CHIEF DAWID STUURMAN
INTERNATIONAL AIRPORT
AIRPORTS COMPANY SOUTH AFRICA

AIRPORTS COMPANY SOUTH AFRICA SOC LIMITED

REPLACEMENT OF THE DIESEL GENERATORS, TANK AND SWITCHGEAR AT CHIEF DAWID STUURMAN INTERNATIONAL AIRPORT FOR 15 MONTHS.

NEC 3: ENGINEERING AND CONSTRUCTION CONTRACT (ECC)

Between **AIRPORTS COMPANY SOUTH AFRICA SOC LIMITED**

Applicable at Chief Dawid Stuurman International Airport

(Registration Number: 1993/004149/30)

and

(Registration Number: _____)

for **REPLACEMENT OF THE DIESEL GENERATORS, TANK AND SWITCHGEAR AT CHIEF DAWID STUURMAN INTERNATIONAL AIRPORT**

Contents: **No of pages**

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PART C1: AGREEMENTS AND CONTRACT DATA
Part C1: Agreements and Contract Data

C1.1: Form of Offer and Acceptance

The Employer, identified in the Acceptance signature block, has solicited offers to enter into a contract for the procurement of: **REPLACEMENT OF THE DIESEL GENERATORS, TANK AND SWITCHGEAR AT CHIEF DAWID STUURMAN INTERNATIONAL AIRPORT FOR 15 MONTHS.**

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

By the representative of the tenderer, deemed to be duly 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 : ……..

This Offer may be accepted by the Employer by signing the Acceptance part of this Form of Offer and Acceptance and returning one copy of this document 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 Bidder:		
	(Insert name and address of organisation)	
Name & signature of witness		Date

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Acceptance

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

The terms of the contract, are contained in:

Part C1	Agreements and Contract Data, (which includes this Form of Offer and Acceptance)
Part C2	Pricing Data
Part C3	Scope of Work: Works Information
Part C4	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 Returnable 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.

The tenderer shall within two weeks 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. 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 (5) 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	.....	.....
Name & signature of witness	*(Insert name and address of organisation)*	Date .....

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Schedule of Deviations

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

By the duly authorised representatives signing this agreement, the Employer and the Tenderer agree to and accept the foregoing schedule of deviations as the only deviations from and amendments to the documents listed in the Tender Data and addenda thereto as listed in the returnable schedules, as well as any confirmation, clarification or changes to the terms of the offer agreed by the Tenderer and the Employer during this process of offer and acceptance.

It is expressly agreed that no other matter whether in writing, oral communication or implied during the period between the issue of the tender documents and the receipt by the tenderer of a completed signed copy of this Agreement shall have any meaning or effect in the contract between the parties arising from this agreement.

	For the Employer	**For the Bidder**
Signature (s)		
Name (s)		
Capacity		
Name and Address	Airports Company South Africa SOC Limited Chief Dawid Struurman International Airport, ALLISTER MILLER DRIVE, WALMER, PORT ELIZABEHT, 6000	
	(Insert name & address of organisation)	(Insert name and address of organisation)
Name & Signature of witness		Date : ……



Part C1.2a Contract Data

Part one – Data provided by the Employer

The Conditions of contract are selected from the NEC3 Engineering and Construction Contract, April 2013.

Each item of data given below is cross-referenced to the NEC3 Engineering Construction Contract which requires it.

Clause	Statement	Data
1	General	
	The conditions of contract are the core clauses and the clauses for Main Option	
	Main Option Dispute resolution Option	B: Priced contract with Bill of Quantities W1: Dispute resolution procedure
	Secondary Options (incorporating amendments)	X2: Changes in the law X7: Delay damages X13: Performance Bond X16: Retention X18: Limitation of liability Z: Additional conditions of contract of the NEC3 Engineering and Construction Contract, April 2013
10.1	The Employer is (Name)	Airports Company South Africa SOC Limited, Applicable Chief Dawid Struuman International Airport
	Address	Airports Company South Africa SOC Limited ALLISTER MILLER DRIVE, WALMER, GQEBERHA, 6000
	Telephone	041 507 7309
10.1	The Project Manager is	Xolile Bekwa
	Address	ALLISTER MILLER DRIVE, WALMER, GQEBERHA, 6000
	Telephone E-mail address	041 507 7309 nozuko.thambo@airports.co.za
10.1	The Supervisor is	Nozuko Thambo



	Address	ALLISTER MILLER DRIVE, WALMER, GQEBERHA, 6000
	Telephone Email	041 507 7309 xolile.bekwa@airports.co.za
11.2	The works are	**REPLACEMENT OF THE DIESEL GENERATORS, TANK AND SWITCHGEAR AT CHIEF DAWID STUURMAN INTERNATIONAL AIRPORT FOR 15 MONTHS.**
11.2	The following matters will be included in the Risk Register	Availability of As Built information Access to Site Site Constraints and Constructability
11.2	The Works Information is in	Part C3 'Scope of Works' section of this contract
11.2	The Site Information is in	Part C4 'Works Information' section of this contract
11.2	The boundary of the site is	As depicted in Part C4 Site Information
12.2	The law of the contract is the	Law of the Republic of South Africa
13.1	The language of this contract is	English
13.3	The period of reply is	Seven (7) days
3	Time	
31.2	The starting date is	Upon signing of the Contract by ACSA
11.2	The completion date is	24 months after the start date.
30.1	The access date is	Shall be determined by the Project Manager after all required documentation is received and approved.
31.1	The Contractor submits a first (preliminary) programme with the tender by the tender closing date	The preliminary programme submitted with the tender shall be on a Gantt Chart indicating key dates (starting, access, completion, timelines and deliverables.
32.2	The Contractor submits revised programmes at intervals no longer than	Four (4) weeks
35.1	The Employer is not willing to take over the works before the completion date	The Employer and Others will have access to the works during construction or prior to completion. Such access by the Employer and Others shall not relieve the Contractor from liability for the completion of the works in accordance with the Works Information and in terms of this contract.
4	Testing and Defects	
42.2	The defects date is	Twelve (12) months after Completion of the whole of the works

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43.2	The defects correction period is	Two (2) weeks
5	Payment	
50.1	The assessment interval is	Monthly
50.1	The currency of this contract is the	South African Rand
51.2	The period within which payment is made is	Four (4) to six (6) weeks after receipts and acceptance of the tax invoice.
51.4	The interest rate is	The prime lending rate of the Nedbank Bank. as determined from time to time
6	Compensation events	
60.1	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
60.1	The place where weather is to be recorded (on the Site) is	At the Construction Site Office and the records to be kept on site in a file clearly marked for this purpose
60.1	Assumed values for the ten year return weather data for each weather measurement for each calendar month are	See table below
7	Title	No data required for this section of the conditions of contract
8	Risks and Insurance	
84.1	The Employer provides these insurances	Refer to the Insurance Clauses which is attached at the end of the Contract Data
84.2	The Contractor provides the insurance stated in	The Insurance Clauses which is attached at the end of the Contract Data. The insurances are in the joint names of the Parties and provide cover for events which are at the Contractor's risk from the starting date until the Defects Certificate or a termination certificate has been issued.

Month	Days	Month	Days
January	1	July	4
February	1	August	3
March	2	September	2
April	2	October	2
May	3	November	2
June	3	December	1



	The minimum limit of indemnity for insurance in respect of death of or bodily injury to employees of the Contractor 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
9	Termination	No data required for this section of the conditions of contract
10	Data for Main Options	
B	Priced contract with Bill of Quantities	Refer to Part C2 Pricing Data
11	Data for Option W1	
W1.1	The Adjudicator is	The person appointed jointly by the parties from the list of adjudicators contained below
W1.2	The Adjudicator nominating body is	The current Chairman of Johannesburg Advocate's Bar Council
W1.4	The tribunal is	Arbitration
W1.4	If the tribunal is arbitration, the arbitration procedure is	The arbitration procedure is set out in The Rules for the Conduct of Arbitrations 2013 Edition, 7th Edition, published by The Association of Arbitrators, (Southern Africa)
W1.4	The place where arbitration is to be held is	Johannesburg, South Africa.
W1.4	The person or organisation who will choose an arbitrator	The Arbitrator is the person selected by the Parties as and when a dispute arises in terms of the relevant Z Clause, from the Panel of Arbitrators provided under the relevant Z clause if the arbitration procedure does not state who selects an arbitrator. The Arbitrator nominating body is the Chairman of the Johannesburg Advocates Bar Council.
12	Data for Secondary Option Clauses	
X7	Delay Damages	
	Delay damages of the works are	Amount per day is 0.05%, to the maximum of 10% of the Contract value
X13	Performance bond	
X13.1	The amount of the performance bond is	10% of the contract value. Pro-forma draft of a performance bond to be used is attached to this contract.
X16	Retention	
X16.1	The retention percentage is	5% of the Contract value.

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X18	Limitation of Liability	
X18.1	The Contractor's liability to the Employer for indirect or consequential loss is limited to	Nil - Neither Party is liable to the other for any consequential or indirect loss, including but not limited to loss of profit, loss of income or loss of revenue
X18.2	For any event, the Contractor's Total liability incurred and/or damages suffered to the employer's property	Total of the losses incurred and/or repairs to the damages caused
X18.3	The Contractor's liability to the Employer for indirect or consequential loss is limited to	The Total liability incurred and/or damages suffered to the employer's property.
X18.4	The Contractor's liability to the Employer for indirect or consequential loss is limited to	The Contractor's total direct liability to the Employer for all matters arising under or in connection with this contract, other than the excluded matters, is limited to The Total liability incurred and/or damages suffered to the employer's property and applies in contract, tort or delict and otherwise to the extent allowed under the law of the contract. The excluded matters are amounts payable by the Contractor as stated in this contract for Loss of or damage to the Employer's property, Delay damages, Defects liability, Insurance liability to the extent of the Contractor's risks 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
Z	The Additional conditions of contract are	Z1 – Z20
	Amendments to the Core Clauses	
Z1	Interpretation of 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.	
Z2	Providing the Works:	
Z2.1	Delete core clause 20.1 and replace with the following: 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	

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Z3	Other responsibilities:
Z3.1	Add the following at the end of core clause 27: The Contractor shall have 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
Z3.2	The Contractor shall be 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 shall be rectified by the Contractor at the Contractor's own costs.
Z4	Extending the defects date:
Z4.1	Add the following as a new core clause 46: 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
Z4.2	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
Z4.3	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
Z5	Termination
Z5.1	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 recue proceedings".
	Amendment to the Secondary Option Clauses
Z6	Performance Bond
Z6.1	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 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 C.ii of this Contract Data.
Z6.2	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
Z7	Limitation of liability:
Z7.1	Insert the following new clause as Option X18.6: The Employer's liability to the Contractor for the Contractor's indirect or consequential loss is limited to R0.00



Z7.2	Notwithstanding any other clause in this contract, any proceeds received from 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

	Additional Z Clauses
Z8	Cession, delegation and assignment
Z8.1	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
Z8.2	The Employer may cede and delegate its rights and obligations under this contract to any person or entity

Z9	Joint and several liability
Z9.1	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.
Z9.2	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.
Z9.3	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.
Z10	Ethics
Z10.1	The Contractor undertakes:
Z10.1.1	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;
Z10.1.2	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.
Z10.2	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.



