

NEC3 Engineering Construction Contract

A contract between AIRPORTS COMPANY SOUTH AFRICA SOC LIMITED

Applicable at O.R. TAMBO INTERNATIONAL AIRPORT

(Reg No.: 1993/004149/30)

and

(Registration Number: _____)

**for ILS Replacement at O R Tambo International Airport for a
period of 36 months**

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Documentation prepared by:

C1 Agreements & Contract Data

C1.1 Form of Offer and Acceptance

Offer

The Employer, identified in the Acceptance page signature block on the next page, has solicited offers to enter into a contract for the procurement of **ILS Replacement at O R Tambo International Airport for a period of 36 months**.

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

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

The offered total of the Prices exclusive of VAT is	
Value Added Tax @ 15% is	
The offered total of the Prices inclusive of VAT is	
(in words)	

This Offer may be accepted by the Employer by signing the form of Acceptance overleaf and returning one copy of this document including the Schedule of Deviations (if any) to the tenderer before the end of the period of validity stated in the Tender Data, or other period as agreed, whereupon the tenderer becomes the party named as the Contractor in the conditions of contract identified in the Contract Data.

Signature(s)

Name(s)

Capacity

**For the
tenderer:**

(Insert name and address of organisation)

Name &
signature of
witness

Date

Tenderer's CIDB registration number (if applicable)

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 1 Agreements and Contract Data, (which includes this Form of Offer and Acceptance)
- Part 2 Pricing Data
- Part 3 Scope of Work: Works Information
- Part 4 Site Information

and drawings and documents (or parts thereof), which may be incorporated by reference into the above listed Parts.

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

The tenderer shall within one week of 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 securities, bonds, guarantees, proof of insurance and any other documentation to be provided in terms of the conditions of contract identified in the Contract Data at, or just after, the date this Agreement comes into effect. Failure to fulfil any of these obligations in accordance with those terms shall constitute a repudiation of this Agreement.

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(s)

Name(s)

Capacity

**for the
Employer**

Airports Company South Africa SOC Limited
 O.R. TAMBO International Airport
 Southern Office Block
 Western Cape
 South Africa
 7525

(Insert name and address of organisation)

Name &
signature of
witness

Date

Note: If a tenderer wishes to submit alternative tender offers, further copies of this document may be used for that purpose, duly endorsed, 'Alternative Tender No. _____'

Schedule of Deviations

1 Subject	
Details	
.....	
.....	
.....	
2 Subject	
Details	
.....	
.....	
.....	
3 Subject	
Details	
.....	
.....	
.....	

By the duly authorised representatives signing this Schedule of Deviations below, the Employer and the tenderer agree to and accept this Schedule of Deviations as the only deviations from and amendments to the documents listed in the Tender Data and any addenda thereto listed in the Tender Schedules, as well as any 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 Form shall have any meaning or effect in the contract between the parties arising from this Agreement.

• **For the tenderer:**

• **For the Employer**

Signature

Name

Capacity

On behalf of
(Insert name and address of organisation)

Name & signature of witness

Date

Airports Company South Africa SOC Limited
O.R. TAMBO International Airport
Administration Office
Southern Office Block
Western Cape
South Africa
7525

C1.2 Contract Data**Data provided by the *Employer***

Clause	Statement	Data
1	General	
	The <i>conditions of contract</i> are the core clauses and the clauses for main Option	
		B: Priced contract with bill of quantities
	dispute resolution Option	W1: Dispute resolution procedure
	and secondary Options	
		X2 Changes in the law
		X5: Sectional Completion
		X7: Delay damages
		X13: Performance Bond
		X15: Limitation of <i>Contractor's</i> liability for design to reasonable skill and care
		X17: Low-performance damages
		X18: Limitation of liability
		Z: <i>Additional conditions of contract</i>
	of the NEC3 Engineering and Construction Contract, April 2013 (ECC3)	
10.1	The <i>Employer</i> is (Name):	Airports Company South Africa SOC Limited (reg. no: 1993/004149/06), a juristic person incorporated in terms of the company laws of the Republic of South Africa
	Address	Registered office at Western Precinct, Aviation Park, O.R. Tambo International Airport, 1 Jones Road, Kempton Park, Gauteng, South Africa, 1632
10.1	The <i>Project Manager</i> is: (Name)	[•]
	Address	[•]
	Tel	[•]
	Fax	[•]
	e-mail	[•]
11.2(13)	The <i>works</i> are	ILS Replacement at O R Tambo International Airport for a period of 36 months

11.2(14)	The following matters will be included in the Risk Register	• Delivery delays • Airside Operations impact • Safety						
11.2(15)	The <i>boundaries of the site</i> are	O.R. TAMBO International Airport - Airside						
11.2(16)	The Site Information is in	Part 4: Site Information						
11.2(19)	The Works Information is in	Part 3: Scope of Work and all documents and drawings to which it makes reference.						
12.2	The <i>law of the contract</i> is the law of	the Republic of South Africa						
13.1	The <i>language of this contract</i> is	English						
13.3	The <i>period for reply</i> is	2 weeks						
2	The Contractor's main responsibilities	Data required by this section of the core clauses is provided by the Contractor in Part 2 and terms in italics used in this section are identified elsewhere in this Contract Data.						
3	Time							
11.2(3)	The <i>completion date</i> for the whole of the works is	36 months after contract signing by ACSA						
30.1	The <i>access dates</i> are:	<table> <tr> <th colspan="2">Part of the Site</th><th>Date</th></tr> <tr> <td>1</td><td>Airside</td><td>Contract signing date</td></tr> </table>	Part of the Site		Date	1	Airside	Contract signing date
Part of the Site		Date						
1	Airside	Contract signing date						
31.1	The Contractor is to submit a first programme for acceptance within	4 weeks of the Contract Date.						
31.2	The <i>starting date</i> is	Upon signing of the contract by ACSA.						
32.2	The Contractor submits revised programmes at intervals no longer than	1 week.						
35.1	The <i>Employer</i> is not willing to take over the works before the Completion Date.							
4	Testing and Defects							
42.2	The <i>defects date</i> is	52 weeks after Completion of the whole of the works.						
43.2	The <i>defect correction period</i> is	4 weeks						
47	The Contractor submits a quality plan for acceptance within:	4 weeks of the Contract Date.						
5	Payment							
50.1	The <i>assessment interval</i> is	between the 30 days of each successive month.						
51.1	The <i>currency of this contract</i> is the	South African Rand.						
51.2	The period within which payments are made is	4 weeks upon receipt of a valid tax invoice.						
6	Compensation events							

60.1(13) The place where weather is to be recorded is:

Any place the contract prefers, it must be retrievable or available immediately when required

The *weather measurements* to be recorded for each calendar month are,

the cumulative rainfall (mm)

the number of days with rainfall more than 10 mm

the number of days with minimum air temperature less than 0 degrees Celsius

the number of days with snow lying at 09:00 hours South African Time

and these measurements:

The *weather measurements* are supplied by

South African Weather Services

The *weather data* are the records of past *weather measurements* for each calendar month which were recorded at:

O R Tambo International Airport

and which are available from:

the South African Weather Services and included in Annexure A to this Contract Data provided by the *Employer*

60.1(13) Assumed values for the ten-year return *weather data* for each *weather measurement* for each calendar month are:

As stated in Annexure A to this Contract Data provided by the *Employer*.

7 Title

There is no reference to Contract Data in this section of the core clauses and terms in italics used in this section are identified elsewhere in this Contract Data.

8 Risks and insurance

80.1 These are additional *Employer's* risks

1. Financial

2. Safety

3. Construction

81.1 The Contractor's Risk

Add:

Definition of Force Majeure -

The following additional conditions must satisfied:

(1) The Contractor has engaged with the persons responsible for the riot, commotion, disorder, strike or lockout; has met with the persons or leaders; and has recorded the persons or leaders details, their grievances, the organisations involved, all threats made; and has requested the persons or leaders to cease all unlawful conduct; and

(2) The Contractor has obtained proof of the riot, commotion, disorder, strike or lockout, and of any unlawful conduct; and

		(3) <i>The Contractor has reported all threats and unlawful conduct to the South African Police Service; and</i> (4) <i>The Contractor has brought an urgent application to the court on an ex parte basis that correctly identify the respondents and define the unlawful conduct to be interdicted; and</i> (5) <i>The Contractor has ensured that the court order is enforced.</i>
84.1	The <i>Employer</i> provides these insurances from the Insurance Table	See Annexure D to this Contract Data provided by the Employer.
84.1	The <i>Employer</i> provides these additional insurances	Refer to C1.4
84.1	The <i>Contractor</i> provides these additional insurances	Refer to C1.4
84.2	The minimum limit of indemnity for insurance in respect of loss of or damage to property (except the <i>works</i> , Plant, Materials and Equipment) and liability for bodily injury to or death of a person (not an employee of the <i>Contractor</i>) caused by activity in connection with this contract for any one event is	Whatever the <i>Contractor</i> deems necessary in addition to that provided by the <i>Employer</i>.
84.2	The minimum limit of indemnity for insurance in respect of death of or bodily injury to employees of the <i>Contractor</i> arising out of and in the course of their employment in connection with this contract for any one event is	As prescribed by the Compensation for Occupational Injuries and Diseases Act No. 130 of 1993 and the <i>Contractor's</i> common law liability for people falling outside the scope of the Act with a limit of Indemnity as per C1.4
9	Termination	There is no reference to Contract Data in this section of the core clauses and terms in italics used in this section are identified elsewhere in this Contract Data.
10	Data for main Option clause	
B	Priced contract with bill of quantities	
60.6	The <i>method of measurement</i> is	stated in Part C2.1, Pricing Assumptions.
11	Data for Option W1	
W1.1	The <i>Adjudicator</i> is (Name)	The person selected from the panel of adjudicators listed in Annexure C of this Contract Data, by the party intending to refer a dispute to him.
	Address	[•]
	Tel No.	[•]
	Fax No.	[•]

e-mail

[•]

W1.2(3)	The <i>Adjudicator nominating body</i> is:	The Chairman of the Johannesburg Society of Advocates, or his successor or his nominee.
W1.4(2)	The <i>tribunal</i> is:	Arbitration.
W1.4(5)	The <i>arbitration procedure</i> is	The latest edition of Rules for the Conduct of Arbitrations published by The Association of Arbitrators (Southern Africa) or its successor body.
	The place where arbitration is to be held is	In the city where the Site is located, within South Africa.
	The person or organisation who will choose an arbitrator	
	- if the Parties cannot agree a choice or	the Chairman for the time being or his nominee of
	- if the arbitration procedure does not state who selects an arbitrator, is	the Association of Arbitrators (Southern Africa) or its successor body.

12 Data for secondary Option clauses

X2	Changes in the law	There is no reference to Contract Data in this Option and terms in italics are identified elsewhere in this Contract Data.		
X5	Sectional Completion			
X5.1	The <i>completion date</i> for each <i>section</i> of the <i>works</i> is:	Section	Description	Completion date
		1	21L ILS installation	As per program
		2	03L ILS installation	As per program
		3	21R ILS installation	As per program
		4	03R ILS installation	As per program
X5 & X7	Sectional Completion and delay damages used together			
X7.1 X5.1	Delay damages for late Completion of the <i>sections</i> of the <i>works</i> are:	section	Description	Amount per day
		1	21L ILS installation	R2000.00
		2	03L ILS installation	R2000.00
		3	21R ILS installation	R2000.00
		4	03R ILS installation	R2000.00
	Remainder of the <i>works</i>			R2000.00
	The total delay damages payable by the <i>Contractor</i> does not exceed:	R 10000.00		
X7	Delay damages (but not if Option X5 is also used)			

X7.1	Delay damages for Completion of the whole of the <i>works</i> are	R2000.00per day up to a limit of R5000.00	
X13	Performance bond		
X13.1	The amount of the performance bond is	10%	
X15	Limitation of the <i>Contractor's</i> liability for his design to reasonable skill & care	There is no reference to Contract Data in this Option and terms in italics are identified elsewhere in this Contract Data.	
X17	Low-performance damages		
X17.1	The amounts for low-performance damages are:	Amount R 10 000 R 10 000 R 10 000 R 10 000	Performance level Initial spares package delivered, verified against the agreed Provisioning Parts List, and accepted by the <i>Project Manage</i> Technical publications/manuals (O&M, maintenance schedules) delivered and approved to 100% completeness against the agreed index Minimum of 50% of nominated technicians trained and certified competent System demonstrates 99.5% availability over an agreed demonstration period
X18	Limitation of liability		
X18.1	The <i>Contractor's</i> liability to the <i>Employer</i> for indirect or consequential loss is limited to:	Maximum limit of the insurance cover	
X18.2	For any one event, the <i>Contractor's</i> liability to the <i>Employer</i> for loss of or damage to the <i>Employer's</i> property is limited to:	Maximum limit of the insurance cover	
X18.3	The <i>Contractor's</i> liability for Defects due to his design which are not listed on the Defects Certificate is limited to	Maximum limit of the insurance cover	
X18.4	The <i>Contractor's</i> total liability to the <i>Employer</i> for all matters arising under or in connection with this contract, other than excluded matters, is limited to:	The total of the Prices other than for the additional excluded matters. The <i>Contractor's</i> total liability for the additional excluded matters is not limited. The additional excluded matters are amounts for which the <i>Contractor</i> is liable under this contract for Defects due to his design which arise before the Defects Certificate is issued,	

		Defects due to manufacture and fabrication outside the Site, loss of or damage to property (other than the works, Plant and Materials), death of or injury to a person; damage to third party property; and infringement of an intellectual property right.
X18.5	The <i>end of liability date</i> is	The date on which the liability in question prescribes in accordance with the Prescription Act No. 68 of 1969 (as amended or in terms of any replacement legislation) for any other matter.
Z	The <i>Additional conditions of contract</i> are	Z1 to Z24 below.

