temperatures (> 25°C,) during the summer can result in the softening of the asphalt leading to rutting (deformation) in the upper asphalt under slow moving (creep load) with high tyre pressures. Special attention needs to be given to asphalt and bitumen properties, considering the choice of binder and mix stability.

C4.5 RESTRICTED ACCESS TO THE SITE OF THE WORKS

C4.5.1 Restricted Areas

The contractor will have restricted access to the works at any given time because simultaneous closure of the runway and taxiways during normal operational hours will not be permitted.

Although the entire site will be handed to the Contractor at the start of the contract, the airport manager and the air traffic controller have the right to decide at short notice where on the site the Contractor may work. Works on all Aprons and Taxiways will remain operational and has access on the runway.

C4.5.2 Access Point and Routes

The designated access point for plant and personnel will be provided to the contractor. The Contractor will be required to provide 24 hour security at these Gates. The security stall at this Gate will be in radio contract with Fire & Rescue at all times to enable the provision of escort services.

Construction material must be delivered via the temporary access gate to the site camp under escort service. The Contractor shall erect, maintain, move and finally remove temporary barriers, fences, signs and markings, all as prescribed by the airport authorities. The Contractor shall ensure that all barricades, markers and signs are placed under escort, prior to entering a work area for construction purposes.

Movement outside the areas demarcated for construction shall not be permitted, unless special arrangements have been made and approved by the AM.

C4.6 TRAFFIC

A straight-line simplification of the rebound is done here simply to provide the traffic figures for pavement design calculation some form of normalcy with a steady growth rate.

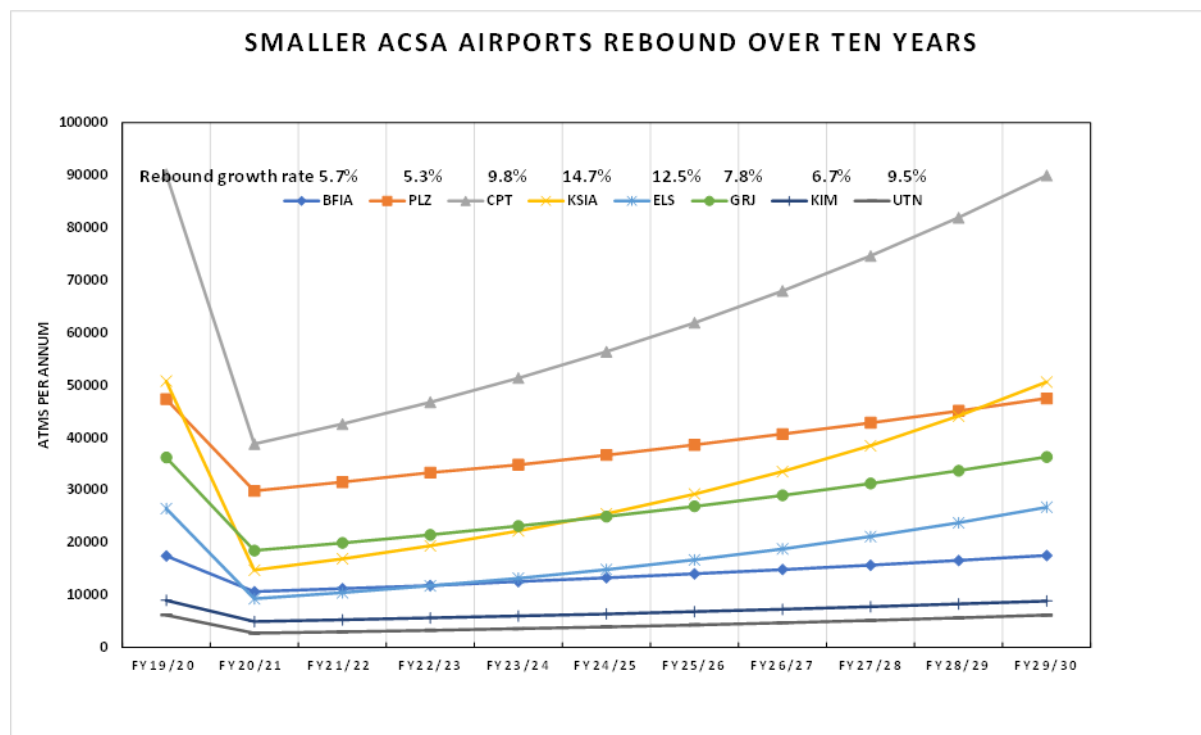


Figure 4: Rebound modelling of ATMs of smaller 8 ACSA airports

The traffic distribution per runway, per taxiway, per taxi-lane and on the aprons is still to be determined. The distribution or weight per airside element, are assigned via logical travel paths following such annual arrivals and departures and are assigned per aircraft type. These weights are shown in the bottom line of Table 1.