Z10.3	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.

Z11	Confidentiality
Z11.1	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.
Z11.2	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.
Z11.3	This undertaking shall not apply to –
Z11.3.1	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;
Z11.3.2	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;
Z11.3.3	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);
Z11.4	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
Z11.5	The Contractor ensures that all his Subcontractors abide by the undertakings in this clause.

Z12	Employer's Step-in rights
Z12.1	If the Contractor defaults by failing to comply with his obligations and fails to remedy such default within 2 weeks of the notification of the default by the Project Manager, the Employer, without prejudice to his other rights, powers and remedies under the contract, may remedy the default either himself or procure a third party (including any subcontractor or supplier of the Contractor) to do so on his behalf. The reasonable costs of such remedial works shall be borne by the Contractor



Z12.2	The Contractor co-operates with the Employer and facilitates and permits the use of all required information, materials and other matter (including but not limited to documents and all other drawings, CAD materials, data, software, models, plans, designs, programs, diagrams, evaluations, materials, specifications, schedules, reports, calculations, manuals or other documents or recorded information (electronic or otherwise) which have been or are at any time prepared by or on behalf of the Contractor under the contract or otherwise for and/or in connection with the works) and generally does all things required by the Project Manager to achieve this end.
Z13	Liens and Encumbrances
Z13.1	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
Z14	Intellectual Property
Z14.1	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.
Z14.2	IP rights remain vested in the originator and shall not be used for any reason whatsoever other than carrying out the works.
Z14.3	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
Z14.4	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
Z14.5	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:
Z14.5.1	the Contractor’s design, manufacture, construction or execution of the Works
Z14.5.2	the use of the Contractor’s Equipment, or
Z14.5.3	the proper use of the Works.
Z14.6	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.
Z16	Dispute resolution:
Z16.1	Appointment of the Adjudicator



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An Adjudicator is appointed when a dispute arises, from the Panel of Adjudicators below. The referring party nominates an Adjudicator, which nomination is either accepted or rejected by the other party. In the instance of a rejection of the nominated Adjudicator, the referring Party refers the appointment deadlock to the Chairman of the Johannesburg Bar Council, who appoints an Adjudicator listed in the Panel of Adjudicators below

The Parties appoint the Adjudicator under the NEC3 Adjudicator's Contract, April 2013

Panel of Adjudicators

Name	Location	Contact details (phone & e mail)
Adv. Ghandi Badela	Gauteng	+27 11 282 3700 ghandi@badela.co.za
Mr. Errol Tate Pr. Eng.	Durban	+27 11 262 4001 Errol.tate@mweb.co.za
Adv. Saleem Ebrahim	Gauteng	+27 11 535-1800 salimebrahim@mweb.co.za
Mr. Sebe Msutwana Pr. Eng.	Gauteng	+27 11 442 8555 sebe@civilprojects.co.za
Mr. Sam Amod	Gauteng	sam@samamod.com
Adv. Sias Ryneke SC	Gauteng	083 653 2281 reyneke@duma.nokwe.co.za
Mr. Emeka Ogbugo (Quantity Surveyor)	Pretoria	+27 12 349 2027 emeka@gosiame.co.za

Z16.2 Appointment of the Arbitrator



An Arbitrator is appointed when a dispute arises from the Panel of Arbitrators below. The referring party nominates an Arbitrator, which nomination is either accepted or rejected by the other party. In the instance of a rejection of the nominated Arbitrator, the referring Party refers the appointment deadlock to the Chairman of the Johannesburg Bar Council, who appoints an Arbitrator listed in the Panel of Arbitrators below

Panel of Arbitrators

Name	Location	Contact details (phone & e mail)
Adv. Ghandi Badela	Gauteng	+27 11 282 3700 ghandi@badela.co.za
Mr. Errol Tate Pr. Eng.	Durban	+27 11 262 4001 Errol.tate@mweb.co.za
Adv. Saleem Ebrahim	Gauteng	+27 11 535-1800 salimebrahim@mweb.co.za
Mr. Sebe Msutwana Pr. Eng.	Gauteng	+27 11 442 8555 sebe@civilprojects.co.za
Mr. Sam Amod	Gauteng	sam@samamod.com
Adv. Sias Ryneke SC	Gauteng	083 653 2281 reyneke@duma.nokwe.co.za
Mr. Emeka Ogbugo (Quantity Surveyor)	Pretoria	+27 12 349 2027 emeka@gosiame.co.za

Z17	Notification of a compensation event
Z17.1	Delete “eight weeks” in clause 61.3 and replace with “four weeks”. Delete the words “unless the event arises from the Project Manager or the Supervisor giving an instruction, issuing a certificate, changing an earlier decision or correcting an assumption.
Z18	BBBEE Certificate
Z18.1	The Contractor shall be expected to annually present a compliant BEE Certificate. Failure to do adhere to these requirements shall be considered a material breach of the conditions of this Contract, the sanction for which may be a cancellation of this Contract.
Z19	Communication
Z19.1	Add a new Core Clause 14.5 and 14.6 to read as follows: The Project Manager requires the written consent of the Employer if an action will result in a change to the design, scope, and Works information that is 5% or more
Z19.2	The Project Manager requires the written consent of the Employer if an action will result in the Completion Date being extended by more than 30 days.
Z20	Delegation
	As stipulated by Section 37(2) of the Occupational Health and Safety Act No. 85 of 1993 as amended the Contractor agrees to the following:



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Z20.1 As part of this contract the Contractor acknowledge that it (mandatory) is an employer in its own right with duties as prescribed in the Occupational Health and Safety Act No 85 of 1993 as amended and agree to ensure that all work being performed, or Equipment, Plant and Materials being used, are in accordance with the provisions of the said Act, and in particular with regard to the Construction Regulations

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PART C1.2b Contract Data

Part 2 ; Data provided by the Contractor

Clause	Statement	Data
10.1	The Contractor is (Name): Address: Telephone No. Fax No.	
11.2	The working areas are	Only the Site Area. See C4 'Site Information'
24.1	The Contractor's Key people are: Name:	CV's to be appended to Tender Schedule

11.2 The completion date is To be finalized in conjunction with the successful Contractor
11.2 The following matters will be included in the Risk Register
- **Existing Services**
- **Access to Site**
- **Delay in supply of material and/or equipment**
- **Progress of the works against the program**
- **Travelling public and ACSA stakeholders**

11.2 The Works Information is in Part C3 'Scope of Works' section of this contract
31.1 The programme identified in the A program on a Gantt Chart indicating timeline, deliverables, dependencies to be submitted with tender

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PART C2: PRICING DATA

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PART C2: PRICING DATA

Part C2.1 Pricing Assumptions

Measurement and payment shall be in accordance with the relevant provisions of the applicable SANS 1200 Section as amended in the Scope of Works.
The units of measurement described in these Bills of Quantities are metric units. Abbreviations used in these Bills of Quantities are as follows:

% =	percent
hr =	hour
ha =	hectare
kg =	kilogram
kl =	kilolitre
km =	kilometre
km-pass =	kilometre-pass
kPa =	kilopascal
kW =	kilowatt
l =	litre
m =	metre
mm =	millimetre
m² =	square metre
m²-pass =	square metre-pass
m³ =	cubic metre
m³-km =	cubic metre-kilometre
MN =	meganewton
MN.m =	meganewton-metre
Mpa =	megapascal
No. =	number
Prov sum =	Provisional sum
PC sum =	Prime Cost sum
R/only =	Rate only
L/sum =	lump sum
t =	ton (1000 kg)
W/day =	work day
months =	months
veh/month =	vehicle month
man-day =	each flagman per day

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

Unit: The unit of measurement for each item of work as defined in the applicable SANS 1200 Section.
Quantity: The number of units of work for each item.



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Rate: The agreed payment per unit of measurement.
Amount: The product of the quantity and the agreed rate for an item.
Lump sum: An agreed amount for an item, the extent of which is described in the Bills of Quantities but the quantity of work of which is not measured in any units.

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

It will be assumed that prices included in the bills of quantities are based on Acts, Ordinances, Regulations, By-laws, International Standards and National Standards that were published 28 days before the closing date for tenders. (Refer to www.stanza.org.za or www.iso.org for information on standards)

6. The prices and rates in these Bills of Quantities are fully inclusive prices for the work described under the items. Such prices and rates cover all costs and expenses that may be required in and for the execution of the work described in accordance with the provisions of the Scope of Work, and shall cover the cost of all general risks, liabilities, and obligations set forth or implied in the Contract Data, as well as overhead charges and profit. These prices will be used as a basis for assessment of payment for additional work that may have to be carried out.

7. Where the Scope of Work requires detailed drawings and designs or other information to be provided, all costs associated therewith are deemed to have been provided for and included in the unit rates and sum amount tendered such items

8. A price or rate shall be entered against each item in the Bill of Quantities. Should the Tenderer not wish to make any charge in respect of an item, a rate of zero “R0.00” or “Nil” shall be entered. An item against which no price is entered will be considered to be covered by the other prices or rates in the Bill of Quantities. Except where rates only are required, insert all amounts to be included in the total tendered price in the "Amount" column and show the corresponding total tendered price. The Tenderer may not group a number of items together and tender one lump sum for such group of items.

The tendered rates shall be valid irrespective of any change in the quantities during the execution of the works under the contract.

No unauthorized amendment shall be made to the Bill of Quantities or any part of the Pricing Data. If such amendment is made or if the Bill of Quantities is not properly completed, the tender will be rejected.

9. The quantities set out in these Bills of Quantities are approximate and do not necessarily represent the actual amount of work to be done. The quantities of work accepted and certified for payment will be used for determining payments due and not the quantities given in these Bills of Quantities.

10. Reasonable compensation will be received where no pay item appears in the Bills of Quantities in respect of work required in terms of the Contract and which is not covered in any other pay item.

11. The short descriptions of the items of payment given in these Bills of Quantities are only for the purposes of identifying the items. More details regarding the extent of the work entailed under each item appear in the Scope of Work.