AMENDMENTS TO THE CORE CLAUSES

- Z1 Interpretation and the law**
- Z1.1 Add to core clause 12.3:** Any extension, concession, waiver or relaxation of any action stated in this contract by the Parties, the *Project Manager*, the *Supervisor*, or the *Adjudicator* does not constitute a waiver of rights, and does not give rise to an estoppel unless the Parties agree otherwise and confirm such agreement in writing.
- Z1.2 Add the following as a new core clause 12.5:**
- Z1.2.1** In this contract:
- Z1.2.1.1** references to any Party to the Contract include its successors or permitted assigns;
- Z1.2.1.2** references to the Contractor include the obligations of its personnel;
- Z1.2.1.3** the references to the provisions of any law include such provisions as amended, re-enacted or consolidated from time to time in so far as such amendment, re-enactment or consolidation applies or is capable of applying to any works under this Contract;
- Z1.2.1.4** references to this Contract and any deed, Contract or instrument are deemed to include references to this Contract or such other deed, agreement or instrument as amended, novated, supplemented, varied or replaced from time to time;
- Z1.2.1.5** references to a "person" include a natural person, company or any other artificial person or other corporate entity, a charity, trust, partnership, joint venture, syndicate, or any other association of persons;
- Z1.2.1.6** references to "month" means a calendar month;
- Z1.2.1.7** headings are for convenience only and are not taken into consideration in the interpretation of the Contract;
- Z1.2.1.8** where any number of days is prescribed, those days are reckoned exclusively of the first and inclusively of the last day unless the last day falls on a day that is not a working day, in which event the last day is the next succeeding working day;
- Z1.2.1.9** any provision in Contract that is or may become illegal, invalid or unenforceable in any jurisdiction is ineffective to the extent of such prohibition or unenforceability in such jurisdiction and is treated as severed from the balance of Contract in such jurisdiction, without invalidating the remaining provisions of Contract in such jurisdiction or affecting it in any other jurisdiction;

- Z1.2.1.10** references to any amount means that amount exclusive of VAT, unless the amount expressly includes VAT;
- Z1.2.1.11** the rule of construction that if general words or terms are used in association with specific words or terms that are a species of a particular genus or class, the meaning of the general words or terms shall be restricted to that same class shall not apply, and whenever the word "including" is used followed by specific examples, such examples shall not be interpreted so as to limit the meaning of any word or term to the same genus or class as the examples given;
- Z1.2.1.12** the rule of construction that the Contract is interpreted against or to the disadvantage of the party responsible for the drafting or preparation of Contract does not apply;
- Z1.2.1.13** words and abbreviations that have well known technical or trade meanings are used in the Contract in accordance with such recognized meanings;
- Z1.2.1.14** references to a "*subsidiary*" or a "*holding company*" is references to a direct or indirect subsidiary or holding company as defined in the law of the jurisdiction of the place of incorporation of the company that has a subsidiary or holding company and "*affiliate*" is any company that is under common control with such subsidiary or holding company;
- Z1.2.1.15** time is of the essence in the performance of the parties' respective obligations.
- Z2 The Project Manager and Supervisor: add the following at the end of core clause 14.2:**
- Z2.1** The Project Manager and the Supervisor may take an action which they have delegated.
- Z3 Early Warning: add the following at the end of core clause 16.2:**
- Z3.1** The Contractor ensures that a subcontractor attends risk reduction meeting if its attendance would assist in deciding the actions to be taken.
- Z4 Providing the Works: Delete core clause 20.1 and replace with the following:**
- Z4.1** The *Contractor* provides the works in accordance with the Works Information and warrants that the results of the Works, when complete, shall be fit for their intended purpose as stated in the Works Information, and if no such purposes is stated, the ordinary purpose of the Works.
- Z5 1. Subcontracting:**
- Z5.1 2. The following clause is added as a new core clause 26.4:** "Within 5 days of request by the *Project Manager*, the Contractor provides proof to the *Project Manager* that the Contractor's payment obligations towards its Subcontractors have been discharged. Failure by the Contractor to provide such proof to the satisfaction of the *Project Manager* entitles the *Employer* to instruct the *Project Manager* to certify payment directly to any such Subcontractor and the *Contractor* shall have no recourse to recover such amounts from the *Employer*. Such direct payment do not create privity of contract between the Employer and such Subcontractor. The *Employer* may recover such direct payment from the *Contractor*."
- Z6 3. Other responsibilities: add the following at the end of core clause 27:**
- Z6.1 4.** The *Contractor* has satisfied himself, prior to the Contract Date, as to the completeness, sufficiency and accuracy of all information and drawings provided to him as at the Contract Date.
- Z6.2 5.** The *Contractor* is responsible for the correct setting out of the *Works* in accordance with the original points, lines and levels stated in the *Works* Information or notified by the *Project Manager*, *Supervisor* or the *Employer*. Any errors in the positioning of the *Works* are rectified by the *Contractor* at the *Contractor's* own costs.
- 6.**
- Z7 7. Acceleration: add the following new provisions at the end of core clause 36:**

- Z7.1** 8. The Project Manager's reply is either:
- Z7.1.1** 9. A notification that the quotation is accepted, in which case, the *Project Manager* changes the Prices, Completion Date and Key Dates and accepts the revised programme; or
- Z7.1.2** 10. A notification that the quotation is not accepted and that the Prices, Completion Date and Key Dates are not changed.
- Z8** **11. Extending the defects date: add the following as a new core clause 46:**
- Z8.1** If the *Employer* cannot use the *works* due to a Defect, which arises after Completion and before the *defects date*, the *defects date* is delayed by a period equal to that during which the *Employer*, due to a Defect, is unable to use the *works*.
- Z8.2** **12.** If part of the *works* is replaced due to a Defect arising after Completion and before the *defects date*, the *defects date* for the part of the *works* which is replaced is delayed by a period equal to that between Completion and the date by when the part has been replaced.
- Z8.3** The *Project Manager* notifies the *Contractor* of the change to a *defect date* when the delay occurs. The period between Completion and an extended *defects date* does not exceed twice the period between Completion and the *defects date* stated in the Contract Data.
- Z9** **13. Quality Management System: add the following as a new core clause 47:**
- Z9.1** 14. The *Contractor* implements and maintains a quality management system with the requirements stated in the Works Information.
- Z9.2** 15. Within the period stated in the Contract Data, the *Contractor* provides the *Project Manager* with a quality plan for acceptance. A reason for not accepting the quality plan is that it does not allow for the *Contractor* to Provide the Works.
- Z9.3** **16.** If any changes are made to the quality plan, the *Contractor* provides the *Project Manager* with the changes quality plan for acceptance.
- Z9.4** 17. The *Project Manager* may instruct the *Contractor* to correct a failure to comply with the quality plan. This instruction is not a compensation event.
- Z10** **18. Assessing the amount due:**
- Z10.1** 19. **Delete the second bullet point of core clause 50.1 and replace with the following:** "within thirteen weeks of termination of this Contract"
- Z11** **20. Final assessment: add the following as a new core clause 53:**
- Z11.1** **21.** The *Project Manager* makes a final assessment and certifies final payment in accordance with the Contract. The final payment is made within four weeks of the assessment.
- Z11.2** 22. An assessment of the final amount due is conclusive evidence of the final amount due under or in connection with the Contract, unless a Party raises a dispute in relation to the assessment of the final amount due.
- Z11.3** 23. The assessment of the final amount due is changed to include any agreement the Parties reached and/or a decision of the Adjudicator which has not been referred to the tribunal within four weeks of that decision. The changed assessment becomes conclusive evidence of the final amount due under or in connection with the Contract.
- Z12** **24. Notifying compensation events:**
- Z12.1** **25. Delete the last sentence in core clause 61.3 and replace with the following:** "If the *Contractor* does not notify a compensation event within four weeks of becoming aware of the event, he is not entitled to a change in the Prices, the Completion date or a Key Date and the *Employer* is absolved

from all liability in relation to such event.”

Z13 26. Assessing compensation events:

Z13.1 27. The following is added at the end of core clause 63.4: “the *Contractor* shall only be entitled to changes to the Prices, the Completion Date and/or the Key Date if the compensation event affects the critical path.”

Z14 28. Termination

Z14.1 29. Add the following to core clause 91.1, at the second main bullet, fifth sub-bullet point, after the words “assets or”: “business rescue proceedings are initiated or steps are taken to initiate business rescue proceedings”.

AMENDMENTS TO THE SECONDARY OPTION CLAUSES

Z15 Changes in Law: Add the following clause to secondary option X2 as X2.2:

Z15.1 A change in law is defined as:

Z15.1.1 the adoption, enactment, promulgation, coming into effect, repeal, amendment, reinterpretation, change in application or other modification after the Contract Date of any law, excluding (i) the enactment of any bill inside the country, but only if such bill is enacted without any material changes being made to the contents of such bill from the form published in the Gazette (as defined in the Interpretation Act, 1957) as at the Contract Date, and (ii) any such modification in law relating to any taxes, charges, imposts, duties, levies or deductions that are assessed in relation to a person's income

Z15.1.2 any permit being terminated, withdrawn, amended, modified or replaced, other than (i) in accordance with the terms upon which it was originally granted, (ii) as a result of the failure by the *Contractor* to comply with any condition set out therein, or (iii) as a result of any act or omission of the *Contractor*, any Subcontractor or any affiliate to the *Contractor*.

Z16. Delay damages: add the following to secondary Option X7 (if applicable in this contract)

Z16.1 If the amount due for the *Contractor's* payment of delay damages reaches the limits stated in this Contract Data for Option X7, the *Employer* may, at its sole discretion, terminate the *Contractor's* obligation to Provide the Works.

Z16.2 If the *Employer* terminates in terms of this clause, the procedures and payment on termination as those applied for reasons R1 to R15 or R18 stated in the Termination Table

Z17 Performance Bond

Z17.1 Amend the first sentence of clause X13.1 to read as follows: The *Contractor* gives the *Employer* an unconditional, on-demand performance bond, provided by a bank or insurer which the *Project Manager* and the *Employer* have accepted, for the amount stated in the Contract Data and in the form set out in Annexure B of this Contract Data.

Z17.2 Add the following new clause as Option X13.2: The *Contractor ensures* that the performance bond is valid and enforceable until the end of the *contract period*. If the terms of the performance bond specify its expiry date and the end of the *contract period* does not coincide with such expiry date, four weeks prior to the said expiry date, the *Contractor* extends the validity of the performance bond until the end of the *contract period*. If the *Contractor* fails to so extend the validity of the performance bond, the *Employer* may claim the full amount of the performance bond and retain the proceeds as cash security

Z18 Limitation of liability: Insert the following new clause as Option X18.6:

Z18.1 The *Employer's* liability to the *Contractor* for the *Contractor's* indirect or consequential loss is limited to R0.00.

- Z18.2** Notwithstanding any other clause in this contract, any proceeds received from the security bonds and guarantees provided by the *Contractor* in terms of this Contract and any insurances or any proceeds which would have been received from any insurances but for the conduct of the *Contractor* shall be excluded from the calculation of the limitations of liability listed in the contract.

30. ADDITIONAL Z CLAUSES

Z19 Cession, delegation and assignment

- Z19.1** The *Contractor* shall not cede, delegate or assign any of its rights or obligations to any person without the written consent of the *Employer*, which consent shall not be unreasonably withheld. This clause shall be binding on the liquidator/business rescue practitioner /trustee (whether provisional or not) of the *Contractor*.
- Z19.2** The *Employer* may, on written notice to the *Contractor*, cede and delegate its rights and obligations under this contract to any person or entity.