Table 1: Directions of departure and arrivals

KSIA Traffic			Runway 06/24	Alpha TWY	Bravo TWY	Charlie TWY	Echo TWY	Forestar TWY	November TWY	Papa TWY	Apron Alpha Concrete (200x65m)	Apron Bravo Concrete (200x65m)
Plane	Departure Percentage	Operations										
Airbus A319	2.10	381	381	286	152	133	76	95	38	38	191	191
Airbus A320	11.79	2139	2139	1604	856	749	428	535	214	214	1070	1070
Airbus A332	0.01	1	1	1	0	0	0	0	0	0	1	1
Airbus A330-300	0.45	82	82	62	33	29	16	21	8	8	41	41
Airbus A350-1000	0.04	7	7	5	3	2	1	2	1	1	4	4
Airbus A350-900	0.90	164	164	123	66	57	33	41	16	16	82	82
Boeing 737-400	8.76	1589	1589	1192	636	556	318	397	159	159	795	795
Boeing 737	0.09	17	17	13	7	6	3	4	2	2	9	9
Boeing 737-800	49.76	9025	9025	6769	3610	3159	1805	2256	903	903	4513	4513
Boeing 777-300	0.04	7	7	5	3	2	1	2	1	1	4	4
Boeing 777-200ER	0.02	4	4	3	2	1	1	1	0	0	2	2
Boeing 777-300ER	2.40	435	435	326	174	152	87	109	44	44	218	218
Berlev Be-1	1.20	218	218	164	87	76	44	55	22	22	109	109
Beechcraft 1900	1.09	198	198	149	79	69	40	50	20	20	99	99
Bombardier CL 600	1.85	335	335	251	134	117	67	84	34	34	168	168
Cessna CR1	0.92	166	166	125	66	58	33	42	17	17	83	83
Bombardier CRJ100/200	0.06	10	10	8	4	4	2	3	1	1	5	5
CRJ700	0.04	8	8	6	3	3	2	2	1	1	4	4
CRJ900	2.70	489	489	367	196	171	98	122	49	49	245	245
Airco DH.1	0.04	8	8	6	3	3	2	2	1	1	4	4
DHA-3 Drower	0.39	71	71	53	28	25	14	18	7	7	36	36
Airco DH4	0.78	141	141	106	56	49	28	35	14	14	71	71
DH.18	4.86	882	882	662	353	309	176	221	88	88	441	441
Embraer E170	0.78	142	142	107	57	50	28	36	14	14	71	71
Embraer E190	3.37	612	612	459	245	214	122	153	61	61	306	306
Embraer E195	0.10	18	18	14	7	6	4	5	2	2	9	9
Embraer ERJ 135	0.23	42	42	32	17	15	8	11	4	4	21	21
Embraer RJ140	5.17	938	938	704	375	328	188	235	94	94	469	469
Jetstream 41	0.04	8	8	6	3	3	2	2	1	1	4	4
Weight distribution per air side element of ATMs			1	0.75	0.4	0.35	0.2	0.25	0.1	0.1	0.5	0.5

C4.7 EXISTING PAVEMENT PROFILE AND MATERIAL CLASSIFICATION

The test-pit profile and material descriptions are shown in the tables below. The test pit material profiles for Bravo Taxiway and Greenfield are described to be wet in the base and subbase. For Taxiway Bravo and Greenfields, the test pits are described as moist and slightly moist in the base, subbase and lower layers. The presence of moisture in the test pits as described is indicative of possible subsoil drainage issues. This could be linked to what was observed during the visual assessment of defects such as ponding spots, fines materials and water pumping through surface cracks and deterioration of the pavement layer works.

The observed existence of wetness/moistness in the pavement layers is an indication of a poor subdrainage systems which is not effective in ensuring protection of layer works against water ingress.