12. The item numbers appearing in the Bills of Quantities (Schedule A) refer to the corresponding item numbers in the applicable SANS 1200 Section

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C2.2 THE BILL OF QUANTITIES

Refer to Bill of Quantities attached separately as "NEC Annexure BOQ – Main Contractor"

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C2.2.1: BILL OF QUANTITIES – ELECTRICAL CONTRACTOR
(to be included in "NEC Annexture Bill of Quantities – Main Contractor")

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PART C3: SCOPE OF WORK

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Part 3: Scope of Work

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PART C3.1: GENERAL REQUIREMENTS

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C3.1: GENERAL REQUIREMENTS

Introduction

This scope of work is also referred to as the project specification.
Part 3.1 contains a general description of the project, available facilities, and the conditions with which the works have to comply.
Part 3.2 contains the technical requirements and specifications for the project.
Part 3.3 contains the project management requirements.
Part 3.4 contains a schedule of the standardised and particular specifications applicable to this contract.
Part 3.5 ACSA minimum technical requirements
Part 3.6 list of tender drawings and test reports
The Supply Authority: Nelson Mandela Bay Municipality supply the Port Elizabeth International Airport with bulk electricity

Interpretation and Terminology

The following abbreviations are used in this Works Information:

DESCRIPTION	ABBREVIATION / INTERPRETATION
ACSA	Airports Company South Africa SOC Limited
Alternating Current	AC
Automatic meter reading	AMR
Certificate of Compliance	COC
Contract Price Adjustment	CPA
Control and Management System	CMS
Direct Current	DC
Engineering Procurement and Construction	EPC
Factory Acceptance Testing	FAT
Low Voltage	LV
Medium Voltage	MV
Operating and Maintenance	O&M
Point of Supply	POC
Provisional Acceptance Test	PAT
Performance Ratio	PR
Project Quality Plan	PQP
Project Inspection and Test Plan	ITP
Photovoltaic Plant	PV Plant
Rate of Change of Frequency	ROCOF
Toilet or lavatory	WC
Standard test conditions	STC
Approved	Approved in writing by the Employer
Access Date	When the Contractor commence executing the Works, following instruction by the Project Manager (Site handover)

DESCRIPTION	ABBREVIATION / INTERPRETATION



Certificate of Completion	The Works shall not be considered as complete in all respects until the Completion Certificate has been issued by the Project Manager
Contract	The documentation of the agreement between the Contractor and Employer in terms of the Form of Offer and Acceptance
Contract Date	When the contract came into existence
Contractor	The successful Tenderer appointed to execute the Contract
Defects Date	Twelve (12) months after Completion of the whole of the works
Defects Certificate	List of defects issued by the Project Manager or Supervisor to be corrected by the Contractor within 2 weeks
Defects Liability Period	The 12-month period commencing from the issue of the Certificate of Completion
Document	This complete set of bound conditions, specifications, Bill of Quantities, drawings and schedules also referred to as the Tender Document
Drawings	Drawings issued with the Tender Documentation
As Built / Record Drawings	As-Build Drawings of the complete plant including civil works and equipment installation specifications
Employer	The Employer or ACSA
Employer's Agent	The Employer's Agent is BDE Consulting Engineers, acting through a director or an official authorised thereto in writing, also referred to as the Project Manager
Final Completion Certificate	Completion certificate issued by the Project Manger on the Defects Date, after the12 months liability period
Erect	To place or mount and fix in position
Grid	Existing electrical reticulation network
Handover	When the Contractor is given permission to enter the site and claim possession for the construction period
Install	To erect, connect up, and commission, complete with related accessories to the Engineer's satisfaction and approval
Indicated, Shown, Noted	As indicated or shown on drawings
Performance Guarantee	Form of Guarantee issued by the Contractor
Plant	Standby Generator plant
Point of Supply or connection	Point where the Plant connect and integrate to the existing Grid
DESCRIPTION	ABBREVIATION/INTERPRETATION
Project Specification	The Scope of Work (Part 3C) also serves as the Project Specification
Scope of Work or Works Information	The document that specifies and describe the Works which are to be provided, and any other requirements and constraints relating to the manner in which the work is to be carried out

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Site	The land and other places made available by the Employer, for the purpose of the Contract, on, under, over, in or through which the Works are to be executed
Similar or Equal	Equal or better in efficiency or performance and compatibility with the installation as specified
Specification	The complete Tender Document including the Scope of Work
Subcontractor	Sub-contractors appointed or utilised at the full responsibility of the Contractor
Starting Date	The date that the Agreement, made in terms of the Form of Offer and Acceptance, comes into effect (is signed)
Successful Tenderer	The Tenderer appointed as Contractor
Supply	To purchase or procure and deliver complete with all necessary and additional specified accessories
Turnkey project	Project designed, supplied, installed and commissioned by Contractor
Works	The Permanent Works together with such Temporary Works as may be necessary for the execution of the Works and including provisional cost items

Contractor's Responsibility

This document sets the general technical requirements for the Design, Supply, Construction, Commissioning and Maintenance during the Defects Liability Period for the Generator Installation, to be established by the Contractor after approval by the Project Manager.

The design definitions and guidelines, plant performance requirements, quality management and minimum codes and standards, but not limited to, forms part of this document.

It is the responsibility of the Contractor to deliver a working system, complete with all the legal required certification, to the Employer.

All materials supplied must carry a guarantee and warrantee and be new. The installation must comply with this Specification and the Standardised Specifications (refer to C3.4: Applicable Standards). Workmanship must be of the best quality and be carried out in accordance with the Occupational Health and Safety (Act 85 of 1993).

The Specification, Drawings and Bill of Quantities show the general nature of the work and not all details are shown. The responsibility lies with the Contractor to provide for all equipment and materials in order to furnish a complete functional installation.

Over and above the compulsory site inspection or clarification meeting, prospective Tenderers must visit the site and must make sure of the circumstances of the site. No claims due to lack of knowledge in this regard will be entertained after appointment of the successful Tenderer.

ACSA's Objectives
ACSA's main objectives for the installation are as follows:



To ensure a reliable electrical supply to the airport's critical equipment in case of electricity outages to ensure the continuous operation of the airport.

Statutory Requirements Specifications and Standards
The construction activities and final Works shall comply with the statutory requirements as amended to date and relevant guidelines and regulations, inter alia:

The Occupational Health and Safety (Act 85 of 1993).
Environmental Conservation Act (Act 50 of 2003).
Civil Aviation Act (Act 13 of 2009)
Municipal bylaws and regulations.
Standards and Specifications of the ACSA.
Standards and Specifications of the Supply Authority.
Applicable relevant standards and codes of practice, whether BS, IEC, NRS or SANS.

Conflict Between Specifications and Drawings
Should there be conflict between the Specifications and the Drawings then Parts shall be considered in the following order of priority:

Scope of Work (Project Specification)
Bill of Quantities
Drawings
Generic Specifications
Standard Technical Specifications

Should the Contractor note an inconsistency between various Parts and Sections of the Document, the Contractor shall be responsible to notify the Employer and obtaining clarification or instructions prior to ordering or installing equipment.

Items Requiring Special Attention
As the work progresses, the Contractor shall keep an accurate record of any variation or deviation from the original design and drawings submitted by the Contractor and approved by the Project Manager. Marked up interim as built drawings shall be submitted in this regard.
Before the issue of the Completion Certificate of the project the project manual complete with test certificates and a set of co-ordinated "As Built" drawings must be handed over to the Project Manager.

It is important to note that the Completion and start of the Defects Liability stage is not reached until such completion documentation is in the possession of the Employer.

Final Contract payment at Completion stage will not be certified unless the required completion documentation has been submitted to the Employer.

All test certificates of the various manufacturers/suppliers as well as site test certificates must be provided to the Engineer before equipment and or material will be accepted.

Labour
It is the intention of the Employer that the project, of which this Contract is a part, must make the maximum possible use of the local labour force. To this end the Contractor shall limit the use of non-local staff to key personnel only and is to employ local labour on this Contract. The Tenderer must state in the schedule's details of non-local (outside NMBM) labour and supervisory staff that the Contractor intends using on this contract.



Note that labour from Labour Brokers are not allowed on the Contract.

Training
The Contractor shall be responsible for the operation and maintenance training of Employer staff as indicated in the Bill of Quantities.

Occupational Health and Safety Act (Act 85 of 1993)
The Contactor shall meet the health and safety requirements as stipulated in health and safety plan specification.

The Contractor shall be obliged to sign an Occupational Health and Safety Mandatory agreement as per the pro-forma agreement.

It is confirmed that the Contractor will not act as agent for the Employer as contemplated in Section 4.5 of the Construction Regulations, promulgated in terms of the Occupational Health and Safety Act 85 of 1993. A suitably qualified competent person shall be appointed by the Employer to undertake the responsibilities of the Employer as laid down in these Regulations.

Construction Regulations
All aspects of the Construction Regulations 2014 shall apply to the Contract.

Particular attention shall be given to the following to the following Clauses:

Regulation 5 (1)(j): That die Employer shall ensure that the Contractor is registered and in good standing with the compensation fund or with a licensed compensation insurer as contemplated in the Compensation for Occupational Injuries and Diseases Act, 1993 (Act No.130 of 1993).

Regulation 5 (1)(a) & (b): The Employer shall prepare a baseline risk assessment for the intended construction work and prepare a suitable, sufficient documented and coherent site-specific health and safety specification for the intended construction work based on the baseline risk assessment.

Regulation 5 (1)(g): Adequate provision for the health and safety measures must be made by the Contractor under the item allowed for this purpose in the bill of quantities, Part C2.3.

Regulation 5 (1)(l): The Employer shall discuss the Contractor’s health and safety plan contemplated in Regulation 7 (1) and must thereafter finally approve that plan for implementation.

Regulation 7 (1)(a): The Contractor shall submit a suitable, sufficient documented and coherent health and safety plan based on the Employers requirements, which plan must be applied from the date of commencement of and for the duration of construction work.

Safety Procedure: Network Switching
Any switching of existing power and new supplies shall be arranged beforehand with the Responsible Person of the ACSA.

The Contractor shall not perform work on any portion of a network until such portions have been isolated and earthed.

The Contractor shall request a written "Work Permit" from the Responsible Person, which shall be completed in duplicate. The original "Work Permit" shall be retained by the Contractor until completion of his work. Upon completion of the work, the Contractor shall sign a statement to this effect. He shall hand this statement, as



well as the used "Work Permit" to the Responsible Person, to enable the latter to re-energise the relevant portion/portions of the network.

Only ORHVS certified persons shall be allowed to do switching.

Schedules to be Completed
All schedules included in this tender document including the Returnable Technical Schedules in Part C15 must be completed.

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PART C3.2: TECHNICAL REQUIREMENTS

Standard Technical Specification for Emergency Generators

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C3.2.1 GENERAL

This specification specifies the standard requirements for the generator installation. The specific requirements for the project are specified in Project Specifications.

C3.2.1.1 DEFINITIONS

The definition of the General Conditions of Contract shall apply to all sections of this Specification.

C3.2.1.2 MULTIPLE SETS

This specification describes one generator set with related equipment. Should more than one generator set be required all the requirements specified herein shall be applicable to every set required.