Z20 Joint and several liability

- Z20.1** If the *Contractor* constitutes a joint venture, consortium or other unincorporated grouping of two or more persons, these persons are deemed to be jointly and severally liable to the *Employer* for the performance of the Contract.
- Z20.2** The *Contractor* shall, within 1 week of the Contract Date, notify the *Project Manager* and the *Employer* of the key person who has the authority to bind the *Contractor* on their behalf.
- Z20.3** The *Contractor* does not materially alter the composition of the joint venture, consortium or other unincorporated grouping of two or more persons without prior written consent of the *Employer*.

Z21 Ethics

- Z21.1** The *Contractor* undertakes:
- Z21.1.1** not to give any offer, payment, consideration, or benefit of any kind, which constitutes or could be construed as an illegal or corrupt practice, either directly or indirectly, as an inducement or reward for the award or in execution of this contract;
- Z21.1.2** to comply with all laws, regulations or policies relating to the prevention and combating of bribery, corruption and money laundering to which it or the *Employer* is subject, including but not limited to the Prevention and Combating of Corrupt Activities Act, 12 of 2004.
- Z21.2** The *Contractor's* breach of this clause constitutes grounds for terminating the *Contractor's* obligation to Provide the Works or taking any other action as appropriate against the *Contractor* (including civil or criminal action). However, lawful inducements and rewards shall not constitute grounds for termination.
- Z21.3** If the *Contractor* is found guilty by a competent court, administrative or regulatory body of participating in illegal or corrupt practices, including but not limited to the making of offers (directly or indirectly), payments, gifts, gratuity, commission or benefits of any kind, which are in any way whatsoever in connection with the contract with the *Employer*, the *Employer* shall be entitled to terminate the contract in accordance with the procedures stated in core clause 92.2. The amount due on termination is A1.

Z22 Confidentiality

- Z22.1** All information obtained in terms of this contract or arising from the implementation of this contract shall be treated as confidential by the *Contractor* and shall not be used or divulged or published to any person not being a party to this contract, without the prior written consent of the *Project Manager* or the *Employer*, which consent shall not be unreasonably withheld.
- Z22.2** If the *Contractor* is uncertain about whether any such information is confidential, it is to be regarded as such until otherwise notified by the *Project Manager*.

Z22.3 This undertaking shall not apply to –

Z22.3.1 Information disclosed to the employees of the *Contractor* for the purposes of the implementation of this agreement. The *Contractor* undertakes to procure that its employees are aware of the confidential nature of the information so disclosed and that they comply with the provisions of this clause;

Z22.3.2 Information which the *Contractor* is required by law to disclose, provided that the *Contractor* notifies the *Employer* prior to disclosure so as to enable the *Employer* to take the appropriate action to protect such information. The *Contractor* may disclose such information only to the extent required by law and shall use reasonable efforts to obtain assurances that confidential treatment will be afforded to the information so disclosed;

Z22.3.3 Information which at the time of disclosure or thereafter, without default on the part of the *Contractor*, enters the public domain or to information which was already in the possession of the *Contractor* at the time of disclosure (evidenced by written records in existence at that time);

Z22.4 The taking of images (whether photographs, video footage or otherwise) of the *works* or any portion thereof, in the course of Providing the Works and after Completion, requires the prior written consent of the *Project Manager*. All rights in and to all such images vests exclusively in the *Employer*.

Z22.5 The *Contractor* ensures that all his Subcontractors abide by the undertakings in this clause.

Z23 Liens and Encumbrances

Z23.1 The *Contractor* keeps the Equipment used to Provide the Services free of all liens and other encumbrances at all times. The *Contractor*, vis-a-vis the *Employer*, waives all and any liens which he may from time to time have, or become entitled to over such Equipment and any part thereof and procures that his Subcontractors similarly, vis-a-vis the *Employer*, waive all liens they may have or become entitled to over such Equipment from time to time

Z24 Intellectual Property

Z24.1 Intellectual Property (“IP”) rights means all rights in and to any patent, design, copyright, trade mark, trade name, trade secret or other intellectual or industrial property right relating to the Works.

Z24.2 IP rights remain vested in the originator and shall not be used for any reason whatsoever other than carrying out the *works*.

Z24.3 The *Contractor* gives the *Employer* an irrevocable, transferrable, non-exclusive, royalty free licence to use and copy all IP related to the *works* for the purposes of constructing, repairing, demolishing, operating and maintaining the works.

Z24.4 The written approval of the *Contractor* is to be obtained before the *Contractor's* IP made available to any third party which approval will not be unreasonably withheld or delayed. Prior to making any *Contractor's* IP available to any third party the *Employer* shall obtain a written confidentiality undertaking from any such third party on terms no less onerous than the terms the *Employer* would use to protect its IP.

Z24.5 The *Contractor* shall indemnify and hold the *Employer* harmless against and from any claim alleging an infringement of IP rights (“**the claim**”), which arises out of or in relation to:

Z24.5.1 the *Contractor's* design, manufacture, construction or execution of the Works;

Z24.5.2 the use of the *Contractor's* Equipment, or

Z24.5.3 the proper use of the Works.

Z24.6 The *Employer* shall, at the request and cost of the *Contractor*, assist in contesting the claim and the *Contractor* may (at its cost) conduct negotiations for the settlement of the claim, and any litigation or arbitration which may arise from it.

PART C1.3 INSURANCE

INSURANCE CLAUSES FOR CAPEX PROJECTS

Summary of Terms and other Matters Applicable to Employer Provided Insurance

INSURANCE CLAUSES FOR CAPEX PROJECTS

The insurance clauses in this document should be extracted and attached to tender documents and to contracts.

SECTION A: DEFINITIONS

Landside refers to:

Areas of the airport before the security points; and

The restricted area beyond the security points but, within the perimeter of gatehouses, passenger terminals and cargo buildings.

Airside refers to:

The Apron / manoeuvring areas; and

Area within the airside boundary/perimeter fence, excluding the internal areas of the passenger terminals, perimeter gatehouses and cargo buildings.

SECTION B: INSURANCE CLAUSES

The successful bidder must source the following insurance cover, which is the deductible in the ACSA insurance cover:

- **Aviation liability insurance cover for an indemnity limit not less than R300 000 (three hundred thousand rands).**
- **Submit proof of insurance to ACSA before the work starts, and annually for the duration of the project.**

C1.4: OCCUPATIONAL HEALTH AND SAFETY AGREEMENT**OCCUPATIONAL HEALTH AND SAFETY AGREEMENT**

AGREEMENT IN TERMS OF SECTION 37(2) OF THE OCCUPATIONAL HEALTH & SAFETY ACT (ACT 85 Of 1993) & CONSTRUCTION REGULATION 5.1(k)

OBJECTIVES

To assist Airport Company South Africa (ACSA) in order to comply with the requirements of:

1. The Occupational Health & Safety (Act 85 of 1993) and its regulations and
2. The Compensation for Occupational Injuries & Diseases Act (Act 130 of 1993) also known as the (COID Act).

To this end an Agreement must be concluded before any contractor/ subcontracted work may commence

The parties to this Agreement are:

Name of Organisation: AIRPORTS COMPANY SOUTH AFRICA O.R.TAMBO INTERNATIONAL AIRPORT
Physical Address: Airports Company South Africa SOC Limited O.R.TAMBO International Airport Administration Office Southern Office Block Western Cape South Africa 7525

Hereinafter referred to as “Client”

Name of organisation:
Physical Address:

Hereinafter referred to as “the Mandatary/ Principal Contractor”

MANDATORY'S MAIN SCOPE OF WORK**GENERAL INFORMATION FORMING PART OF THIS AGREEMENT**

1. The Occupational Health & Safety Act comprises of SECTION 1-50 and all unrepealed REGULATIONS promulgated in terms of the former Machinery and Occupational Safety Act No.6 of 1983 as amended as well as other REGULATIONS which may be promulgated in terms of the Act and other relevant Acts pertaining to the job in hand.
2. "Mandatory" is defined as including as agent, a principal contractor or a contractor for work, but WITHOUT DEROGATING FROM HIS/HER STATUS IN HIS/HER RIGHT AS AN EMPLOYER or user of the plant
3. Section 37 of the Occupational Health & Safety Act potentially punishes Employers (PRINCIPAL CONTRACTOR) for unlawful acts or omissions of Mandatories (CONTRACTORS) save where a Written Agreement between the parties has been concluded containing arrangements and procedures to ensure compliance with the said Act BY THE MANDATARY.
4. All documents attached or refer to in the above Agreement form an integral part of the Agreement.
5. To perform in terms of this agreement Mandatories must be familiar and conversant with the relevant provisions of the Occupational Health & Safety Act 85 of 1993 (OHS Act) and applicable Regulations.
6. Mandatories who utilise the services of their own Mandatories (contractors) must conclude a similar Written Agreement with them.
7. Be advised that this Agreement places the onus on the Mandatory to contact the CLIENT in the event of inability to perform as per this Agreement.
8. This Agreement shall be binding for all work the Mandatory undertakes for the client.
9. All documentation according to the Safety checklist including a copy of the written Construction Manager appointment in terms of construction regulation 8, must be submitted 7 days before work commences.

THE UNDERTAKING

The Mandatory undertakes to comply with:

INSURANCE

1. The Mandatory warrants that all their employees and/or their contractor's employees if any are covered in terms of the COID Act, which shall remain in force whilst any such employees are present on the Client's premises. A letter is required prior commencing any work on site confirming that the Principal contractor or contractor is in good standing with the Compensation Fund or Licensed Insurer.
2. The Mandatory warrants that they are in possession of the following insurance cover, which cover shall remain in force whilst they and /or their employees are present on the Client's premises, or which shall remain in force for that duration of their contractual relationship with the Client, whichever period is the longest.
 - a. Public Liability Insurance Cover as required by the Subcontract Agreement.
 - b. Any other Insurance cover that will adequately makes provision for any possible losses and/or claims arising from their and /or their Subcontractors and/or their respective employee's acts and/or omissions on the Client's premises.

**COMPLIANCE WITH THE OCCUPATIONAL HEALTH & SAFETY
ACT 85 OF 1993**

The Mandatary undertakes to ensure that they and/or their subcontractors if any and/or their respective employees will at all times comply with the following conditions:

1. All work performed by the Mandatary on the Client's premises must be performed under the close supervision of the Mandatary's employees who are to be trained to understand the hazards associated with any work that the Mandatary performs on the Client's premises.
2. The Mandatary shall be assigned the responsibility in terms of Section 16(1) of the OHSAct 85 of 1993, if the Mandatary assigns any duty in terms of Section 16(2), a copy of such written assignment shall immediately be forwarded to the Client.
3. The Mandatary shall ensure that he/she familiarise himself/herself with the requirements of the OHSAct 85 of 1993 and that s/he and his/her employees and any of his subcontractors comply with the requirements.
4. The Mandatary shall ensure that a baseline risk assessment is performed by a competent person before commencement of any work in the Client's premises. A baseline risk assessment document will include identification of hazards and risk, analysis and evaluation of the risks and hazards identified, a documented plan and safe work procedures to mitigate, reduce or control the risks identified, and a monitoring and review plan of the risks and hazards.
5. The Mandatary shall appoint competent persons who shall be trained on any Occupational Health & Safety aspect pertaining to them or to the work that is to be performed.
6. The Mandatary shall ensure that discipline regarding Occupational Health & Safety shall be strictly enforced.
7. Any personal protective equipment required shall be issued by the Mandatary to his/her employees and shall be worn at all times.
8. Written safe working practices/procedures and precautionary measures shall be made available and enforced and all employees shall be made conversant with the contents of these practises.
9. No unsafe equipment/machinery and/or articles shall be used by the Mandatary or contractor on the Client's premises.
10. All incidents/accidents referred to in OHSAct shall be reported by the Mandatary to the Provincial Director: Department of Labour as well as to the Client.
11. No user shall be made by the Mandatary and/or their employees and or their subcontractors of any of the Client's machinery/article/substance/plant/personal protective equipment without prior written approval.
12. The Mandatary shall ensure that work for which the issuing of permit is required shall not be performed prior to the obtaining of a duty completed approved permit.
13. The Mandatary shall ensure that no alcohol or any other intoxicating substance shall be allowed on the Client's premises. Anyone suspected to be under the influence of alcohol or any other intoxicating substance shall not be allowed on the premises. Anyone found on the premises suspected to be under the influence of alcohol or any other intoxicating substance shall be escorted off the said premises immediately.
14. Full participation by the Mandatary shall be given to the employees of the Client if and when they inquire into Occupational Health & Safety.

FURTHER UNDERTAKING

1. Only a duly authorised representative appointed in terms of Section 16.2 of the OHS Act is eligible to sign this agreement on behalf of the Mandatary. The signing power of this representative must be designated in writing by the Chief Executive Officer of the Mandatary. A copy of this letter must be made available to the Client.
2. The Mandatary confirms that he has been informed that he must report to the Client's management, in writing anything he/she deems to be unhealthy and /or unsafe. He has versed his employees in this regard.
3. The Mandatary warrants that he/she shall not endanger the health & safety of the Client's employees and other persons in any way whilst performing work on the Client's premises.