A perched water table (just above the sandstone bedrock) is likely to occur at depths typically in the range 0.5 to 2.5 metres below EGL.

Table 2: Test Pit Profile 1 – Centre of Bravo Taxiway

Depth (mm)	Description
<u>0mm</u>	
<u>90mm</u>	0- 90mm: Dark Grey, BTB, Asphalt
<u>220mm</u>	130mm Slightly Moist, Dark Grey, Slightly Dense, Intact, Crushed Dolerite, no reaction with HCL acid and no colour change with Phenolphthalein, sample no: D17158 (COLTO: 1998 – G7)
<u>501mm</u>	281mm Moist, Dark Brown, Dense, Uniform, Crushed Dolerite, Cement, no reaction with HCL acid and colour change with Phenolphthalein, sample no: D17159 (COLTO: 1998 – G6)
<u>740mm</u>	239mm Very Moist, Dark Brown, Very Dense, Highly to Completely Weathered Dolerite Rock, Clay, no reaction with HCL acid and no colour change with Phenolphthalein, sample no: D17160 (COLTO: 1998 – G6)
<u>1000mm</u>	260mm Very Moist, Dark Yellowish Brown, Very Dense, Highly to Completely Weathered Dolerite, Clay Sand, no reaction with HCL acid and no colour change with Phenolphthalein, sample no: D17161 (COLTO: 1998 – >G9)
Excavation stopped at -1000mm below existing ground level by means of pick and shovel supplemented by power tools	

Table 3: Test Pit Profile 2 – Centre of Bravo Taxiway

Depth (mm)	Description
<u>0mm</u>	
<u>100mm</u>	0-100mm: Dark Grey, BTB, Asphalt
<u>250mm</u>	150mm Moist, Dark Grey, Dense, Intact, Crushed Dolerite, no reaction with HCL acid and no colour change with Phenolphthalein, sample no: D17162 (COLTO: 1998 – G5)
<u>470mm</u>	220mm Moist, Dark Brown, Dense, Intact, Crushed Dolerite, Cement, no reaction with HCL acid and turns PINK with Phenolphthalein, sample no: D17163 (COLTO: 1998 - G6)
<u>1000mm</u>	530mm Very Moist, Dark Brown, Very Dense, Uniform, Highly to Completely Weathered Dolerite, Clayey Sand, no reaction with HCL acid and no colour change with Phenolphthalein, sample no: D17164 (COLTO: 1998 – G6)
Excavation stopped at -1000mm below existing ground level by means of pick and shovel supplemented by power tools	

Table 4: Test Pit Profile 3 – Centre of Bravo Taxiway

Depth (mm)	Description
<u>0mm</u>	
<u>100mm</u>	0-100mm: Dark Grey, BTB, Asphalt,
<u>240mm</u>	140mm Moist, Dark Greyish, Dense, Intact, Crushed Dolerite, no reaction with HCL acid and does not change color with Phenolphthalein, sample no: D17170 (COLTO: 1998 – G7)
<u>520mm</u>	280mm Moist, Dark Brown, Dense, Uniform, Crushed Dolerite, Cement, no reaction with HCL acid and turns PINK with Phenolphthalein, sample no: D17171 (COLTO: 1998 - G6)
<u>800mm</u>	280mm Very Moist, Dark Brown, Very Dense, Uniform, Highly to Completely Weathered Dolerite, Clayey, no reaction with HCL acid and does not change color with Phenolphthalein, sample no: D17172 (COLTO: 1998 – G7)
<u>1000mm</u>	200mm Wet, Dark Reddish Brown, Very Dense, Intact, Clayey Ferricrete, Highly Weathered Dolerite Cobble, no reaction with HCL acid and does not change color with Phenolphthalein, sample no: D17173 (COLTO: 1998 - >G9)
Excavation stopped at -1000mm below existing ground level by means of pick and shovel supplemented by power tools.	