C3.2.1.3 DEVIATIONS FROM THE SPECIFICATION

Tenderers must submit with each tender offer a clear and detailed description of any characteristics of the offered generator set not complying in all respects to the specification. The relevant paragraph in the specification must be referred to with a short description detailing the extent and type of deviations from the specification.

C3.2.1.4 REQUIREMENTS AT VARIANCE

Tenderers must note that this standard specification is a general specification determining the general standard and requirements for the generator set required. The specific detail requirements, to which the generator set must comply, are detailed in the Project Specification. In cases where the respective requirements are at variance, the requirements of the Project Specification must be adhered to.

C3.2.1.5 CODE SYMBOLS

To facilitate easy and coordinated administration of the project, code symbols in the text of the specification are used. Paragraphs and/or sub paragraphs requiring attention at different stadiums during execution of the contract are marked with different code symbols. Before the contractor requires the consultant engineer to carry out certain tests or inspections, the contractor must make sure that all the relevant items to which the installation must comply at that stage of completion, have been fully completed. Should the contractor fail in this requirement all fruitless expense incurred by the engineer as a result, regarding time and travelling costs, will be to the contractor's account.

The respective code symbols, and the stage at which compliance to items so marked is required, is as follows :

AAA Submission and adjudication of tenders.

BBB Inspection and testing of the generators at the premises of the manufacturer, before delivery thereof to site.

CCC Inspection and testing of the generators at site, after completion of the installation.

DDD Final inspection and testing of the generator set after expiry of the contractual maintenance period and before retention monies are paid out.

Items of general nature, although in no way less important, are not identified in this way.

C3.2.1.6 VISIT TO SITE

AAA Tenderers must visit the site and satisfy themselves regarding site conditions, access to, size and position of site, availability of labour, labour conditions, transport, loading and unloading areas, storage areas and security of stored material, workshop areas, scaffolding, cranes, and all equipment required for the erection of the installation, since no additional claims regarding any such items will be entertained. Should an official site inspection be arranged during the tender period, all prospective tenderers must attend since this may be the only occasion where additional tender requirements are made known.

C3.2.1.7 INFORMATION SCHEDULES

AAA The tenderer must note that, should the information schedules forming part of the tender document, not fully filled in, or if he fails to submit any other information required with his tender offer, his tender may be disqualified.

C3.2.1.8 MAKING GOOD

CCC The contractor must keep the site neat and clean, and all rubble must be removed after completion of the installation.

C3.2.1.9 SUPERFLUOUS MATERIAL

CCC All superfluous materials and equipment remains the property of the client, and must be handed over to the Client or his representative.

C3.2.1.10 STATUTORY REQUIREMENTS

The installation must be completed in its entirety in full compliance with the following, where applicable :

The latest issue of "Code of Practice for the Wiring of Premises", SANS 0142.

The "Occupational Health and Safety Act" as amended.

The Minerals Act no 50 of 1991 including the Mines and Works Regulations.

The local Municipal bye-laws and regulations as well as the local supply authority's regulations.

The local fire regulations.

The Telkom regulations.

In additions the contractor must issue all notices and pay all the required fees in respect of the installation to the local authorities and shall exempt the client from all losses, costs or expenditures which may arise as a result of the contractor's negligence to comply with the requirements of the said regulations. It shall be assumed that the contractor is conversant with the abovementioned requirements. Should any requirement, bye-law or regulation, which contradicts the requirements of this document, apply or become applicable during erection of the installation, such requirement, bye-law or regulation overrules this document and the contractor must immediately inform the engineer of such a contradiction. Under no circumstances shall the contractor carry out any variations to the installation in terms of such contradiction without obtaining the written permission to do so from the engineer.

C3.2.2 SCOPE OF THE WORK

The work to be carried out includes the following:

The supply, delivery, installation, testing and commissioning of the generator sets and related equipment according to specification, within the tendered contract time.

(2) The supply, delivery, installation, connecting, testing and commissioning of the control board, fuel piping, cables, air louvres and/or ducting, as specified.

(3) The supply, connecting and use of all test equipment, switch gear and fuel necessary to carry out the tests procedures described herein, or as offered by the tenderer. All test equipment remains the property of the successful tenderer.

(4) Employ the services of a specialist sub-contractor to carry out the work as indicated below pertaining to the decommissioning of the existing underground fuel tank and the installation of a new above ground fuel tank.

Conduct necessary Risk Assessments according to ACSA Specifications.
Decommission existing 9m³ UST and fill with slurry.
Abandon all underground pipes coming from existing tank to feeder tanks.
Supply and install 1 x 9m³ AST.
Supply and install 2 x Feeder tanks.
Supply and install remote filler box for filling of new AST.
Supply and install all pipe work from new AST to day tanks.
Supply and install pipe work from remote filler point to new AST.
Remove existing pumps x 2.
Supply and install 2 x pumps for feeder tanks.
Disconnect electrics from pump and reconnect to new ones.
Supply customer with log off details.
Sign off job card next to dealer signature.

(5) The supply and delivery of all spare parts, tools and manuals specified.

(6) Comprehensive maintenance and guarantee of all equipment for a period of 12 months after the date of completion of the installation.

(7) The supply and use of all materials and equipment not specifically detailed in this document, but required to complete the contract in terms of this document and all other authority's requirements and codes of practice applicable to this installation.

(8) The design and construction of a new fuel tank room as indicated on the drawings.

(9) Interfacing of the generator system to the existing SCADA system.

(10) Interfacing of the generator system to the PV plant being constructed at the airport.

C3.2.3 GENERAL TECHNICAL REQUIREMENTS

C3.2.3.1 OPERATIONAL REQUIREMENTS

BBB The generator set must be fully automatic, it must start as soon as the mains supply is interrupted and must disconnect the emergency load automatically from the mains supply and reconnect it to the emergency supply and continue supplying the load with emergency power for an adjustable time period after the mains supply is restored, and re-connect the emergency load to the mains supply, and carry on running for a further period for cooling down, at no load, before automatically stopping to be ready again to start automatically should the mains supply be interrupted once again.

C3.2.3.2 CAPACITY

The set must have sufficient capacity to supply the electrical load continuously at the specified site conditions without overheating or incurring detrimental effects in terms of the equipment manufacturer's instructions. In addition the generator set must be capable of delivering an output of 110 % of the specified electrical load under any site conditions, in accordance with requirements, for any one hour period during a twelve hour operating period.

C3.2.3.3 LOAD ACCEPTANCE

BBB The generator set must be capable of accepting 70 % of the specified full load immediately and in one step and thereafter the remaining 30 % of the load within 10 seconds after starting, without exceeding the prescribed voltage and frequency limits.

C3.2.3.4 PROTECTION

The set must be automatically self-protecting against damage resulting from abnormal ambient and/or load conditions, failure of components or electrical fault conditions.

C3.2.3.5 MACHINE ROOM

Unless otherwise specified, the generator set must be installed in a machine room supplied by others for this purpose. No other equipment shall be housed in the machine room.

C3.2.3.6 VOLTAGE AND FREQUENCY LIMITS

The generator set must automatically take over the supply to the emergency load as soon as the voltage and/or frequency of the mains supply exceeds the following limits for longer than the period prescribed:
Voltage : + 10 % or - 10 % of the nominal no-load voltage for 10 seconds or longer.

Frequency : Less than 48 Hz and more than 52 Hz for 0,1 seconds or longer.

C3.2.3.7 POWER FACTOR

AAA All information submitted regarding the ability of the generator set must be based on a lagging power factor of 0,8.

C3.2.3.8 MECHANICAL SYSTEM

The contractor is responsible to ensure that the respective rotating components comprising the dynamic system are sufficiently matched that mechanical vibration stresses resulting from critical torque and resonance, do not reach detrimental proportions.

C3.2.3.9 REGULATION

BBB Notwithstanding the fact that the regulation of the engine and alternator are determined by publications BS 5514, BS 4999 and BS 5000 respectively, the nett electrical output characteristic of the set must comply with the specified requirements when the complete set is tested in accordance with the specified test procedures.

C3.2.3.10 MOVING COMPONENTS

CCC All dangerously moving components must be screened off with sturdy, easily removable screens of sheet steel or expanded metal in accordance with the applicable regulations.

C3.2.3.11 TENDER INFORMATION

AAA Comprehensive detail, manufacturer's performance curves, tables and illustrations of the equipment offered must be submitted with every tender offer.

C3.2.3.12 EARTHING

The housing of the alternator, the engine and all parts of the mounting frame must be electrically interconnected.

CCC The star point of the generator must be solidly earthed to the earth busbar in the control board with a copper earth conductor of sectional area at least 50 % of that of the current carrying conductors. The earth conductor need never be greater than 70 mm2 in cross sectional area.

C3.2.4 INSTALLATION REQUIREMENTS

CCC (1) Appearance of the installation

The general appearance of the installation must be neat with all finishes and fixings indicating a high quality of workmanship.

CCC (2) Correcting bad work

Should the engineer find any part of the installation not acceptable, the contractor must correct the same at his cost or replace the rejected part to the engineer's requirements.

C3.2.5 ENGINE

C3.2.5.1 TYPE AND CHARACTERISTICS

The engine must be a pressure ignition, fuel injection industrial four-cycle or two-cycle diesel engine.

(2) The engine may be air or water cooled, turbo charged or naturally aspirated.

C3.2.5.2 ENGINE OUTPUT

AAA (1) The nett engine output under the most adverse ambient conditions must be strictly determined in Terms of SANS 5514 of 1979, as amended.

AAA (2) Should use be made of any other calculation method, such method must be motivated in Detail and is subject to the approval of the engineer. Full details of such calculation methods must be submitted with the tender offer.

BBB (3) The derating of the engine output to compensate for ambient conditions must be guaranteed by the successful tenderer and proved during the tests.

(4) The engine output must be calculated when diesel fuel complying with the minimum requirements for commercial diesel fuel marketed in the RSA, is used.

C3.2.5.3 STARTING

The engine must start easily without any use of special equipment to assist starting.

The starter motor must be controlled from the control board and must be powered by the starter battery.

The electrical starter of the engine must be designed so that the drive gear automatically disengages as soon as the starter motor is driven by the engine. This bendix mechanism must be of robust and proven type.

BBB (4) The start up time in either automatic or manual control mode must not exceed 10 seconds from the time the start signal is given until the generator set accepts the full specified electrical load, subject to the engine starting at the first attempt.

BBB (5) The starter motor must be activated for an adjustable period of 5 to 10 seconds immediately after the start signal is given. After an adjustable pause of 5 to 10 seconds, the starter must be engaged once again. After three such unsuccessful start attempts, the start control must automatically switch off and the "set fail" alarm must be activated.

C3.2.5.4 GOVERNOR

BBB Unless otherwise specified, the governor must regulate the engine speed in accordance with class A2 regulation per BS 5514 of 1979 as amended, with nominal speed of 1500 r.p.m.