4. The Mandatary understands that no work may commence on the Client's premises until this procedure is duly completed, signed and received by the Client.
5. Non-compliance with any of the above clauses may lead to an immediate cancellation of the contract.

ACCEPTANCE BY MANDATARY

In terms of section 37(2) of the Occupational Health & Safety Act 85 of 1993 and section 5.1(k) of the Construction Regulations 2014,

Ia duly authorised 16.2 Appointee acting for and on behalf of(company name) undertake to ensure that the requirements and the provision of the OHSAct 85 of 1993 and its regulations are complied with.

Mandatary – WCA/ Federated Employers Mutual No.....

Expiry date

SIGNATURE ON BEHALF OF MANDATARY
(Warrant his authority to sign)

DATE

SIGNATURE ON BEHALF OF THE CLIENT
AIRPORT COMPANY SOUTH AFRICA

DATE

C2 Pricing Data

C2.1 Pricing assumptions

The *conditions of contract*

How work is priced and assessed for payment

Clause 11 in NEC3 Engineering and Construction Contract, April 2013 (ECC3) Option B states:

Identified and defined terms	11 11.2	(21) The Bill of Quantities is the <i>bill of quantities</i> as changed in accordance with this contract to accommodate implemented compensation events and for accepted quotations for acceleration.
		(22) Defined Cost is the cost of the components in the Shorter Schedule of Cost Components whether work is subcontracted or not excluding the cost of preparing quotations for compensation events.
		(28) The Price for Work Done to Date is the total of the quantity of the work which the <i>Contractor</i> has completed for each item in the Bill of Quantities multiplied by the rate and a proportion of each lump sum which is the proportion of the work covered by the item which the <i>Contractor</i> has completed. Completed work is work without Defects which would either delay or be covered by immediately following work.
		(31) The Prices are the lump sums and the amounts obtained by multiplying the rates by the quantities for the items in the Bill of Quantities.

This confirms that Option B is a re-measurement contract and the bill comprises only items measured using quantities and rates or stated as lump sums. The Contractor is paid based on the actual quantities of work performed as opposed to the quantities set out in the Bill of Quantities. Value related items are not used. Time related items are items measured using rates where the rate is a unit of time. With this pricing method, the Contractor bears the risk for his pricing of the bill and the Employer bears the risk for changes in the quantities.

Function of the Bill of Quantities

Clause 55.1 in Option B states, "Information in the Bill of Quantities is not Works Information or Site Information". This confirms that instructions to do work or how it is to be done are not included in the Bill, but in the Works Information. This is further confirmed by Clause 20.1 which states, "The *Contractor* Provides the Works in accordance with the Works Information". Hence the *Contractor* does not Provide the Works in accordance with the Bill of Quantities. The Bill of Quantities is only a pricing document.

Guidance before pricing and measuring

Employers preparing tenders or contract documents, and tendering contractors are advised to consult the sections dealing with the bill of quantities in the NEC3 Engineering and Construction Contract (April 2013) the requirements of the tender (if any) and the Guidance Notes before preparing the *bill of quantities* or before entering rates and lump sums into the *bill*.

The NEC approach to the P & G bill assumes use will be made of method related charges for Equipment applied to Providing the Works based on durations shown in the Accepted Programme, fixed charges for the use of Equipment that is required throughout the construction phase, time related charges for people working in a supervisory capacity for the period required, and lump sum charges for other facilities or services not directly related to performing work items typically included in other parts of the bill.

The P & G section of the bill is not used for the assessment of compensation events.

Measurement and payment

Symbols

The units of measurement described in the Bill of Quantities are metric units abbreviated as follows:

Abbreviation	Unit
%	percent
h	hour
ha	hectare
kg	kilogram
kl	kilolitre
km	kilometre
km-pass	kilometre-pass
kPa	kilopascal
kW	kilowatt
l	litre
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 ¹	provisional sum
PC-sum	prime cost sum
R/only	Rate only
sum	Lump sum
t	ton (1000kg)
W/day	Work day

General assumptions

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

The Prices and rates stated for each item in the Bill of Quantities shall be treated as being fully inclusive of all work, risks, liabilities, obligations, overheads, profit and everything necessary as incurred or required by the *Contractor* in carrying out or providing that item.

An item against which no Price is entered will be treated as covered by other Prices or rates in the *bill of quantities*.

¹ Provisional Sums should not be used unless absolutely unavoidable. Rather include specifications and associated bill items for the most likely scope of work, and then change later using the compensation event procedure if necessary.

The quantities contained in the Bill of Quantities may not be final and do not necessarily represent the actual amount of work to be done. The quantities of work assessed and certified for payment by the *Project Manager* at each assessment date will be used for determining payments due.

The short descriptions of the items of payment given in the *bill of quantities* are only for the purposes of identifying the items. Detail regarding the extent of the work entailed under each item is provided in the Works Information.

Departures from the *method of measurement*

Amplification of or assumptions about measurement items

For the avoidance of doubt the following is provided to assist in the interpretation of descriptions given in the *method of measurement*. In the event of any ambiguity or inconsistency between the statements in the *method of measurement* and this section, the interpretation given in this section shall be used.

PRICING INSTRUCTIONS

- **Strict ZAR Currency Requirement:** All rates and lump-sum prices entered in this Bill of Quantities must be quoted strictly in South African Rands (ZAR). Bids submitted in any foreign currency will be disqualified automatically.
- **All-Inclusive Fixed Rates:** Rates entered by the bidder must be inclusive of all costs, including but not limited to customs duties, forward cover costs, import taxes, and foreign exchange variances.
- **Firm and Non-Adjustable Pricing:** Quantities and rates are fixed for the duration of the contract. No claims for price adjustments, escalations, or variations due to foreign exchange rate fluctuations will be entertained by the Employer.
- **Risk Absorption Confirmation:** By signing and submitting this BOQ, the bidder explicitly confirms that they have factored all foreign currency exposure and exchange rate volatility into their unit rates.
- **The cost of securing forward cover or any other financial hedging instruments to mitigate exchange rate volatility must be factored into the bidder's unit rates or Preliminaries; no separate payment item will be provided for this purpose.**

C2.2 Price List

The Price List is as follows

Price List No1: Preliminary and General (once-off)

No.	Description	UOM	Qty	TOTAL AMOUNT FOR CONTRACT PERIOD
1.1	Provisional Sum for all permits and training	sum	1	R50 000,00
1.2	Safety File Upon Tender Award	sum	1	R
1.3	Site establishment and removal and make good on the grass and surroundings. Site establishment will include connection of the services water and electricity.	sum	1	R
1.4	Decommissioning, Removal of the current ILS system (Localisers, Glide Slopes and DME) and transportation to ACSA storage within the airport airside.	sum	1	R
1.5	Drawings and Manuals (in English): - Localiser & Glide Path Instruction Manual and - Localiser & Glide Path Technical Handbooks, - DME Instruction Manual and - DME Technical Handbooks (Provide 4 x Hard copies and soft copies of the above listed drawings and manuals)	sum	1	R
1.6	Municipality Approvals for erection of fixed structure where the current structure location is changed (where applicable)	Each	4	R
1.7	Extended Equipment Warranty - Additional 1 year warranty after standard warranty has lapsed (for all equipment)	sum	1	R
1.8	Insurance premiums (As per C1.4)	Per month	36	R
	TOTAL FOR PRICE LIST 1 Excluding VAT			

Price List No2: ILS Supply and Installation of Material and Equipment

No	DESCRIPTION	UOM	QTY	UNIT SELLING	TOTAL PRICE
2.1	<u>EQUIPMENT- 03R, 03R, 21R & 21L ILS Localizer Systems – CAT III C</u>				
2.1.1	Supply, delivery, install and commission Two-Frequency Dual Transmitter Localizer (CATIII C) as described in Scope (Annexure A) of Supply combined with all accessories. Including localiser antenna system with frangible masts				
2.1.1.1	Supply	each	4	R	R
2.1.1.2	Install	each	4	R	R
2.1.2	Supply, delivery, install and commission Localizer antenna system combined with all accessories with interface to RCMS and Far Field and Near Field monitor antenna system (frangible)				
2.1.2.1	Supply	each	4	R	R
2.1.2.2	Install	each	4	R	R
2.2	<u>EQUIPMENT- 03R, 03R, 21R & 21L ILS Glide Path Systems – CAT III C</u>				
2.2.1	Supply, delivery, install and commission Glide Path System Two-Frequency Dual Transmitter Glide Path with Hot standby monitoring (CAT III C), as described in Scope of Supply combined with all accessories.				
2.2.1.1	Supply	each	4	R	R
2.2.1.2	Install	each	4	R	R
2.2.2	Supply, delivery, install and commission M-Array Glide Path Antenna System or equivalent, as described in Scope of Supply combined with all accessories, including a Glide Path Antenna and a mast.				
2.2.2.1	Supply	each	4	R	R
2.2.2.2	Install	each	4	R	R
2.2.3	Existing Glide Path 03R Screen needs to be replaced with a new permanent screen and Glide Path Antenna System needs to design to eliminate the scalloping effect of terrain obstacles.				
2.2.3.1	Supply	each	1	R	R
2.2.3.2	Install	each	1	R	R
2.3	<u>EQUIPMENT- 03R, 03R, 21R & 21L DME Equipment</u>				
	Supply, delivery, install and commission DME and directional DME antenna complete as described in the scope of Supply combined with all accessories.				
2.3.1	Supply	each	4	R	R
2.3.2	Install	each	4	R	R
2.4	<u>ACCESSORIES FOR REMOTE CONTROL & REMOTE MAINTENANCE MONITORING (RMM)</u>				
2.4.1	Chassis for Remote Control Units as described in Scope of Supply complete with all accessories.				
2.4.1.1	Supply	each	4	R	R
2.4.1.2	Install	each	4	R	R
2.4.2	Remote maintenance & Monitoring (RMM) Workstation as described in Scope of Supply, including:				
2.4.3	RMM Software	each	4	R	R
2.4.4	Desktop computer with serial port to connect to ILS	each	4	R	R
2.4.5	Personal Laptop computer with serial port to connect to ILS	each	2	R	R
2.4.6	ILS Changer Over control Units as described in Scope of Supply combined with all accessories.				
2.4.6.1	Supply	each	4	R	R
2.4.6.2	Install	each	4	R	R

2.5	<u>Spare Parts & Test Accessories Spare Parts for ILS</u>				
2.5.1	Depot Spares Kit for LLZ/GP, CAT III				
2.5.1.1	Set of spare Modules for Localizer and Glide Path, containing one of each type of plug-in module in the system, as described in the scope of supply. (for all ILSs)	each	2	R	R
2.5.1.2	Supply Spare Transmitter Module for Localizer,	each	2	R	R
2.5.1.3	Spare Monitor Module for Localiser,	each	2	R	R
2.5.1.4	Spare Transmitter Module for Glide Path.	each	2	R	R
2.5.1.5	Spare Monitor Module for Glide Path.	each	2	R	R
2.5.1.6	Power supply unit	each	2	R	R
2.5.1.7	Remote Monitoring and Maintenance Workstation	each	2	R	R
2.5.1.8	Power Amplifier/Modulator - Localiser	each	2	R	R
2.5.1.9	Power Amplifier or Modulator- Glidepath	each	2	R	R
2.5.1.10	Signal Monitoring of the aerial and standby transmitter monitoring kit/module - Localiser	each	2	R	R
2.5.1.11	Signal Monitoring of the aerial and standby transmitter monitoring kit or module – Glide Path.	each	2	R	R
2.5.2	Accessories for ILS				
2.5.2.1	Installation Material for LLZ, GP, DME and Tower	Sum	1		
2.5.2.2	Lightning Protection and Earthing Systems as described in the scope of supply c/w all accessories. (C3.1&C3.2)	Sum	1		
2.5.2.3	Obstruction lights as described in the scope of supply c/w all accessories (including all the buildings, antennas and glide path screen). (C3.1&C3.2)	each	32		
2.5.3	Spare Parts for DME				
2.5.3.1	Site Spares kit for DME Low Power, as specified in the Scope of Supply c/w all accessories.	Sum	1		
2.6	<u>Special Test Equipment</u>				
2.6.1	NAV Analyzer of ILS Localizer, Glide Path, VOR and including ILS checker software with integrated GPS, as described in the Scope of Supply c/w all accessories. (C3.1&C3.2)	Sum			
2.7	<u>Instruction Manuals and Drawings</u>				
2.7.1	Soft copy- Instruction Manual and Technical Handbooks in English (ILS)	sum	1		
2.7.2	Hard Copy - Technical Manual ILS, DME,RCMS and Fibre interface.	each	4		
2.7.3	Provision of as build drawings	sum	1		
TOTAL FOR PRICE LIST 2 Excluding VAT					