Table 5: Test Pit Profile 4 – Left Hand Side of Bravo Taxiway

Depth (mm)	Description
<u>0mm</u>	
<u>40mm</u>	0-40mm: Dark Grey, Wearing Course Asphalt
<u>240mm</u>	240mm Moist, Light Brownish Grey, Dense, Intact, Crushed Dolerite, no reaction with HCL acid and does not change color with Phenolphthalein, sample no: D17174 (COLTO: 1998 – G7)
<u>540mm</u>	300mm Moist, Dark Brown, Very Dense, Uniform, Highly Weathered Dolerite, Cement, no reaction with HCL acid and turns PINK with Phenolphthalein, sample no: D17175 (COLTO: 1998 – G7)
<u>730mm</u>	190mm Very Moist Wet, Dark Brownish Grey, Wet, Uniform, Highly to Completely Weathered Dolerite, no reaction with HCL acid and does not change color with Phenolphthalein, sample no: D17176 (COLTO: 1998 – G8)
<u>1000mm</u>	270mm Very Moist Wet, Dark Yellowish Brown, Wet, Uniform, Clayey Sand, Ferricrete, no reaction with HCL acid and does not change color with Phenolphthalein, sample no: D17177 (COLTO: 1998 - >G9)
Excavation stopped at -1000mm below existing ground level by means of pick and shovel supplemented by power tools	

Table 6: Test Pit Profile 5 – Right Hand Side of Bravo Taxiway

Depth (mm)	Description
<u>0mm</u>	
<u>50mm</u>	0-50mm Dark Grey, Wearing Course Asphalt
<u>275mm</u>	225mm Slightly Moist, Light Brown, Slightly Dense, Intact, Highly to Completely Weathered Dolerite, no reaction with HCL acid and does not change color with Phenolphthalein, sample no: D171783 (COLTO: 1998 – G6)
<u>580mm</u>	305mm Slightly Moist, Dark Brownish Grey, Slightly Dense, Uniform, Weathered Dolerite, Cement, no reaction with HCL acid and turns PINK with Phenolphthalein, sample no: D17184 (COLTO: 1998 – >G9)
<u>745mm</u>	165mm Moist, Dark Brownish Grey, Dense, Uniform, Weathered Dolerite, Clay, Ferricrete, no reaction with HCL acid and does not change color with Phenolphthalein, sample no: D17185 (COLTO: 1998 – G6)
<u>1000mm</u>	255mm Moist, Dark Brownish Red, Very Dense, Uniform, Ferricrete, Clay Sand, no reaction with HCL acid and does not change color with Phenolphthalein, sample no: D17186 (COLTO: 1998 - >G9)
Excavation stopped at -1000mm below existing ground level by means of pick and shovel supplemented by power tools	

Table 7: Test Pit Profile 6 – Centre of the Greenfields

Depth (mm)	Description
<u>0mm</u>	
<u>230mm</u>	0-230mm: Moist, Dark Orangish Brown, Very Dense, Silty Clay Sand, sample no: D17187 (COLTO: 1998 – >G9)
<u>630mm</u>	400mm Moist, Dark Brown, Very Dense, Silty Clayey Sand, Weathered Dolerite, no reaction with HCL acid and does not change color with Phenolphthalein, sample no: D17188 (COLTO: 1998 – >G9)
<u>840mm</u>	210mm Very Moist, Dark Brownish Orange, Very Dense, Clayey Silty Sand, no reaction with HCL acid and does not change color with Phenolphthalein, sample no: D17189 (COLTO: 1998 – >G9)
<u>1000mm</u>	160mm Very Moist, Dark Orangish Brown, Very Dense, Silty Clayey Sand, no reaction with HCL acid and does not change color with Phenolphthalein, sample no: D17190 (COLTO: 1998 – G8)
Excavation stopped at -1000mm below existing ground level by means of pick and shovel supplemented by power tools	