C3.2.5.5 AIR FILTER

BBB (1) The air intake filter must be of the heavy duty dry type. The capacity of the filter must sufficient to ensure 200 hours operation without attention in the ambient conditions expected at the site.

The filter must be equipped with a differential pressure indicator, clearly indicating when the filter requires attention.

The air filter must be of the easily serviceable, clip-open type.

C3.2.5.6 FLY WHEEL

The engine must be provided with a fly wheel with sufficient inertia to ensure that the cyclic irregularity of the engine is kept within the limits specified in the BS 5514 of 1979, as amended.

C3.2.5.7 WIRING

BBB The insulation material of all wiring must be suitable for continuous service at the ambient temperature encountered during normal operation of the generator set. The positions where the ambient temperature may exceed 70□C all wiring must be silicon rubber insulated.

C3.2.6 GENERATOR

C3.2.6.1 TYPE

BBB The generator must be a self exited brushless, four pole, 400/231V, 50Hz, 3-phase alternator, complying with the applicable requirements of BS 4999 and BS 5000 specifications.

The generator must be of the two bearing type equipped with ball or roller bearings. The bearings must be pre-lubricated to ensure long service periods without attention. Single bearing machines may be offered.

The generator must be equipped with semi-conductor rectified self-excitation and a semi-conductor automatic adjustable voltage regulator. The output voltage must at least be adjustable between - 10% to + 10% of the specified nominal value.

Output

AAA (1) The generator must, in accordance with the manufacturer's requirements, capable of delivering the prescribed full load continuously, as well as 10% overload for any one hour period in a twelve hour operation period during which the temperature rise must not exceed the maximum specified in BS 5000, taking in account the possible ambient conditions specified for rotating machines with class B insulation (130□C). The insulation class of the offered machine must at least comply with the requirements of class F insulation (155□C).
The classification of insulation must be in accordance with the BS 2757 as amended. The rating of the alternator must be strictly determined in accordance with BS 4999 and BS 5000 taking into account the most adverse ambient conditions.

(2) The generator must be equipped with damper windings, enabling the unit to accommodate an unbalanced load of at least 25% of full load at any load and at the normal operating conditions without incurring any damage.

C3.2.6.2 EXCITATION AND REGULATION

BBB (1) The generator regulation must comply with the regulation class VR 2.31 as defined in BS 4999, Part 40, 1972.

The voltage regulation must be better than ± 2½ % of the nominal voltage at all load Conditions and with any power factor between 1 and 0,8 lagging and with engine speed variations of up to 5%.

During 25% of full load unbalance conditions, the regulation need not comply with the above, but it must not exceed ±5% of the nominal voltage at a power factor between 1 and 0,8 lagging and engine speed variations of 5% between 0% and 100% of full load.

The voltage regulating system must be able to restore the output voltage to within 3% of the nominal value within 1,5 seconds after full load is suddenly applied. The transient voltage drop may not exceed 15% of the nominal value.

The excitation voltage must be obtained from a rotor mounted 3-phase alternator and a rotating full wave diode rectifier bridge. A semi-conductor automatic voltage regulator must control the exciter field current. The inherent damping of the exciter must limit overshoot and resonance.

The alternator design must ensure sufficient inherent loss of excitation to protect the machine against damage under short circuit conditions.

C3.2.6.3 CONNECTIONS

BBB (1) The generator windings must terminate on stud bolts mounted in a suitable terminal housing with a removable cover plate. The terminal housing must be large enough to facilitate the comfortable termination of the cable size specified.

CCC (2) The cables must enter the terminal box neatly and next to each other from the side where the cable duct or cable tray is provided.

CCC (3) Should the standard terminal box of the alternator not comply with these requirements an additional terminal box must be supplied to comply.

C3.2.6.4 WAVEFORM

BBB The alternator output waveform must comply with the requirements of BS 4999 : Part 40, par. 40.6.1.1.

Although these requirements are said to be applicable to units larger than 300kVA, they will, for the purposes of this specification be read as being also applicable to smaller units.

C3.2.7 COUPLING

The engine generator must be directly coupled through a shock absorbing coupling.

C3.2.8 MOUNTING

100kVA sets and larger

BBB (1) The mounting base must be of the duplex type, consisting of two separate steel frames sized so that the one fits within the other.

(2) The inner frame must be fixed to the outer frame with vibration mountings installed at an angle of 45º to the horizontal. The mountings must be large enough to bear the weight of the fully mounted set.

(3) The engine and the generator must be mounted solidly on the inner frame.

Sets smaller than 100 kVA

The mounting base may be of the uniflex type consisting of a single steel frame with the engine and alternator directly mounted thereon on vibration mountings. In this case the engine and generator must be solidly bolted together to form a unit.

General

The outer frame must not be bolted on the floor.

The outer frame must be manufactured in the form of a sledge with lifting holes to facilitate transport and/or moving of the set.

The mounting base as a whole must be designed to :

withstand any bending loads applied to the engine block, coupling and generator frame,

withstand torsion and bending moments caused by engine torque; and

prevent resonating vibration at the normal operating speed.

(4) All cross members must clear the floor by at least 50mm to facilitate the easy installation and removal of a drip panel.

The cross members of the frame must preferably not be of concave sections. Should this be the case, each cross member must be drilled in at least three positions to ensure that fluid will drip into the drip pan.

C3.2.9 SERVICE CONNECTIONS

CCC (1) All service connections between static and vibrating sections must be flexible.

All service connections to and from the set must be of a heat resistant type where applicable or must be protected sufficiently against damage resulting from heat or mechanical abrasion.

Electrical connections to and from the engine must consist of silicon rubber insulated copper conductors.

The crank case breather pipe must terminate directly above the oil drip pan.

Rigid fuel pipes must all be of copper and must be neatly installed and firmly fixed.

All electrical connections must be neatly made in accordance with standard practice. Conductors must terminate in suitable cable lugs and/or glands. Groups of conductors must be contained in a suitable duct.

Unless specified to the contrary, the supply, installation and connection of all electrical cables and other services between the respective components of this installation forms part of this contract. The termination and connection to the distribution board of all incoming and outgoing cables supplied and installed by others also forms part of this contract.

C3.2.10 CONTROL AND DISTRIBUTION BOARD

C3.2.10.1 GENERAL

An integrated control and distribution board, separate from the generator set and fully equipped with all equipment necessary for the control and protection of the generator set, automatic mains transferring, battery charger, alarms and switchgear for outgoing supplies, must be supplied and installed in the generator room.

C3.2.10.2 DRAWINGS FOR APPROVAL

BBB The contractor must submit three paper prints of each working drawing to the engineer for his written approval before commencing with the manufacture of the board. These drawings must clearly show:

a complete circuit diagram of all equipment on the board,

(2) a complete layout with dimensions, showing the relative sizes, spacing and position of equipment and the general construction of the board, and

(3) positions and the fixing method of busbars.

C3.2.10.3 CONSTRUCTION

BBB (1) The board must consist of separate sections, separated by sheet metal bulkheads to accommodate power distribution, control and bypass switchgear respectively, as applicable.

BBB (2) The board must be a totally enclosed free-standing unit without doors. The boards must not stand higher than 2,3m above floor level and must be sized to fit in the space provided for it.

CCC (3) The board must be vermin-proof, dust-proof and drip-proof to at least comply with class IP41 of IEC 144 protection.

CCC (4) Welded joints must be ground smooth.

AAA (5) The contractor must fully acquaint himself with the limitations on access to the generator room. To facilitate easy transport and installation of the board in the generator room, the board may be manufactured in separate sections. Each section must fit through the access doors and passages and must be strong enough to avoid damage during transport. The respective sections must be securely bolted together after installation.

(6) Cable gland plates of sufficient size and strength to accommodate the Specified cables to the board must be provided at the top and / or bottom of the board as required. The lower cable gland plate must be situated at least 400mm above the base or floor level

(7) The side panels must be made of 2mm thick and stiffened sheet metal.

(8) Machine punched holes for the installation of additional circuit breakers must be provided. These holes must be temporarily covered with steel cover plates, painted to match the board.

(9) The front panels must be hinged to the frame and must be designed to suite the required grouping of equipment as required and in accordance with the positions of busbars.

(10) The edges of the front panels must be bent over by 20mm to fit over a projecting lip on the board frame work. Alternatively the panels must have bent-over edges to fit flush into the front face of the frame work.

(11) Each hinged panel must be provided with a chrome plated handle.

C3.2.10.4 WIRING

BBB (1) Wiring must consist of PVC insulated conductors, neatly grouped in horizontal and vertical bundles and contained in suitable plastic channels. The size and number of wiring channels provided must be sufficient to avoid adverse interheating in large groups of conductors.

All wiring must be kept away from un-insulated terminals or live parts.

The board must be completely wired in the factory. All external control and interlocking connections to the board must terminate on a suitable terminal strip.

The current rating of conductors used in internal wiring must be sufficient for the current and each relevant circuit. The ratings must comply with the requirements of the standard regulations with the prescribed grouping factors taken into account.

The colours of insulated conductors for alternating current must co-incide with the phase colours of the supply. All control and other circuits must be suitably colour coded throughout.

All control wiring must be grey, and the end of each conductor must be numbered. The number must be stamped on a plastic ring fitting over the end of conductor. The terminals to which the conductors are connected must be numbered independently of the conductor number with the same number as that of the conductor connected thereto.

CCC (7) The colour codes and conductor numbers must be clearly shown on the wiring diagrams.

C3.2.10.5 BUSBARS

BBB (1) Busbars of solid copper with a minimum sectional area of 6mm x 18mm must be installed for each phase and neutral conductor and must be mounted on suitable insulators.

The current density in busbars must never exceed 1.8Amp per mm².

An earth busbar of 70mm² minimum sectional area must be provided over the entire width of the board.

(4) Each busbar must be covered over its entire length with a double layer of PVC insulated tape or plastic shrink on material, of colour in accordance with the relative phase colour.

(5) All cables connected to busbars must be provided with suitable lugs securely bolted to the busbar with cadmium plated steel bolts and washers. Three spare bolts, complete with washers and nuts, must be provided on each busbar in a suitable position to facilitate future connections.

(6) The spacing between adjacent busbars must be at least twice the length of the greatest sectional dimension, but never less than 50mm. Busbars must be installed at least 150mm away from the nearest equipment.

(7) The mounting, insulation and rating of busbars must be suitable for the system voltage and short circuit capacity.

C3.2.10.6 EQUIPMENT

C3.2.10.6.1 Access

BBB Direct access to all equipment and wiring must be facilitated by only the removal of the front panels of the board. Access to any piece of equipment must not be obstructed by any other equipment, bracket or wiring.

C3.2.10.6.2 Spacing

The following requirements regarding the spacing of equipment must be strictly adhered to:

A minimum of 100mm between any equipment and the frame or internal bulkhead must be maintained.