Price List No 3: **INSTALLATION**

No	DESCRIPTION	UOM	QTY	UNIT SELLING	TOTAL PRICE
3.1	<u>Civil Works & Fibre Optic Cabling (FO)</u>				
3.1.1	Civil Works including site preparation, concrete foundations for Glidepath Antennae, Localiser, FFM, DME antennas, Crane Hire etc (C3.1&C3.2) Civil Works including site preparation, concrete foundations for Shelters, Glidepath Antennae, Localizer Antennae, datum etc	each	4		
3.1.2	Crane hire, height access equipment hire, rigging equipment hire and any Equipment Hire etc.	Sum	1		
3.1.3	Supply, deliver and install (splicing) 24 port fast switching redundancy network switches with associated serial to single mode fibre convertors and termination cabinets. Supply and installation into existing ducting of 10kms Heavy Duty 24-core Single Mode FO cable. terminated in patch panels at all 8 ILS sites, SAWS office and the ATNS equipment room. See attached drawing in Annex F (C3.1&C3.2)	Sum	1		
3.2	<u>Training</u>				
3.2.1	Practical ILS Training (On-Site) for ATNS and ACSA including system setup and commissioning training. See details under (C3.1&C3.2)	Sum	1		
3.3	<u>Site Survey</u>				
3.3.1	Site Survey & Analysis for all sites and ILSs- Site Assessment, Site Survey and Terrain Determination, SACAA obstacles and/ or AMOC Approvals	sum	1		
3.3.2	03L Glide Path position Assessment and Relocation See details in (C3.1&C3.2) and annexes	sum	1		
3.4	<u>Equipment room electrical upgrades</u>				
3.4.1	Supply, deliver and install the 12000 BTU Air conditioner high reliable units. 10 Year warranty as per scope.	Each	8		
3.4.2	Supply, deliver and install 70sqm XLPE 4 core electrical cable, joint and termination as per scope.	Metres	800		
3.4.3	Supply, deliver and install metal Wall mounted Distribution Board – 18-way 100 A rated, as per scope	Each	8		

3.4.4	Supply, deliver and lay the 110mm steel cable conduits between individual ILS sites and antennas (re-measurable)	Metres	2000		
3.4.5	Supply, deliver and lay the 110mm steel cable conduits between individual ILS sites and antennas (re-measurable)	Metres	1000		
3.4.6	Removal and disposal the old container housings.	Each	2		
3.4.7	Supply, deliver and install LED above the equipment shelter entrance doors IP65 Waterproof: LED Outdoor Wall Light IP65 waterproof, weatherproof, and rust proof, Warranty 3 years as per scope	Each	8		
3.4.8	Supply, deliver and install 40W 600mm x 600mm surface mount ceiling LED fixture, Warranty: 5 Years as per scope.	Each	8		
3.4.9	Supply, deliver and install 5kVA Inverter including accessories.	Each	8		
3.4.10	Supply, deliver and install Lithium Battery pack backup up to 4 x hours per ILS system	Each	8		
3.4.11	Earthing and lightning protection assessment and installation	Each	8		
3.4.12	Fire Detection Assessment and installation	Each	8		
3.4.13	03R Localiser Building Structural Assessment and wall crack repair	Sum	1		
3.4.14	Termites' removal	Sum	1		
3.5	<u>03L & 21R shelter replacement</u>				
3.5.1	See details in (C3.1&C3.2) and annexes	Sum	1		
3.5.2	Step-up transformer 25kVA 1000/400V	Each	2		
3.5.3	Step-down transformer 25kVA 1000/400V	Each	2		
3.5.4	Step-up transformer 15kVA 230/1000V	Each	2		
3.6	Bird Proofing (4 x Localiser Antenna)	Sum	1		
TOTAL FOR PRICE LIST 3 Excluding VAT					

Price List No 4: **PROJECT MANAGEMENT**

No	DESCRIPTION	UOM	QTY	UNIT SELLING	TOTAL PRICE
4.1	Services				
4.1.1	Factory Acceptance Test for all ILSs. Customer participation in Factory Acceptance Testing as described in the Scope of Supply. (All travel arrangements to be pre-approved by the ACSA Contract Manager)	sum	1	R500 000.00	R500 000.00
4.2	Commissioning				
4.2.1	Commissioning services by approved Engineer for the offered equipment, including system run-up and ground tests for all ILSs	Sum	1		
4.3	Flight Check Assistance				
	Attendance by OEM approved Engineer during the Flight Checks for all ILSs. Estimated on 10 Hours per ILS.	Sum	1		
4.4	Flight Calibration				
4.4.1	Flight Calibration Aircraft for all ILSs Flight Calibration by SACAA . Estimated on 10 Hours of flying time per ILS calibration Provisional Sum (claim on proven cost)	sum	1	R850 000,00	R850 000,00
4.5	<u>Project Management</u>				
	Management Fees	Sum	1		
TOTAL FOR PRICE LIST 4 Excluding VAT					

TOTAL PRICE SUMMARY

DESCRIPTION	TOTAL (EXCLUDING VAT)
Total Price List No1 - Preliminary and General	R
Total Price List No2 - ILS Supply and Installation of Material and Equipment	R
Total Price List No3 - Installation	R
Total Price List No4 - Project Management	R
SUB – TOTAL EXCLUDING VAT	R
CONTINGENCY @ 10% (10% of subtotal)	R
*GRAND TOTAL EXCLUDING VAT	R
*VAT	R
*GRAND TOTAL INCLUDING VAT	R

**Transfer these amounts to the Form of Offer and Acceptance (section C1.1)*

PART 3: SCOPE OF WORK

Document reference	Title	No of pages
	This cover page	1
C3.1	<i>Employer's Works Information</i>	17
C3.2	<i>Contractor's Works Information</i>	1
	Total number of pages	19

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3.1.1 Description of the works

3.1.1.1 Executive overview

The project comprises the following:

Upgrading, supply, install, test, commission, and flight calibration of ILS equipment for 03R, 21L, 03L, and 21R ILS.

The ILS system as a navigational aid is required by ICAO Annex10 and SACAA CATS 139 for safety and guidance of aircraft during bad weather conditions and low visibility operations.

Since February 2014 scalloping was introduced to the glide path signal for 03R ILS. The interference started causing disengagement of the auto pilot functionality to some aircraft. It was later discovered that a building constructed within the obstacle limitation surface, was interfering with the emitted glide path signals. The 03R localiser signal is also susceptible to similar scalloping phenomena around the 03R/21L intersection with taxiway Echo; and this is caused by a hangar in the vicinity.

During the 2015 financial year the 03R localiser antenna was upgraded to a 20-element type to reduce scalloping to about 5 micro-Amps, which is within CAT2 limits. The electronic components of the localizer were however not upgraded.

The Instrument Landing Systems currently installed at O.R. Tambo International Airport is a Category II, it provides precise electronic guidance to properly equipped aircraft that are making approaches to and landings on airport runways where the ILS is installed.

The ILS consists of:

- Localizer electronic system and localizer antenna subsystems
- Glide slope electronic system and glide slope antenna subsystems
- Distance Indication Equipment - DME subsystems not described in this specification.
- Localizer far field monitoring equipment.
- Localizer and glide path near field monitoring.
- Remote control status unit (RCSU) and Interface to the DAID (Digital Airfield Information Display) system and ACSA runway selection system for the runway interlock.

The scope includes:

- Geographical and positioning survey study to cater for terrain variation.
- Software simulation to determine the best possible ILS antenna system for the specific terrain.
- Design and selection of the most suitable CAT III C ILS at RWY 03R, 21L, 03L, and 21R.
- RF cables, Electrical KIOSK replacements, Fibre network replacements and end-user equipment.
- Provision for dual system air-conditioning split unit and connected c/w accessories and ACCU (Air Condition Control Unit).
- SACAA application or notification of the obstruction within the aerodrome
- Obstacles height lowering and clearance.
- Painting of the obstruction mast as per ICAO annexure 14 for mast, frangibility requirement for near field antenna within 900m of the landing approach lights.

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- Provision of the eight hours battery or inverter technology using latest lithium batteries for all the ILS system shelters.
- Decommissioning of the current CAT II ILS system RWY 03R, 21L, 03L, 21R.
- Supply and delivery of the new CAT III C ILS system for RWY 03R, 21L, 03L, 21R.
- Installation of the new CAT III C ILS system for RWY 03R, 21L, 03L, 21R.
- Interface of the new ILS system with ATNS DAID, ACSA Runway selection system and other peripheral systems
- Conduct CAT III C Flight commissioning to be done on the entire ILS system including the system SAT (Site Acceptance Test) and Ground checks.
- The ILS system must include all computers and servers to be installed at the ILS sites and the ATNS Equipment room.
- Provide a software assurance with a highest-level determination.
- Fibre network communication redundancy, ring feed topology. Scope part of the Navigational Aid Fibre Project at ORTIA but integration and interconnections will be part of this project.
- Identification and marking of the Localiser Sensitive Area (LSA) and ILS Critical Area to minimise the interference with CAT II system.
- Clear installation methodology taking into consideration that one runway ILS should be decommissioned and commissioned before the other runway ILS is installed. One runway ILS system to be installed at the time and accepted before the next runway ILS is installed. The plan is to start 03R as it has reached its design life, then replace 03L, 21R and complete with 21L. The decommissioning and commissioning should be time with the flight calibration interval and the AIRAC cycle.
- Survey and engineering assessment of Relocation of 03L Glide Path to the other side of the runway due to interference by aircraft when queuing for departure (Annex G).
- ILS 03L and 21R Shelter complete replacement with new shelter and assessment of power supply and concrete floor.
- Fibre Optic Management System with interface to each ILS, SAWS and RCMS at ATNS Operational centre.
- Training OEM training, OJTI, installation and commissioning training.

3.1.1.2 Employer's objectives and purpose of the works

The Employer's objective and purpose is to upgrade the 03R, 21L, 03L, and 21R instrument landing system for compliance with Annex 14 of ICAO's (International Civil Aviation Organisation) international standard recommended practices.

3.1.1.3 Interpretation and terminology

The following abbreviations are used in this Works Information:

Abbreviation	Meaning given to the abbreviation
ACSA	Airport Company South Africa
ACCU	Air-Condition Control Unit
AVOP	Airside Vehicle Operating Procedure
CAT	Category
CATS	Civil Aviation Technical Standards
CTU	Control Tower Unit
DME	Distance Measuring Equipment
IEC	International Electrotechnical Commission
ILS	Instrument Landing System
LV	Low Voltage
ORTIA	Oliver Regional Tambo International Airport
RCSU	Remote control status unit
SACAA	South African Civil Aviation Authority
SOC	State Owned Company
VAT	Value Added Tax
V	Volt

3.1.2 Management and start up.

3.1.2.1 Management meetings

Regular meetings of a general nature may be convened and chaired by the *Project Manager* as follows:

Title and purpose	Approximate time & interval	Location	Attendance by:
-------------------	-----------------------------	----------	----------------

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Risk register and compensation events	Weekly	ORTIA	
Overall contract progress and feedback	Monthly	ORTIA	<i>Employer, Contractor, Supervisor,</i>

Meetings of a specialist nature may be convened as specified elsewhere in this Works Information or if not so specified by persons and at times and locations to suit the Parties, the nature and the progress of the *works*. Records of these meetings shall be submitted to the *Project Manager* by the person convening the meeting within five days of the meeting.

All meetings shall be recorded using minutes or a register prepared and circulated by the person who convened the meeting. Such minutes or register shall not be used for the purpose of confirming actions or instructions under the contract as these shall be done separately by the person identified in the *conditions of contract* to carry out such actions or instructions.

3.1.2.2 Documentation control

All correspondence between the Contractor, Consultant and the Employer shall be performed in an organized manner as defined below.

In this context, by correspondence is meant:

- a) Letters
- b) Telefaxes
- c) E-mail

All correspondence originating from a sub-contractor shall first be dealt with and coordinated by the Contractor and submitted as the contractor's correspondence.

For the purposes of distribution and archiving, a correspondence of any type shall not deal with a mixture of various subjects. This refers to both technical and commercial items, i.e. where practical, each technical and commercial subject shall be dealt with in separate correspondence.

All correspondence shall bear the Project Title and the Contract Number.

Furthermore, all correspondence shall bear the date of issuance, in DD.MM. YYYY format.

a) **LETTERS**

For official correspondence with contractual and/or financial implications, letters shall normally be used.

The Contractor shall address all his letters to the Consultant. The original shall be submitted to the Consultant and a copy to the Employer.