Table 8: Summary of test pit results of airside elements

Test Pit	Depth	Description	GM	PI	LS %	Mat. Class TRH14	MOD (kg/m3)	OMC	CBR @ %					
									100	98	97	95	93	90
TP1	0.090 to 0.220	Dark Grey, Slightly Crushed Dolerite	2.7	5	2	G6	2347	4.4	113	91	82	66	54	39
TP1	0.220 to 0.501	Dark Brown, Crushed Dolerite, Cement	2.6	NP	0	G6	2083	8.8	82	60	52	38	28	18
TP1	0.501 to 0.740	Dark Brown, Highly to Completely Weathered Dolerite Rock, Clay,	2.6	9	4	G6	2243	5.2	59	46	41	32	25	17
TP1	0.740 to 1.000	Dark Yellowish Brown, Highly to Completely Weathered Dolerite, Clay Sand,	2.3	8	4	-	2112	7.5	9	6	5	4	2	1
TP2	0.100 to 0.250	Dark Grey, Crushed Dolerite	2.58	4	2	G5	2390	4.6	141	104	89	66	49	31
TP2	0.250 to 0.470	Dark Brown, Crushed Dolerite, Cement,	2.6	7	3	G5	2332	8.1	82	70	64	55	46	36
TP2	0.470 to 1.000	Dark Brown, Highly to Completely Weathered Dolerite, Clayey Sand,	2.6	6	3	G5	2344	6.2	129	88	74	51	36	21
TP3	0.100 to 0.240	Dark Greyish, Crushed Dolerite,	2.7	7	3	G6	2299	4.4	110	80	68	50	36	22
TP3	0.240 to 0.520	Dark Brown, Crushed Dolerite, Cement,	2.6	9	4	G5	2398	6.8	124	94	82	62	47	31
TP3	0.520 to 0.800	Dark Brown, Highly to Completely Weathered Dolerite, Clayey,	2.7	11	5	G7	2138	6.7	82	53	42	27	18	9
TP3	0.800 to 1.000	Dark Reddish Brown, Clayey Ferricrete, Highly Weathered Dolerite Cobble	1	12	6	-	2035	9.4	20	11	8	4	2	1

Test Pit	Depth	Description	GM	PI	LS %	Mat. Class TRH14	MOD (kg/m3)	OMC	CBR @ %					
									100	98	97	95	93	90
TP4	0.040 to 0.240	Light Brownish Grey, Crushed Dolerite,	2.7	7	3	G6	2383	5.3	116	83	71	51	36	22
TP4	0.240 to 0.540	Dark Brown, Highly Weathered Dolerite, Cement,	2.7	SP	2	G6	2250	2.4	134	95	80	56	40	24
TP4	0.540 to 0.730	Dark Brownish Grey, Highly to Completely Weathered Dolerite,	2.7	SP	2	G8	2250	2.4	17	16	15	15	14	13
TP4	0.730 to 1.000	Dark Yellowish Brown, Clayey Sand, Ferricrete,	2.7	SP	2	-	2250	2.4	2	2	2	1	1	1
TP5	0.050 to 0.275	Light Brown, Highly to Completely Weathered Dolerite,	2.6	10	5	G6	2398	7.3	109	92	85	72	61	47
TP5	0.275 to 0.580	Dark Brownish Grey, Weathered Dolerite, Cement	2.8	SP	1	G6	2208	4.2	89	68	60	46	36	24
TP5	0.580 to 0.745	Dark Brownish Grey, Weathered Dolerite, Clay, Ferricrete,	2.6	9	4	G7	2147	8.8	54	43	38	29	23	16
TP5	0.745 to 1.000	Dark Brownish Red, Ferricrete, Clay Sand,	1.4	11	5	-	2128	9.3	42	24	18	10	6	2
TP6	0.000 to 0.230	Dark Orangish Brown, Silty Clay Sand.	0.5	5	2	G10	1955	8	7	6	5	4	4	3
TP6	0.230 to 0.630	Dark Brown, Silty Clayey Sand, Weathered Dolerite	0.4	6	3	G10	1976	8.8	33	22	18	12	8	4
TP6	0.630 to 0.840	Dark Brownish Orange, Clayey Silty Sand	0.4	4	2	G10	1950	8.5	21	15	12	9	6	3
TP6	0.840 to 1.000	Dark Orangish Brown, Silty Clayey Sand.	1	5	2	G9	2080	9.5	44	31	25	18	12	7

C4.8 PROJECT SPECIFIC ANNEXURES

THE FOLLOWING PROJECT SPECIFIC ANNEXURES FORMS PART OF VOLUME 3 OF THE TENDER DOCUMENTATION AND SHALL BE READ IN CONJUNCTION WITH ALL VOLUMES.

- **ANNEXURE A – OCCUPATIONAL HEALTH AND SAFETY – PROJECT SPECIFIC INFORMATION**
- **ANNEXURE B – ENVIRONMENTAL MANAGEMENT INFORMATION – PROJECT SPECIFIC INFORMATION**
- **ANNEXURE C – KING SHAKA INTERNATIONAL AIRPORT SERVICE LAYOUTS**
- **ANNEXURE D – ELECTRICAL GENERATOR SPECIFICATION**