A minimum of 100mm between horizontal rows of equipment. The maximum dimensions of the equipment must be taken into account and not only that of the sections protruding through the front panels.

Single and double pole circuit breakers up to 60A and triple pole circuit breakers up to 30A may be installed directly adjacent to each other.

Free space of at least 40mm on either side of circuit breakers and isolators rated at not more than 100A must be maintained. A minimum of 75mm must be maintained on either side of larger circuit breakers and isolators and any other equipment.

All other equipment must be sufficiently spaced to allow for the minimum bending radius of the conductors to be connected thereto.

(6) Sufficient space must be allowed for the installation of future equipment as prescribed.

(7) The spacing allowed must be sufficient to facilitate the easy and neat connection of cable ends and wiring of current rating equal to that of the equipment it is to be connected to.

C3.2.10.6.3 Grouping of Equipment

Equipment in the board must be arranged in logical groups. The working drawings to be submitted for approval before manufacture must detail the grouping clearly and, should the engineer so instruct, be are-grouped to his requirements.

C3.2.10.6.4 Mounting of Circuit Breakers

All moulded case circuit breakers must be mounted flush in the board so that only the operating handles project through the front panel. Circuit breakers and isolators must be installed so that the operating handle points upwards for the "ON" position and downwards for the "OFF" position, throughout.

C3.2.10.6.5 Mounting of Contactors

Contactors must be directly mounted on the board frame and behind the front panel. No plastic or other type of dust shields are required.

C3.2.10.6.6 Mounting of Instruments

All ammeters, volt meters and frequency meters and other instruments must be flush mounted in a hinged front panel. The rear of these instruments must be covered with a removable lid of suitable non-conductive material screwed to the panel so that the terminals of the meters cannot be inadvertently touched while the door is open. Fuses for the protection of the instruments must be mounted in a suitable place behind the front panels and must be clearly labelled to denote their function.

C3.2.10.6.7 Mounting of Fuses

Fuse holders containing fuses that form part of the power distribution must be mounted semi-flush in the front panel with the fuse holder handle protruding sufficiently to facilitate easy removal thereof without opening or removing the panel. Control fuses may be located inside control panels.

C3.2.10.6.8 PAINT FINISH

BBB Care must be taken that all corners, edges and inaccessible areas are sufficiently covered. The paint finish must comply with the standards and thickness prescribed elsewhere herein.

C3.2.10.9 COLOUR

BBB The colour of the board must be Electrical Orange. The inside of the board may however be white.

C3.2.11 EQUIPMENT IN CONTROL AND DISTRIBUTION BOARD

Supply and install the following equipment in the respective sections of the board. The equipment lists given below are not necessarily complete and serve only as a guide regarding the required grouping of equipment. Any other equipment necessary for compliance with the required functions of the set, must be supplied and installed.

The required sectionalization of the board must be strictly adhered to. Grouping together of e.g. light and heavy current equipment will not be acceptable.

C3.2.11.1 LIGHT CURRENT CONTROL SECTION

BBB The following equipment must be installed in the light current control section of the board:

(1) Control circuit, switches, control relays and semi-conductor components.

(2) Four position selector switch to select the control function.

(3) Sensor units for mains voltage, alternator voltage and alternator frequency.

(4) Two push buttons, red and green respectively, for the manual start and stop functions.

(5) Battery charger with related equipment and instruments.

(6) Alarm indication and alarm reset push button.

(7) Lamp test push button.

(8) Labelled screw terminals for all outgoing control wiring.

C3.2.11.2 ALTERNATOR SWITCHGEAR SECTION

BBB The following equipment must be supplied and installed in the alternator switchgear section of the board :

(1) Alternator supply main circuit breaker.

(2) Six pole change-over switch.

(3) Current transformers for alternator supply instruments.

(4) Busbars.

(5) Cable gland plate for the termination of alternator supply cable(s).

(6) Labelled screw terminals for outgoing control wiring.

C3.2.11.3 DISTRIBUTION SECTION

BBB The following equipment must be supplied and installed in the distribution switchgear section of the board:

(1) Main circuit breaker for mains supply.

(2) Six pole by-pass switch.

(3) Current breakers for all circuits as prescribed.

(4) Current transformers for mains supply instruments.

(5) Busbars.

Cable gland plate for the termination of the mains supply and outgoing circuit cables.

C3.2.11.4 LIGHT CURRENT EQUIPMENT

BBB (1) Tenderers may offer their standard equipment on condition that it complies in all respects with the operational requirements detailed in this document. Should such equipment deviate from the requirements, such deviations must be clearly pointed out in the tender offer. Should no such variations be documented, full compliance to the required operational functions shall be accepted and such compliance shall be contractually binding.

(2) The semi-conductor control unit must at least comply with the following requirements:

(a) The unit must consist of a sturdy base frame suitable for containing withdrawable plug in type printed circuit cards.

(b) The light current control relays must be mounted on the printed circuit modules.

(c) All control switches must be mounted on the base frame unit and not on the printed circuit cards.

(d) Printed circuit card contact strips and plugs must be of high quality with gold plated spring loaded contacts.

(e) The mounting of components on the printed circuit cards must be of professional quality.

(f) The modules must be interlocked to avoid faulty installation.

(g) All circuits must be designed fail-safe.

(h) All components must be rated conservatively and the unit as a whole must be adequately protected against lighting and switching surges.

C3.2.11.5 CIRCUIT BREAKERS

BBB The following circuit breakers must be provided, installed and suitably labelled in the heavy current section of the distribution board:

A three pole circuit breaker as main switch for the mains supply to the distribution board.

(2) A three-pole circuit breaker as main switch for the alternator supply to the distribution board.

All circuit breakers for the protection of the circuits related to the generator set, e.g. re-heaters, battery charger. These circuit breakers must be grouped together and labelled to denote their function.

Single and triple pole circuit breakers required in the detail specification as supply switches to the various outgoing supplies.

In single phase systems the main circuit breakers must be double pole units.

C3.2.11.6 CHANGE-OVER SWITCH

BBB (1) An automatic change-over switch must be provided in the alternator switchgear gear section of the control board. The unit may consist of two contactors or two motorized air circuit breakers, mechanically and electrically interlocked so that both units can simultaneously be opened but not closed.

Time relays must be provided in the interlock circuitry so that a time delay of at least 3 seconds is insured in the switch over function. After the first contactor opens, three seconds must elapse before the other is engaged. This time delay must be provided in both switching directions.

The change-over switch must interrupt all three phase conductors in three-phase phase systems and the phase conductor and neutral conductor in single phase systems.

C3.2.11.7 BYPASS SWITCH

BBB (1) Supply and install a manually operated bypass switch to connect the incoming mains supply to either the changeover switch or, alternatively, directly to the outgoing supply circuit as shown on the enclosed sketch.

The bypass switch must have only two positions, labelled as follows:

BYPASS STANDBY

Should the bypass switch be required with an off-position, this must be the centre position and must be labelled:

OFF

(3) The bypass switch must be mounted within the distribution section or in a separate section separated from the control section with sheet metal bulkheads so that no exposed live terminals are accessible within the control section without removing the panel to the bypass or distribution sections. The operating handle must protrude through the front panel of the board.

(4) The bypass switch must switch only the phase conductors and not the neutral conductor.

C3.2.11.8 VOLTAGE SENSORS

BBB Two identical, but separate, voltage sensor units must be supplied to monitor the mains and alternator supplies respectively. Each unit must comply with the following requirements:

It must be a semi-conductor type with two trip units respectively adjustable from 90% to 100% and 100% to 110% of nominal mains voltage.

The unit must trip after the voltage of any of the three phases exceeds the set high and/or low limits for longer than 5 seconds.

C3.2.11.9 FREQUENCY SENSORS

BBB Supply and install a frequency sensor unit to monitor the frequency of the alternator supply. The unit must be a separate semi-conductor type with two adjustable trip units, adjustable from 45 to 50 Hz and 50 to 55 Hz respectively.

The initial set points must be 48 Hz and 52 Hz respectively. The unit must trip within 0,25 seconds after the frequency exceeds any of these pre-set limits.

C3.2.11.10 INSTRUMENTS

The list of instruments below represents the minimum requirements for control board instrumentation. Any additional instrumentation necessary for the operation of the installation, must also be supplied. The types and quality of instruments is specified elsewhere.

The instruments must be sensibly arranged, labelled and grouped in the respective sections for generator set and mains supply instrumentation. Wherever applicable, instruments must be fuse protected.

BBB (1) Panel Lights

Six panel lights, coloured according to the phase colours, three each for the alternator and mains supplies respectively. The lights must be directly connected to the supply side of each main switch.

Labels : MAINS ALTERNATOR

BBB (2) Frequency meter to monitor the alternator output frequency.

Label : ALT.Hz

BBB (3) Ammeters

Six ammeters, to indicate the maximum demand and momentary phase current values of both the alternator and main supplies respectively.

Labels : R W B R W B
MAINS ALTERNATOR

BBB (4) Voltmeter

Two 0 - 600 Volt meters, each with a seven-position selector switch.

Switch labels : ALTERNATOR MAINS

Position labels : R/G, G/B, R/B, R/N, G/N, B/N, AF

BBB (5) Hour meter

An electrical cyclometer type running hour meter.

Labels : HOURS

CCC (6) Fuel content meter

A fuel content meter need only be supplied if a bulk fuel tank is required and such a meter is specifically required in the detail specification. The supply and installation of the sensor unit in the tank, as well as the connection thereof to the meter forms part of the instruction to supply and install such a meter. The meter must indicate the fuel content of the tank to ± 5% accuracy. The indication may be analogue or in steps but within the accuracy limit set above.

C3.2.11.11 EQUIPMENT RATING

BBB The current rating and short circuit rating of all equipment must be sufficient to comply with the system requirements. In cases where the equipment cannot comply, suitably designed back up protection must be provided.

C3.2.12 SET MOUNTED CONTROL EQUIPMENT

BBB The following equipment must be mounted on a suitable panel on the generator set. The panel must be mounted on the non-vibrating frame of the set and/or on suitable neoprene vibration mountings. The equipment must be labelled as indicated.

C3.2.12.1 KEY SWITCH

BBB (1) Supply and install an industrial type two position key switch. The key must only be removable in the OFF position. The two switch positions must be clearly labelled OFF and ON and the switch itself, MASTER CONTROL.

(2) With the key switch in the OFF position, it must be impossible for the set to be started from the control board regardless of the position of the control selector switch. Switching off the key switch while the set is in operation must stop the set immediately.

With the key switch in the ON position, all the required control functions must be in operation.

Label : ON/OFF
MASTER CONTROL

C3.2.12.2 INSTRUMENTS

BBB (1) An oil pressure meter with metric calibration indicating the pressure in the main oil duct to the oil filters.