Letters to the Contractor shall usually be submitted by the Consultant, with a copy to the Employer. Should the Employer wish to write directly to the Contractor, he shall copy to the Consultant.

b) **TELEFAXES**

Telefax shall be used whenever information, letters, sketches or similar documents have to be transmitted urgently, or in advance. However, a document having been "faxed" shall be considered a valid document only once receipt has been acknowledged or after submission of the original letter/document.

c) **E-MAIL (Unofficial correspondence)**

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For ease of communication, e-mail will be the preferred medium for "normal" communication. However, any communication which the originator regards as Official and "for the record" needs to be on a letterhead, signed and either faxed and/or submitted in hard copy to the recipient. Hence, in the case of a dispute, e-mailed correspondence shall not ipso facto be accepted as proof of error free communication. However, an e-mail shall be considered a valid document only once receipt has been acknowledged or after a response have been received.

The onus is on the sender to either scan confidential information or use Portable Document Format (.pdf).

Forms such as Payment Certificates and Invoices shall always either be scanned in or transmitted in .pdf files.

3.1.2.3 Health and safety risk management

The Contractor shall comply with the Employer's health and safety requirements as contained in Annexure B to this Works Information.

The Contractor shall submit with this Tender, a complete Health and Safety Plan for this project, for the Employer's approval.

The Employer and the Contractor hereby agree, in terms of the provisions of any relevant legislation governing safety or health, that the Contractor as an employer in its own right and in its capacity as contractor for the execution of the works, shall have certain obligations and that the following arrangement shall apply between them to ensure compliance by the contractor with the provisions of the legislation, namely:-

- (a) The Contractor undertakes to acquaint the appropriate officials and the employees of the contractor with all relevant provisions of relevant legislation and the regulations promulgated in terms thereof, and
- (b) The Contractor undertakes that all relevant duties, obligations and prohibitions imposed in terms of the relevant legislation and regulations will be fully complied with, and
- (c) The Contractor hereby accepts sole liability for such due compliance with the relevant duties, obligations and prohibitions imposed by the relevant legislation and regulations and expressly absolve the Employer and the Employer's Consulting Engineers from being obliged to comply with any of the aforesaid duties, obligations and prohibitions in respect of the work included in the contract.
- (d) The contractor shall be obliged to report forthwith to the Employer any investigation, complaint, or criminal charge which may arise as a consequence of the provisions of the relevant legislation and regulations pursuant to work performed on behalf of the employer and shall, on written demand, provide full details in writing of such investigation, complaint or criminal charge.

The Contractor shall furthermore comply with all the Employer's requirements for security and safety. An active accident prevention programme shall be maintained. A responsible person shall be appointed, and he is to co-operate fully with the Engineers Representative in all matters pertaining to accident prevention.

The Contractor shall comply with:

- The Occupational Health and Safety Act, 1993, and all regulations.
- The Construction Regulations, 2003.
- The Contractor undertakes not to do, or not to allow anything to be done which will contravene any of the provisions of the Act, Regulations or Safety and Operating Procedures

When apparatus is in commission or is to be commissioned:

- The Contractor shall ensure that a team member on site of the Contractor is authorized as a Responsible Person.
- The Contractor shall ensure that the Responsible Person shall supervise the works at all times and be available to take permits where necessary.

The Employer may, at any stage during the duration of this contract, be entitled to:

- do safety audits at the Contractor's premises, its work-places and on its employees;
- refuse any employee, sub-contractor or agent of the Contractor access to its premises if such person has been found to commit any unlawful act or any unsafe working practice or is found to be not authorized or qualified in terms of the Act

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- issue the Contractor with a work stop order should the Employer become aware of any unsafe working procedures or conditions or any non-compliance with the Act, Regulations and Procedures referred to above by the Contractor or any of its employees, sub-contractors or agents.
- No extension of time will be allowed as a result of any action taken by the Employer in terms of the above and the Contractor shall have no claim against the Employer as a result thereof.
- An authorized Employer's representative will be on site for regular site visits to monitor the Contractor's implementation of health, safety and quality Standards.
- The works to be enclosed with chevron barricade tape supplied and installed by the Contractor and set out by the Employer.
- The Contractor shall be responsible for all expenses incurred to ensure adherence to Health and Safety Regulations as stipulated above.
- The Contractor shall comply with all the requirements of the CONSTRUCTION REGULATIONS.
- The Contractor shall adhere to the applicable standards and procedures attached to this contract.

3.1.2.4 Environmental constraints and management

The Contractor shall comply with the environmental criteria and constraints stated in the Employer's EMS included in the tender document on page 49.

3.1.2.5 Quality assurance requirements

- a) The Contractor needs to submit a quality plan indicating the control points for quality to ensure that the works are done according to specification.
- b) The Contractor shall control his activities and processes in such a way as to ensure compliance with the Employer's Specifications and Standards. He shall carry out, as a minimum requirement all the tests laid down in the specifications and shall submit all the test results to the Employer.
- c) The Employer's Specifications and Standards, as indicated in this document, are requirements of this contract.
- d) The Contractor shall be responsible for the relevant Quality Assurance Requirements to be imposed on his sub-contractors and suppliers of materials in terms of the above standards.
- e) The Contractor shall submit with this Tender, a complete list of sub-contractors, he intends to make use of for this project, for the Employer's approval. The Contractor will not appoint any sub-contractor without the acceptance of the Employer.
- f) Only new, good quality materials may be used and where applicable materials must comply with the specifications of the South African Bureau of Standards or IEC Specifications.

3.1.2.6 Programming constraints

- All outages shall be performed during the night from 00H00 until 04H00.
- All supplies to all loads shall be maintained during the extended working hours of ACSA.
- During the execution of this contract, the existing 400V networks will remain in full operation. It is of the utmost importance that the Contractor shall make do allowance for the co-ordination of his program with the operation of the network.

Any anticipated delays or problems experienced with the execution of construction activities shall immediately be brought to the attention of the Engineer.

No standing time or extension of time will be allowed due to bad co-ordination and/or programming by the Contractor and should his action cause unplanned outages, then he will be accountable, therefore.

3.1.2.7 Contractor's management, supervision and key people

None

3.1.2.8 Invoicing and payment

Within seven days of receiving a payment certificate from the *Project Manager* in terms of core clause 51.1, the *Contractor* provides the *Employer* with a tax invoice showing the amount due for payment equal to that stated in the *Project Manager's* payment certificate.

The *Contractor* shall address the tax invoice to Airports Company South Africa SOC Ltd. and include on each invoice the following information:

Name and address of the *Contractor* and the *Project Manager*;

The contract number and title; INSTRUMENT LANDING SYSTEM REPLACEMENT PROJECT

Contractor's VAT registration number;

The *Employer's* VAT registration number 493 013 8393;

Description of work done by cross reference to *Project Manager's* certificate;

Total amount invoiced excluding VAT, the VAT and the invoiced amount including VAT;

3.1.2.9 Contract change management

None

3.1.2.10 Provision of bonds and guarantees

The form in which a bond or guarantee required by the *conditions of contract* (if any) is to be provided by the *Contractor* is given in Part 1 Agreements and Contract Data, document C1.3, Sureties.

The *Employer* may withhold payment of amounts due to the *Contractor* until the bond or guarantee required in terms of this contract has been received and accepted by the person notified to the *Contractor* by the *Project Manager* to receive and accept such bond or guarantee. Such withholding of payment due to the *Contractor* does not affect the *Employer's* right to termination stated in this contract.

3.1.2.11 Training workshops and technology transfer

The operation of all the equipment supplied under this contract shall be demonstrated at length to the local maintenance personnel.

3.1.3 Engineering and the Contractor's design**3.1.3.1 Employer's design**

The Employers' design is limited to the following:

- Layout of the existing buildings and equipment.

3.1.3.2 Parts of the works which the Contractor is to design

The Contractor is responsible for the detail design of the following:

- See C3.2 below.

3.1.3.3 Procedure for submission and acceptance of Contractor's design

The Contractor shall as a minimum submit the following for approval:

- Returnable documents on T2.1 Part 1 and 2 will review after award.

3.1.3.4 Other requirements of the Contractor's design

None.

3.1.3.5 Use of Contractor's design

See core clause 22.1 of NEC.

3.1.3.6 Design of Equipment

None

3.1.3.7 Equipment required to be included in the works

- As per price list above.

3.1.3.8 As-built drawings, operating manuals and maintenance schedules

Three copies of the complete instruction manuals inclusive of all drawings for the operation and maintenance of the equipment shall be handed over to the Engineer (Acsa).

Two CD's containing the following shall also be handed over to the Engineer (Acsa):

- A soft copy of the complete instruction manual and drawings
- Setting files for all relays and meters
- Relay and meter software for communication to the relays and meters

3.1.4 Procurement**3.1.4.1 People****3.1.4.1.1 Minimum requirements of people employed on the Site**

The Contractor is to be registered on the ACSA database for contractors and permits are to be obtained from ACSA for all workers on site.

3.1.4.1.2 BBBEE

Requirements are included in the Invitation to Bidders

3.1.4.2 Subcontracting**3.1.4.2.1 Mandatory manufacturers**

None

3.1.4.2.2 Subcontract documentation, and assessment of subcontract tenders

None

3.1.4.2.3 Limitations on subcontracting

None

3.1.4.2.4 Attendance on subcontractors

None

3.1.4.3 Plant and Materials**3.1.4.3.1 Quality**

As per company quality plan or standard.

3.1.4.3.2 Plant & Materials provided “free issue” by the *Employer*

The Employer will provide the following items:

None

3.1.4.3.3 Contractor’s procurement of Plant and Materials

None

3.1.4.3.4 Spares and consumables

None

3.1.4.4 Tests and inspections before delivery

The whole of the materials used in the Project shall be subject to such inspection and test at the manufacturer’s works as prescribed in the appropriate material standards, required in the specific clauses of the Contract or the Engineer may direct from time to time as the work proceeds.

The manufacturer shall perform all tests as prescribed by IEC or other standards applicable to the equipment. In addition to these tests the manufacturer shall perform the tests specified in the manufacturer’s own factory standard for quality control.

The Engineer reserves the right to witness any or all tests and the Contractor shall inform the Engineer at least 7 days in advance of any tests which will be performed.

The cost of such inspection and tests, including the provision and use of test equipment, with a quantified number of visits by the Engineer shall be included in the Tender Price.

If, due to the Contract work and/or component materials not complying with this specification, further tests are necessary, the Contractor shall pay all additional costs which may be incurred in re-testing.

The approval by the Engineer of the results of such inspection and tests shall not relieve the Contractor of his obligations under the Contract for the satisfactory performance of the plant and materials.

During the execution of the Contract, test specimens, if required by the Engineer, shall be taken from the materials for the purpose of check tests or analyses by Independent Authorities. Such specimens shall be prepared for testing and forwarded at the expense of the Contractor to the Testing Authorities selected by the Engineer.

The Contractor shall deliver to the Engineer three copies of the test certificates covering all tests. In case the original certificate is not in the English language, three copies of a translation into English of the certificate plus one copy in the original language shall be delivered to the Engineer.

As a minimum, Factory Acceptance Tests shall be performed on the following:

- None (Will be review upon award)

3.1.4.5 Marking Plant and Materials outside the Working Areas

None

3.1.4.6 Contractor’s Equipment (including temporary works).

None

3.1.5 Construction

3.1.5.1 Temporary works, Site services & construction constraints

3.1.5.1.1 *Employer's Site entry and security control, permits, and Site regulations*

All contractor Employees shall obtain permits from ACSA for access to site.

3.1.5.1.2 Restrictions to access on Site, roads, walkways and barricades

All deliveries that will obstruct portions of the roadways or public routes for any period of time are to be restricted between 00h00 and 04h00. All logistics affecting operations are to be approved by the relevant ACSA Managers.

All vehicles related to the contractor's works are to be parked within the contractor's hoarded site or in public parking with costs for the contractor's account. Any contractor vehicle towed for illegal parking will be for the contractor's account.

3.1.5.1.3 People restrictions on Site; hours of work, conduct and records

Contractors are limited to their actual site establishment areas and places of work and under no circumstances will materials, equipment, tools, cooking or any other disturbance be allowed in public areas and delivery of materials via the normal airport traffic routes is strictly prohibited. Use of the public people mover infrastructure is prohibited.

Contractor's employees are to be clearly identifiable and they must be discouraged from visiting the public areas of the airport.

3.1.5.1.4 Health and safety facilities on Site

None

3.1.5.1.5 Environmental controls, fauna & flora, dealing with objects of historical interest

None

3.1.5.1.6 Title to materials from demolition and excavation

The Contractor has no title to materials from demolition and excavations.

3.1.5.1.7 Cooperating with and obtaining acceptance of Others

The Employer has various contracts in progress and the Contractor may be required to adjust his program and activities to coordinate with others.