Label : OIL PRESSURE

(2) A temperature meter calibrated in □C, indicating the temperature of the cooling water in water cooled engines and the temperature of a centrally situated cylinder head in air cooled engines.

Label : TEMP

(3) A DC-ammeter indicating the charge or discharge current of the engine driven battery charger.

Label : AMMETER

All the instruments must be clearly marked to indicate the normal operating range and the maximum and/or minimum available readings. The danger zone must be red in all cases.

C3.2.13 CONTROL OF THE SET

CCC Except for the activation of heavy current equipment, all control functions must be battery powered.

The respective control systems must be designed fail-safe without exception.

The required operational control function of the set must be selectable with a four position selector switch mounted on the front panel of the control board. The four respective positions of the switch must be clearly labelled as follows:

OFF AUTO MANUAL TEST

The required functioning of the control system in each of these control modes, with the bypass switch in the "bypass" position is as follows:

C3.2.13.1 OFF-POSITION

CCC (1) Both sections of the change-over switch must be opened.

(2) All alarm and control circuits must be de-energized and out of operation. The supply to the battery charger must however be maintained.

(3) It must only be possible to connect the electrical load to the mains supply by switching the by-pass switch to the bypass position.

C3.2.13.2 AUTO POSITION

CCC (1) Normal Condition

With the mains voltage on, the change-over switch must be switched so that the mains supply is connected to the load. All control and alarm circuits must be operational.

(2) Power Failure

As soon as the mains supply is interrupted or exceeds the preset limits of the sensor modules, an adjustable timer (0 to 60 seconds) must be activated.

Should the mains supply be restored before the time expires, the change-over contactor must immediately switch back to the mains supply.

Should the mains supply not be restored within the timer period, the time relay must initiate the start up cycle of the generator set. Restoration of the mains supply after this time must have no influence on the set until it has taken over the load or failed to start.

(3) Starting

CCC As soon as the start cycle of the set has been activated, all alarm circuits must be temporarily inhibited. Thereafter the prescribed three start attempts must be activated in succession. Should the set fail to start, the start cycle must be automatically terminated and a start failure indication given on the board.

Should the mains supply then be restored the change-over switch must reconnect the load to the mains supply after the prescribed 0 to 60 seconds delay.

Should the set start, the alarm circuits must be activated as soon as sufficient time has elapsed to allow the set to stabilize. The change-over switch must there-after be activated to connect the electrical load to the alternator.

(4) Stopping

As soon as the mains supply is restored, a 0 - 60 seconds adjustable timer must be activated. Should the mains supply remain restored for the timed period, the change-over switch must disconnect the load from the alternator supply and re-connected to the mains supply. Hereafter a 0 to 5 minute timer must be activated. For this period the set must remain running at no load to cool down. After this time period has expired the set must stop automatically to be read once again in the standby mode.

(5) Trip

Should a fault condition arise while the set is in operation, it must trip automatically and the change-over switch disconnect the alternator from the load immediately so that the set does not run down while connected to the load.

C3.2.13.3 MANUAL POSITION

CCC With the selector switch in the manual position it must be possible to stop and start the set by activating the stop and start push buttons on the control board.

Should the set be started manually, the change-over switch must automatically connect the load to the alternator as soon as the change-over time delay has expired.

All alarm and protection circuits must be in operation.

C3.2.13.4 TEST POSITION

CCC With the selector switch in the test position, it must be possible to :

stop and start the set by means of manual control but without the change-over contactor operating,

(2) run the set without taking over the load, and

(3) all alarm and protection circuits remaining in operation.

C3.2.14 ALARMS AND PROTECTION

C3.2.14.1 GENERAL

CCC (1) The generator set must be automatically protected against damage resulting from fault conditions which could normally occur in the installation during normal operation by means of automatic alarm circuits activated by suitable sensors.

(2) The alarm system must indicate a fault condition clearly to facilitate quick diagnosis and repair.

AAA (3) Should the nature and extent of the prescribed protection facilities described herein, be advisably extendable in the opinion of the tenderer, the tenderer must submit such recommendations in writing with his tender offer. This extension of protection facilities must be offered as an alternative tender offer.

C3.2.14.2 ALARM AND PROTECTION CIRCUITS AND SENSORS

Provision must be made for the following protection and alarm circuits. The wording of related labels for identification purposes is given in capital letters in each case.

(1) Low Engine Oil Pressure

CCC The sensor must monitor the oil pressure directly in the oil way to the engine bearings so that a blocked oil filter will also cause alarm indication. The sensor must be of a proven type recommended by the engine manufacturer.

OIL PRESS

(2) High Engine Temperature

CCC Air cooled engine:

Supply and install at least two semi-conductive type sensors to monitor the temperature of at least two separate cylinder heads. The sensors must be in accordance with the recommendations of the engine manufacturer and must activate the alarm circuit separately and/or jointly within 30 seconds after the temperature exceeds the set limit. The trip point must be easily adjustable with the normal working point approximately in the middle of the adjustment range. The adjustment must be calibrated.

Water cooled engine:

Supply and install a temperature sensor in a strategic position to monitor the temperature of the cooled water within the engine block. The sensor must comply with the recommendations of the engine manufacturer.

The sensor must operate jointly with or separately from the low water level sensor described below within 30 seconds after the temperature exceeds the set limits. The trip point must be easily adjustable with the normal work point situated approximately in the middle of the adjustment range. The sensor must be easily accessible and removable for maintenance and test purposes.

TEMP. HIGH

(3) Low Water Level in Radiator

CCC This alarm circuit only applies to water cooled engines. The sensor must be of the static type and must monitor the water level in the upper radiator tank. The sensor must operate jointly with or separately from the water temperature sensor to trip within 30 seconds after the water level drops below the sensor.

Even though the temperature control unit may be activated by more than one sensor, there must be only single temperature high indication on the control board.

TEMP. HIGH

Engine Speed

CCC The sensor unit must monitor the alternator output frequency. It must be a separate semi-conductor unit with two trip circuits, adjustable from 45 to 50 Hz and from 50 to 55 Hz respectively. The unit must trip within 0,25 seconds after the frequency exceeds the set limits.

(5) Alternator Voltage

CCC Supply a composite semi-conductor type sensor unit with a low voltage trip adjustable from 90% to 100% and a high voltage trip adjustable from 100% to 110% of nominal voltage. The unit must trip should the voltage of any of the phases exceed the set limits for longer than 5 seconds.

VOLTAGE

(6) Over current

CCC This alarm must only be activated by an auxiliary contact to the alternator circuit breaker in case it trips on over load or a fault condition.

OVERLOAD

(7) Start Failure

CCC This alarm must trip immediately should the generator set for whatever reason, refuse to start within the prescribed three start attempts.

START FAIL

(8) Day Tank Contents

CCC This alarm circuit must be activated as soon as the fuel level in the day tank falls below the prescribed minimum level. The sensor must be an easily removable static type.

DAY TANK

(9) Bulk tank contents (Only if required in detail specification)

CCC This alarm circuit must be activated as soon as the fuel level in the bulk tank falls to below the prescribed minimum level. The sensor must be an easily removable static type.

BULK TANK

The related control modules or printed circuits must be clearly labelled as specified to denote their respective functions.

(10) Battery Charger

CCC Provide an alarm circuit to trip as soon as the D.C. output voltage drops to 90% of the set value. The alarm circuit must be inhibited during a failure in the power supply.

BAT. CHARGER

C3.2.14.3 OPERATIONAL REQUIREMENTS

The abovementioned alarm and protection circuits must comply with the following operational requirements:

C3.2.14.3.1 Critical Alarms

CCC The activation of any of the alarm conditions listed under (1) to (6) inclusive above, must immediately stop the engine and activate full alarm indication as specified. The set must then not be able to start again before the alarm condition has been attended to and the alarm circuit reset.

C3.2.14.3.2 Non-critical Alarms

CCC The activation of any of the alarms listed under (7) to (10) inclusive above, must not stop the set when in operation but must give full alarm indication as specified.

C3.2.14.3.3 Alarms during starting

CCC All alarm circuits must be inhibited during the starting cycle of the engine until the engine has reached operational speed or has failed to start.

C3.2.14.3.4 Reset push button

CCC A reset push button must be provided on the control panel to reset any alarm indication to normal after the alarm condition has been attended to.

C3.2.14.3.5 Fleeting Alarm

CCC Should a fleeting alarm occur, the alarm circuitry must indicate it as a permanent alarm and the alarm system must operate as specified.

C3.2.14.4 INDICATION OF ALARM CONDITION

The alarm system must at least comply with the following requirements:

C3.2.14.4.1 Remote Alarm Indication

CCC A master alarm relay must be activated as soon as any of the abovementioned alarm conditions occur. This relay must also be reset to normal as soon as the alarm condition has been reset. One set of 5A change over contacts of this relay must be wired out to an easily accessible terminal block. The terminal block must be situated in a prominent position in the control board and must be labelled as follows:

REMOTE ALARM

C3.2.14.4.2 Control board indication

CCC Each alarm circuit must give a separate visual indication on the control panel by means of a LED indication light. The indication must be a battery powered panel light. The respective units must be labelled clearly as specified above.

C3.2.14.4.3 Hooter and red light

CCC In addition to the above alarm indication facilities, provision must be made for the installation of an electronic hooter equal or similar to the "KLAXON" type SY2/725 with continuous output of 110dB at a distance of two metres mounted together on the same bracket with a 40W flashing red warning light. This indication

unit must be battery powered and suitable for external use and be mounted directly below the roof eve on the outside surface of the machine room wall. The light and hooter must be switched on and off simultaneously depending upon the occurrence or cancellation of an alarm condition. The supply and installation of the cable to the unit from the control board forms part of this contract.

The supply to the unit must be protected by a 5 Ampere circuit breaker labelled as follows:

HOOTER

C3.2.14.5 SENSORS

CCC All alarm sensors must be easily accessible and removable for maintenance and/or test purposes. The required characteristics, operation and type of each sensor is specified in conjunction with the relevant alarm circuit described herein.

C3.2.14.6 POWER SUPPLY TO ALARM SYSTEM

CCC The entire alarm system must be battery powered and must remain operational during interruptions in the mains or alternator supplies.

C3.2.15 RADIO INTERFERENCE SUPPRESSION

CCC All radio interferences must be suppressed in terms of BS800 as amended. This requirement applies to the entire installation, inclusive of the alternator and related control systems, and also the equipment in the control board and emergency lights.

C3.2.16 EXHAUST SYSTEM

CCC (1) The entire exhaust system, inclusive of silencers, hangers, clamps, connections, bends and flashings form part of the installation.

The diameter of the exhaust pipe must be sufficient to ensure that the back pressure remains within limits. The radius of bends in the exhaust pipe must be at least 2,5 times the pipe diameter. The exhaust system must not depend on an extraction fan to reduce the back pressure.

The silencer must be a residential type. It must be mounted within the machine room, independently of the engine or exhaust pipe. The sound attenuation of the system must be at least 25dBA.