All hoarding is to comply with the ACSA standard (MANAGER – (011) 921 6226).

The hoarding is to be maintained to ACSA's specifications at all times. Any costs incurred by ACSA for repairing the Contractor's hoarding will be forwarded to the contractor for payment. To avoid this, the contractor is to ensure that the hoarding is maintained on a daily basis.

No existing finishes outside the defined site are to be changed without prior approval by ACSA.

All electrical installations and loading is to be approved by ACSA Electrical Division (MANAGER - (011) 921 6883) prior to any work being executed.

All cable installations are to comply with the ACSA specification as a minimum and be approved by ACSA IT and Electrical.

All mechanical alterations or impact thereon, i.e. air-conditioning, are to be approved by the ACSA Mechanical Division (MANAGER - (011) 921 6225) prior to any work being executed.

The use of any people mover infrastructure for delivery is to be approved by Mechanical Division (MANAGER).

All alterations to fire detectors and sprinklers or impact thereon are to be approved by ACSA Mechanical Division (MANAGER - (011) 921 6225) prior to any work commencing.

3.5.1.8 Publicity and progress photographs

None

3.1.5.1.9 Contractor's Equipment

The Contractor shall as part of his reporting includes a list of Contractors Equipment and material on site. The list shall include Registration numbers, serial numbers, whether it is rented with the provider's details.

3.1.5.1.10 Equipment provided by the Employer

The Employer will provide only equipment listed in 4.3.2.

3.1.5.1.11 Site services and facilities

The site as detailed on the drawings will be available to the Contractor for the execution the Works. Limited power will be available within the rooms. The Contractor is to source his own water and will be responsible for his own waste disposal. The Contractor shall be responsible for the supply on site of his own telephone or cellular phone.

Existing cable trenches and cable ladders and trays are to be utilized for cable routes. The Contractor is to open cable trenches and include the cost in his rates. All cable trench covers are to be returned to their positions, all covers damaged or broken by the Contractor is to be replace by the contractor at his costs. All cable trays and ladders are to be tidied after cable installation.

3.1.5.1.12 Facilities provided by the Contractor

The Contractor shall erect and maintain at his costs his own covered storage and office that he may require. The yard shall be fenced by the Contractor and maintenance of the yard will be his responsibility. The yard shall be kept in a clean and tidy condition at all times to the satisfaction of the Engineer. On completion of the Project, all structures and installations shall be removed from site, to the satisfaction of the Engineer.

3.1.5.1.13 Existing premises, inspection of adjoining properties and checking work of Others

None

3.1.5.1.14 Survey control and setting out of the works

The Contractor will be responsible for setting out the positions of the new equipment. The Engineer is to approve such positions before actual installation commence.

3.1.5.1.15 Excavations and associated water control

None

3.1.5.1.16 Underground services, other existing services, cable and pipe trenches and covers

The Contractor shall be liable for all damage and breakage to other services. Repair will be done by adequately qualified personnel or contractors. If the damages or breakage is not repair / replaced to the satisfaction of the Engineer within a reasonable time, the Engineer shall be entitled to appoint another Contractor to repair such damage or breakage and debit the account of the Contractor. All damages and breakages are to be reported to the Engineer.

3.1.5.1.17 Control of noise, dust, water and waste

ILS REPLACEMENT PROJECT

The contractor shall keep noise to a minimum and to between 00h00 and 04h00.

The site is to be maintained in a reasonable state of tidiness at all times.

Rubble may not be accumulated on site. Suitable skips are to be provided for the works.

All dust and debris resulting from construction work is to be contained within the hoarded site. Any materials and rubble outside the hoarded site will be removed by ACSA from the Airport without notice to the contractor and will be for the contractor's account.

The Contractor will ensure the proper handling and carting away of spoil material, and the cleaning of ablution areas set aside for the use of the contractor's staff.

3.1.5.1.18 Sequences of construction or installation

To be finalised by awarded bidder and submitted for approval.

3.1.5.1.19 Giving notice of work to be covered up

Notice of work to be covered up is to be given by the Contractor to the Engineer.

3.1.5.1.20 Hook ups to existing works

All attachment points for the overhead busbar systems are to be marked and approved by the Engineer.

3.1.5.2 Completion, testing, commissioning and correction of Defects**3.1.5.2.1 Work to be done by the Completion Date**

On or before the Completion Date the *Contractor* shall have done everything required to Provide the Works except for the work listed below which may be done after the Completion Date but in any case, before the dates stated. The *Project Manager* cannot certify Completion until all the work except that listed below has been done and is also free of Defects which would have, in his opinion, prevented the *Employer* from using the *works* and Others from doing their work.

	Item of work	To be completed by
	None	Within days after Completion

3.1.5.2.2 Use of the works before Completion has been certified

The Employer will only take over fully tested and commissioned operational boards. The existing equipment is in operation and any outages during the day between 04h00 and 22h00 cannot be accommodated. A gradual transfer of cables from the existing to the new distribution boards is required.

3.1.5.2.3 Materials facilities and samples for tests and inspections

The Contractor will provide all materials, facilities and samples for tests and inspections as described in the Works Information and Detail Specification.

3.1.5.3.4 Commissioning

Detail descriptions for commissioning are included in Annexure A and B. Commissioning will be done in phases and is to be completed before completion.

3.1.5.2.5 Start-up procedures required to put the works into operation

None

3.1.5.2.6 Take over procedures

All documentation as required by the Employer and Engineer is to be submitted.

3.1.5.2.7 Access given by the Employer for correction of Defects

All access and outages are to be pre-arranged with ACSA before entering buildings

3.1.5.2.8 Performance tests after Completion

None

3.1.5.2.9 Training and technology transfer

The Contractor is to provide hands-on training on the equipment during installation.

3.1.5.2.10 Operational maintenance after Completion

ATNS will continue with maintenance once project is completed.

3.1.6 Plant and Materials standards and workmanship

Plant and Material standards and workmanship requirements are included in Annexure A and B.

3.1.6.1 Investigation, survey and Site clearance

The Contractor shall visit the site during the equipment detail design phase to ensure that the equipment will fit within the existing building structures.

3.1.6.2 Building works

None.

3.1.6.3 Civil engineering and structural works

Not applicable

3.1.6.4 Electrical & mechanical engineering works

The specifications are all included in the Annexure A: Detail Technical Specification of this document.

3.1.7 List of drawings

3.1.7.1 Drawings issued by the *Employer*

This is the list of drawings issued by the *Employer* at or before the Contract Date and which apply to this contract.

Note: Some drawings may contain both Works Information and Site Information

Drawing number	Revision	Title
N/A		

3.2 Contractor's Works Information

3.2.1 Work to be performed:

DETAIL SCOPE OF WORK OR TAMBO INTERNATIONAL AIRPORT

Project Duration: 36 Months

1. General Scope of Work

The ILS consists of:

- Localizer electronic system and localizer antenna subsystems
- Glide slope electronic system and glide slope antenna subsystems
- Distance Indication Equipment - DME subsystems
- Localizer far field monitoring equipment.
- Localizer and glide path near field monitoring.
- Remote control status unit (RCSU) and Control Tower Unit (CTU).

The scope includes but not limited to the following:

- Geographical and positioning survey study to cater for terrain variation.
- Software simulation.
- Design and selection of the most suitable CAT III ready ILS at RWY 03R, 21L, 03L, and 21R.
- RF cables, Electrical KIOSK replacements, Fibre network replacements and end-user equipment.
- Provision for dual system air-conditioning split unit and connected.
- SACAA application or notification of the obstruction within the aerodrome
- Obstacles height lowering and clearance.
- Painting of the obstruction mast as per ICAO annexure 14 for mast, frangibility requirement for near field antenna within 900m of the landing approach lights.
- Provision of the four hours battery or inverter technology using latest lithium batteries for all the ILS system shelters.

- Decommissioning of the current CAT II ILS system RWY 03R, 21L, 03L, 21R.
- Supply and delivery of the new CAT III C ILS system for RWY 03R, 21L, 03L, 21R.
- Installation of the new CAT III C ILS system for RWY 03R, 21L, 03L, 21R.
- Interface of the new ILS system with ATNS DAID, CTU and other peripheral systems
- Conduct CAT II Flight calibration to be done on the entire ILS system including the ground calibration.
- The ILS system must include all computers and servers to be installed at the ILS sites and the ATC.
- Provide a software assurance with a highest-level determination.
- Fibre network communication redundancy, ring feed topology. Scope part of the Navigational Aid Fibre Project at ORTIA.
- Determination of the Localiser Sensitive Area (LSA) and Localiser Critical Area (LCA) to minimise the interference with CAT II system.
- Clear installation methodology taking into consideration that one runway ILS should be decommissioned and commissioned before the other runway ILS is installed. One runway ILS system to be installed at the time and accepted before the next runway ILS is installed. The plan is to start 03R as it has reached its design life, then replace 03L, 21R and complete with 21L.
- Survey and engineering assessment of Relocation of 03L Glide Path to the other side of the runway due to interference by aircraft when queuing for departure (Annex G).
- ILS 03L and 21R Shelter complete replacement with new shelter and assessment of power supply and concrete floor.
- Perform ILS Integrity Classification

2. Site Assessment, Site Survey and Terrain Determination

- Conduct the site survey on both runways 03R/21L and 03L/21R datum elevation and surrounding site terrain to ensure that a site is reasonably clear of any obstructions which could affect the radiated signals. (WGS-84)
- Conduct the survey to determine the optimal position of both ILS Localiser and Glide Path antennas, monitoring equipment and subsystems
- Provide a detailed survey report, drawings (all detailed, including overview pictures with details) , and survey elevation angles to be integrated with the installed PAPI system lighting.
- Conduct assessment on site-specific factors that should be considered, including equipment sitting, scalloping, ground test procedures and flight verification procedures. All identified obstacles should be factored in the design to eliminate any probable system signal disturbances. Note: there's a current scalloping issue at 03R.

3. Design and selection of CAT III C ILS System

- Demonstrate by means of Statement of Compliance that the systems have passed the design requirements, and it is certified according to ICAO Annexure 10 SARPS and ICAO Doc 8071 or European equivalent standards.
- System to integrate the site-based risk assessment to ensure the system reliability.
- Hardware and Software assurance documentation to be provided with the respective system assurance level.

4. Civil works for the shelters and cabling

- Based on the initial assessment conducted in number 1, the necessary civil works should be executed for planting the antennas, laying of signal cables, identifying markers, marking reference datum, mounting nearfield antenna, mounting far field antenna, mounting auxiliary system, and laying electrical cables.
- All existing position of the ILS Localisers and ILS Glide Path shall be maintained. The berthing of this equipment shall be maintained to minimise the approval process through the municipality for erection of the fixed structure as per municipal bylaws.

- Ground check points for the localisers need to be surveyed and provide a permanent indicator secured through concrete for ease of location.

5. SACAA application or notification of the ILS Systems obstacles within the aerodrome

- Based on the survey assessment in number 1, bidder to submit the obstacles approval based WSG coordinates to SACAA for approval prior the planting of the antennas and ILS subsystems.
- Obstacles caused by ILS System installation to be marked as per ICAO Annexure 14 requirements.
- Obstacles to be marked and painted with the durable paint, and the required obstruction lights where the protrusion of the mast or erected structure violate Obstacle Limitation Surfaces

6. Obstacles height lowering and clearance.

- Complete Aerodrome perimeter survey to identify any obstacles that will violate the increased LSA and LCA due to the ILS installation.
- Identify the new obstacles which will violate Obstacles Limitation Surfaces and notify the Aerodrome for rectification or reporting to SACAA.
- The Aerodrome shall decide whether to lower or eliminate the newly introduces obstacles due to increased LSA and LCA on receipt of the detailed survey report from the bidder during the complete aerodrome survey.

7. Frangibility of Equipment within 900m from threshold

- All ILS equipment that installed within 900m from threshold on either side of the Runways should be frangible, where it is not practically possible, the exemption approval from SACAA should be sought by the service provider and approval handed to ACSA for record purpose.

8. Distance between the existing ILS shelters and ILS Antennas

- Supply, deliver and lay the 1 x 110mm cable conduits and 1x spare between individual ILS site and antennas as per table below (these are measurable items

- Supply, deliver and install the appropriate size RF cable between the antenna and the shelter.

ILS Shelter	Distance from Shelter to LOC/GP antenna	Distance from Shelter to the Near Field Antenna	Distance between opposite Shelter to the Far Field Antenna
LOC 03R	55m	170m	60m
GP 03R	5m	70m	100m
LOC 03L	80m	235m	80m
GP 03L	5m	70m	100m
LOC 21R	65m	170m	60m
GP 21R	5m	80m	100m
LOC 21L	22m	160m	80m
GP 21L	5m	65m	100m

9. Equipment shelters equipment replacement for four (4) ILS sites

- ILS LOC 03R, ILS LOC 03L, ILS LOC 21R, ILS LOC 21L, ILS GP 03R, ILS GP 03L, ILS GP 21R, ILS GP 21L.
- Refurbishment of the building sites, including DB replacement, obstruction lights, earth mat, civil works and lightning protection.
- Supply, deliver and install 8 x 18000 BTU Air conditioner units, high reliable units coated with anti-corrosion coatings, complete with all accessories and ACCU. 2 Year warranty. Dual system air-conditioning.

10. Redundancy Fibre Network Communication between 4 x Sites and ATC Tower

- There is currently an existing fibre network for communication between the sites and the tower. The ILS units are currently connected to the tower via the OTN communication system. These communication fibre cable network will remain in place. Replacement is required for OTN communication network system. The new ILS system will be required to communicate using these new communication OTN networks. Supply, deliver and install redundancy network switches with associated housing cabinets. Installation should include any required fibre to serial converters and fibre splicing.
- Decommission the existing OTN communication cabinet and switches.

11. Cable route from equipment room at ATNS Building to the ATC Tower

- The fibre network cable terminates inside the ATNS equipment room
- The cables total distance from the equipment room to the furthest point in the tower is about 40 m for remote display of the ILS information in the tower.
- Communication protocol between ILS and ATNS will be dependent on the equipment to be supplied.

12. ILS Localiser and Glide Path Specification

- The bidder shall provide a point-to-point statement document indicating how the bidders complies to each and every requirement contained in the **D109 MAN Standards and Guidelines for Instrument Landing System**.
- The bidder to provide of evidence or statement of compliance with Annex 10 for the ILS.
- Supply, deliver and install lithium batteries which have a minimum of six (6) hours back up capacity for each ILS System Equipment
- Supply, deliver and install corresponding servers, computer and display monitors at ATC tower.

13. DME Specifications

- The bidder shall provide a point-to-point statement document indicating how the bidders complies to each and every requirement contained in the **D109 MAN Standards and Guidelines for Instrument Landing System**.
- The bidder to provide of evidence or statement of compliance with Annex 10 for the DME.

14. Installation Methodology

- The ILS replacement will take place on the live operating runway; therefore, all safety protocol needs to be adhered to. ACSA Safety requirement will be the guiding principle.
- One ILS System i.e. Localiser and corresponding Glidepath will be decommissioned at the time whilst the installation is underway. The timing and scheduling will be critical in order to raise the AIP supplement taking into consideration the allowable time to raise the supplement through AIRAC cycle.

The programme needs to be precise and adhered to during construction period. Commissioning and acceptance will be completed on the newly installed ILS system before the next installation is allowed.

- The diversion airport and the period of diversion need to be published as the part of the AIP supplement. It is therefore expected of the bidder to ensure that the time frames submitted are achievable to avoid penalties and disturbance to operations
- Bidder to submit the methodology, identifying all critical milestones, dependencies, critical path and float

12. Commissioning

- Extensive ground and flight tests should be made to ensure that all parameters of the radiated signal are compliant with ICAO Annex 10 SARPS. Guidance for conducting these tests may be found in ICAO Doc 8071 and guidance for evaluating the results is available in ICAO Doc 8071 and in the Attachments to Annex 10. Long term performance measurements should be made to determine the stability of key parameters in an operational environment.
- The supplier will need to cost the commissioning (Flight Calibration) of the ILS through engagement with the SACAA.
- **Note:** Flight calibration can only be conducted during the day and visible conditions.
- Ground check should be conducted and form the part of hand over documentation.
- Flight calibration to be conducted for Category II system.

13. Equipment Protection

- Provide the adequate power surge and power upstream protection devices as per equipment power rating.
- Provide adequate earthing system for earth fault protection. Earth fault protection will be tested during installation and commissioning. Earth measurement test must be below 5ohms.
- Provide adequate lightning protection devices for each field and equipment room devices as per SANS 1063 and SANS 10142-1

14. Equipment Familiarisation

- Provide adequate training to maintenance team and ATC operators. Maintenance team to be trained is ATNS personnel, ATC Operators and ACSA personnel.
- FAT - (ATNS & ACSA) – 2 personnel from ATNS and 2 personnel from ACSA per ILS
- Factory training (specialised training on the system): 2 ATNS Specialists per ILS and 2 personnel from ACSA.
- Technical and Maintenance Training: 10 people
- Operator Training: 4 people

NB: Number of personnel, people and operators will be determined by ATNS and ACSA.

15. Programme and Scheduling

Bidder to cater for AIP supplement publication (noting AIRAC cycle publication dates), SACAA approvals, municipality approvals (where applicable), AIT training, personnel vetting, risk assessment approvals by ACSA prior commencement of work, SACAA flight calibration scheduling and execution. Taking into consideration that only one ILS system will be decommissioned at the time.

16. Test Equipment

Provide test equipment for NAV Analyzer of ILS Localizer, Glide Path, DME, VOR and including ILS checker software with integrated GPS for maintenance team.

17. Hand Over Documentation

Item	Description of Handover requirement	YES/NO	
1.	Design reports include design calculations of the various ILS positions required and sector areas e.g. LSA, LCA etc		
2.	As-built drawings (.dwg format) depicting all ILS Systems and subsystem positions and connections (cable layout and labelling).		

3.	A list of "Nameplate Data" giving full particulars of serial numbers and other descriptive data pertaining to the equipment installed		
4.	Electronic datasheets of equipment purchased		
5.	User Guide Manuals and maintenance manuals		
6.	An electronic and hard copy of all routine tests results, and measurements as recorded during site and factory testing		
7.	Formal record of the training provided to the ACSA and ATNS staff by the Bidder.		
8.	A list of minimum spares, tools and testing equipment supplied		
9.	All certificates and records of the testing and commissioning phase		

18. Fiber Interface system

Specification:

a. Temperature (Node/Unit surrounding)

- Operation: -20 °C to +60 °C, -4 °F to +140 °F.
- Storage and shipping: -20 °C to +70 °C, -4 °F to +158 °F.

b. Relative Humidity (non-condensing)

- Operation: 20 % to 80 % at 25 °C (+77 °F)
- Storage and shipping: 20 % to 95 %

c. Optical modules

- Single mode SFP optical modules, should be replaceable hot-pluggable modules.
- These SFP modules should use LC optical connectors.
- SFP modules for distances from 100m to 10km.
- Single mode wavelength 1310nm and 1550nm.

d. Dual Ring topology

- In normal operation, all data of the connected equipment is transmitted on one ring, whereas the second ring is on standby. The standby ring is kept in synchronization in order to monitor the backup availability.
- The second ring serves as backup and can completely take over all data transport, whenever required in an emergency situation.
- The dual ring structure should use parallel optical fibers, provides a unique “hot standby” or self-healing capability. If a fault should occur, the system will still function to the automatic reconfiguration of the fiber transmission paths. This should happen between 50ms to 120ms.
- The communication should not be interrupted while the ring is reconfiguring, during a fiber cable break or a Node/Unit failure.

e. Ethernet Network

- 4 Ethernet ports 100 Mbps that are fully compliant with the IEEE802.3 standard.
- MDI/MDIX auto-crossover, auto-negotiation.
- Ethernet Network the bandwidth through the selectable from 1 Mbps up to 100 Mbps
- Fast Ethernet ports point-to-point and multipoint configurations with a maximum bandwidth of 100 Mbps.
- Ethernet services should be configurable for different secure LAN segments to allocate dedicated bandwidth and increase cyber security.
- Ethernet segments should be VLAN compatible.
- These ports should be configurable for point-to-point, multipoint, multidrop and broadcast connections.
- The Ethernet services should all be included in one Node/Unit, no separate standalone interfaces for each service.

f. Serial Interface

- Four low-speed data ports (DB9 sub-D)
- RS232 EIA/TIA-232-E and CCITT V.28
- RS422 EIA RS422 and CCITT V.11
- RS485 EIA RS485
- Support RS232, RS422 or RS485 applications protocols.
- Serial data rate up to 100kbps (RS-232) and up to 600kbps (RS-422).
- Transmission Asynchronous or Synchronous.
- Full duplex capability.
- The Serial services should all be included in one Node/Unit, no separate standalone interfaces for each service.

g. Power Supply.

- Redundant power supplies needed for each Node/Unit, to increase reliability. If one power supply fails, the other power supply automatically takes over.
- AC Input 180-240V.

h. Lightning and Earthing Protection

- Each Node/Unit should be connected to the building or shelter earth bar.
- Lightning protection required between the Node/Unit and the ILS/DME/RCMS equipment for each service.

i. Remote Monitor and Configuration GUI

- Fiber subnetworks management via a GUI (Graphical User Interface).
- GUI application functions to configure, supervise and maintain the Network from a central location (FAOR Equipment room).
- GUI application should show live status of the fiber ring (network), including the fiber ring optical warnings and alarms.
- Network status, events, warnings, alarms and failures should be shown.

- A dedicated PC design to run the GUI software should be included and installed in the FAOR Equipment room.

- Configuration database should be saved and be able to backup for safe storage.

19. Fiber Optic installation.

Fiber Optic cable requirement:

- A single mode, minimum 24 core fiber optic cable will be supplied.

- Protection of the fiber optic cable from rodent and environmental damage is required.

- Fiber patch panels, 24 port ST Single mode to be supplied and spliced with ST midcouplers, to be installed inside a standard 19-inch racks.

- The Fiber patch panel has an Ingress Protection rating of IP20 so it is capable of withstanding everyday handling and dust.

Fiber Optic Cable trenching requirements:

- If trenching is required, provision will be made for the installation of danger tape and route markers.

- A complete survey of the route on completion and an associated drawing in paper and electronic format.

- Trenching to a minimum acceptable depth appropriately back filled and compacted to comply with airport requirements.

Cable sleeve requirements:

- If new sleeves are required, provision will be made for Cable sleeves with a diameter that will accommodate at least three fiber optic cables, recommended 110mm Nextube sleeves.

- Two separate sleeves to be installed if the two fiber rings are not physically separated.

- Draw wires will be supplied for each sleeve or sub-sleeve installed.

- Provision will be made to seal the sleeves and sub-sleeves after installation to prevent rodent and water ingress in the sleeves.

Lightning protection requirement:

- If an armored cable is used the armored shield should be stripped before it enters the building or shelter. The armored shield should be bonded to the building or shelter earth bar.
- Lightning protection will be included to isolate lightning surge from entering the building or shelter.

Manhole Requirement:

- In the event that new manholes are required, provision will be made for the manholes to be supplied and installed at regular intervals not exceeding the practical distance for pulling through the fiber optic cable.
 - Standard dimensions for the manholes will be required.
 - Manholes that are installed next to runways or taxiways to comply with the airport requirements with regard to load factors.
 - Manhole covers to be supplied with a locking mechanism to prevent unauthorized access.
- The manholes to be installed such that it does not present a physical obstacle to aircraft, vehicle or lawnmower.

Labeling Requirement:

- The ATNS standard for the labeling of cables will be implemented.
- All cables will be labelled at the point of entering or leaving the building and cabinets, as well as at any termination point.
- All cables with associated labeling will be documented in the as-build documentation.
- Existing documentation will be amended or appended to reflect the actual installation and layout.

As-Built requirement:

The As-built documentation will contain:

- GPS co-ordinates of the fiber optic route, manholes and markers.
- A detailed drawing of the route in pdf and CAD format.

- All relevant documentation, drawings, specifications, spares list, configuration, set-up parameters, equipment configuration, layouts and locations.
- The cable route will be supplied in a compatible format for incorporation in the ACSA GIS system.
- Existing documentation will be amended or appended to reflect the actual installation and layout.
- Bidder to provide detailed schematic and wiring diagrams of the new installation, drawn and labelled to national standards for all sites.

Acceptance Testing & Hand-over Requirement:

- The pre-requisites for acceptance of the system will be clearly documented.
- The installation of new fiber optic cables or expansion / replacement on the fiber interface system will be performed in such a manner that there is no interruption to the service. If an interruption is anticipated this will be formally communicated and contingency plans put in place.
- A formal cut-over plan will be devised and formally communicated.

C4: Site Information

C4.1: Information about the *site* at time of tender which may affect the work in this contract

1. Access limitations

Access into site will be restricted to permitted personnel through an ACSA permit system and as such all personnel who will forming part of staff that will be executing the works shall be issued with permits.

2. Ground conditions in areas affected by work in this contract

This is not applicable as all the works will be carried out on areas with existing plinths structures which does not require any excavations.

3. Hidden and other services within the *site*

There are no hidden services around the area where works will be performed.

4. Details of existing buildings / facilities which *Contractor* is required to work on

The Contractor will execute the works at the following areas:

- 03L ILS area
- 03R ILS area
- 21R ILS area
- 21L ILS area