The exhaust pipe must be insulated with aluminium clad mineral wool lagging inside the generator room.

A section of flexible piping must be installed between the silencer and the engine. The connection must allow relative movement between the engine and the exhaust system, and thermal expansion of the exhaust system without causing stress at the exhaust manifold or silencer.

The exhaust pipe must be installed horizontally through an outside wall of the machine room and terminate outside with a 30 degree bend downwards to prevent rain water entering the system. The point of the exhaust pipe must project approximately 400mm past the roof eve.
The section of the exhaust pipe and related flashing outside the building, must be manufactured of stainless steel. The horizontal section of the exhaust pipe must be installed with a slight inclination so that condensate will drain outwards. The contractor must thoroughly seal and finish the point of exit of the exhaust pipe through the wall.

Should the exhaust system be exceptionally long and fixed at several positions, expansion connections must be provided between fixing points.

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INTERNATIONAL AIRPORT
AIRPORTS COMPANY SOUTH AFRICA

C3.2.17 VENTILATION, COOLING AND HEATING

C3.2.17.1 STRUCTURAL REQUIREMENTS

AAA While compiling their tenders, tenderers must take into account the required provision for cooling the generator set and/or ventilation of the machine room. Special structural requirements to install, accommodate and ventilate the set and related accessories, must be submitted with the tender offer in the form of fully detailed and dimensioned drawings.

C3.2.17.2 VENTILATION

AAA This contract includes the supply of all air louvres required to be installed in the walls and/or doors of the machine rooms. Where applicable the louvres must be delivered in time in accordance with the building program to the builder on site for building in thereof. It is the contractor's responsibility to see to it that the air louvres are installed in accordance with his requirements.

All air louvres in outside walls must be vermin proofed on the inside with 10mm galvanized mesh, securely fixed to the louvres.

C3.2.17.3 COOLING

The offered engine may be of the air cooled or water cooled type. Should the engine be a water cooled type, a pressure type reinforced fan cooled radiator must be provided.

Regardless whether a water or air cooled engine is offered, the supply and delivery of all air ducting within the machine room forms part of this contract.

The hot air from the engine must be lead to an outside louvre by means of a close-fitting hot air duct in such a manner that no serious hot air leakage can occur within the machine room.

The cold ventilation air must be drawn into the machine room through other air louvres. Care must be taken in the positioning of the respective louvres and exhaust outlet to ensure that hot air and/or exhaust gas cannot be drawn back into the machine room via the cold air inlet louvres.

The machine room design is based on the installation of either an air cooled or a water cooled engine. Should the layout not suit the engine being offered, the tenderer must allow in his tender price for all structural and/other adjustments.

C3.2.17.4 HEATING

BBB A thermostatically controlled heater must be provided in the cooling system of water cooled engine and in the oil sump of air cooled engines. The heater must be of sufficient rating to maintain the engine at such a temperature that it will start immediately and take load as specified even during the extreme lowest ambient temperature conditions that may be experienced at site. The heater element must be suitable for use at mains voltage and must be protected with a circuit breaker in the control panel labelled as follows:

Circuit Breaker Label: ENGINE HEAT

C3.2.18 FUEL SYSTEM

C3.2.18.1 GENERAL

The engine and entire fuel system must be suitable for use with all grades of diesel fuel commercially available in South Africa.

CCC No galvanized materials or materials containing zinc may form part of the fuel system. Unless specified otherwise the supply and installation of the entire fuel system inclusive of day tank, bulk tank, manholes and service connections form part of this contract. Should a bulk fuel tank be available at little or no charge from an oil company, the co-ordination of services with this oil company as well as negotiations regarding the installation of the tank forms part of this contract and tenderers must allow for this in their tender price.

C3.2.18.2 CONNECTION

CCC All electrical and fuel connections must be free of leaks and installed neatly as specified. All piping must be neatly secured by clamps or bolts. All fuel pipes or bolts except the flexible connections specified must be of copper. All connections between static and vibrating parts must be of reinforced flexible piping.

C3.2.18.3 FUEL FILTERS

C3.2.18.3.1 Two filters, a micro filter and heavy duty sludge filter must CCC be installed between the day tank and the engine. The filters must have replaceable elements suitable for the required fuel flow to the engine and for 200 hours continuous operation without maintenance. The housing of the sludge filter must be of a clear material to allow visual inspection and large enough to serve as a water trap.

C3.2.18.3.2 Should a bulk fuel tank be required, and additional heavy duty sludge filter similar to that described above must be installed next to the day tank in the fuel supply line from the bulk tank.

C3.2.18.3.3 All filters must be of high quality and easily maintainable. The filters must be mounted in easily accessible positions.

C3.2.18.3.4 Should no bulk tank be required, a suitable valve and sludge filter similar to that described above must be provided in the fuel supply pipe from the manually operated fuel pump. The filter must also have a see through housing so that the water content is visible.

C3.2.18.4 ENGINE FUEL SYSTEM

CCC Should the relative fuel levels in the specific installation make it necessary, an engine mounted fuel supply pump must be provided.

A manually operated fuel pump must be provided in the injector pump housing to facilitate bleeding of the fuel system.

A separate fuel solenoid valve must be provided in the fuel supply line to the engine. When the generator set is switched off, this valve must be closed. The solenoid must be designed for continuous service and must remain energized when the engine is in operation. The engine must be stopped, in normal operation or upon occurrence of an alarm condition, by de-energizing this solenoid.

C3.2.18.5 DAY TANK

CCC (1) The capacity of the fuel tank must comply with the lesser of the following requirements:

Sufficient fuel to provide the generator set at full load for eight hours in cases where a bulk tank is installed and 24 hours in cases where no bulk tank is installed.

The maximum amount of fuel that may be stored above ground in terms of the Authorities' regulations.

(c) Never more than 1 000 litres.

(2) The contractor must fill the day tank after completion of all acceptance tests.

The tank must be designed so that water and sludge will accumulate at the lowest point thereof where it can be drained of.

The tank must be manufactured of welded sheet steel to sufficient size to contain the specified amount of fuel.

The tank must be provided with an inspection opening, with a lid to facilitate cleaning and inspection.

The lid must be bolted to the tank with at least 4 bolts and a suitable gasket must be provided. A smaller screw-on lid for manual filling of the tank must be provided.

The tank must be supplied complete with a welded angle iron stand suitably designed for bolting to the floor. The day tank must be equipped with a level indicator, suitably protected against damage.

The fuel line to the engine must be connected to the tank, clear of the bottom, to ensure that sludge and sediment will not enter the fuel pipe.

The fuel return pipe from the engine must be directly connected to the tank.

A shut-off valve must be installed adjacent to the tank in the fuel line to the engine.

(10) If a bulk fuel tank is required, an electrically driven fuel pump for automatic filling of the day tank from the bulk fuel tank, must be supplied and installed.
The pump must be mounted on a shelf under the day tank forming part of the tank stand.

The pump must have sufficient capacity to overcome the level difference between the supply and delivery points, regardless of the respective fuel levels in the two tanks, as well as providing a fuel flow considerably in excess of the engine consumption. The fuel pump must run continuously while the engine runs, the excess fuel gravitating back to the bulk tank via an overflow return pipe. An alarm sensor, installed in the wall of the tank, must activate a fail-safe alarm circuit as soon as the fuel level falls below 80%.

(11) Should no bulk tank be required in the contract, a heavy duty, manually operated, electrically driven fuel pump with pumping capacity sufficient to fill the empty day tank completely in 30 minutes, must be supplied and installed. Should the day tank be smaller than 200 litres, this electrical fuel pump may be replaced with a 32mm hand-operated wing pump. In both cases the pump must be mounted on the day tank stand. A suction hose of sufficient diameter and length to facilitate filling the day tank from fuel containers on a vehicle outside the machine room, must be provided. To facilitate storage of the suction hose, a suitably steel frame or hose reel must be provided adjacent to the day tank.

C3.2.18.6 BULK FUEL TANK

CCC (1) Supply and install a bulk fuel tank with the specified capacity as indicated. The tender price tender price must include the cost of the excavation, the supply and installation of a concrete base and anchors in the excavated hole, the installing and anchoring of the tank, the backfilling of the

excavation, the building of an inspection manhole with lid, all fuel and electrical connections, content meter if required, and low alarm connection.

(2) The tank must be manufactured of welded sheet steel of sufficient thickness.

(3) The manhole must be brick-built at a height of at least 400mm above ground level and must be fitted with a standard cast iron lid and frame. The manhole must provide access to the electrical and fuel connections to the tank as well as the inspection manhole.

(4) The outside surface of the tank must be treated with cognizance of local ground conditions with cold bitumen or other similar protection against corrosion and water as recommended by the tank manufacturer.

(5) The tank must be provided with a standard tanker connection situated in the manhole. The tank must also have a breather pipe installed underground from the manhole to the machine room wall, vertically up the wall to terminate under the roof eve.

(6) The tank must be installed on, and anchored to, a suitably designed concrete base to prevent underground water pressure raising the tank when empty. The contractor must submit his design drawing of the base to the engineer for approval before installation of the tank.

(7) If specifically specified in the detailed specification, a fuel content meter indicating the fuel content of the tank on the generator control panel, must be supplied and installed. A submerged pressure transducer, resistance wire or any other proven method complying with the relevant SANS requirements for such equipment, may be used.

The indication on the control panel must be calibrated in litre and must also be equipped with a N/O alarm contact to activate a remote alarm should the fuel content in the tank fall below 20% of the capacity. The metering equipment is fully described in the paragraph regarding control board instruments.

(8) The fuel pipe to the generator must withdraw fuel clear of the bottom of the tank so that sufficient space is left for sediment and water.

(9) A wooden dipstick calibrated in litres for the direct measurement of the calibration content of the bulk tank, must be provided. The accuracy of calibration must not excee ± 5%.

C3.2.19 LUBRICATION

(1) Lubrication System

The engine must be provided with a high pressure lubrication system with sufficient capacity to ensure that all main bearings, gears and related moving parts subjected too high wear, are sufficiently lubricated.

BBB (2) Oil Filters

Coarse and fine oil filters with replaceable elements suitable for 200 hours service without maintenance, must be provided in an easily accessible position.

(3) Filter elements and oil

The contractor must supply the generator set complete with filter elements as well as the first filling of lubricants. The cost of these items must be included in the tender price.

BBB (4) Pre-lubricating pump

All engines rated 500 kW and larger must be provided with an electrically driven pre-lubricating pump to raise the oil pressure in the engine to the minimum working level immediately before the engine starts, if recommended by the engine supplier.

CCC (5) Drain pump

A hand-operated oil sump drain pump must be provided for all sets rated 230 kW or larger, in cases where draining the engine oil is difficult. The drain pipe and hand valve must be mounted in an accessible position on the outside of the engine base to facilitate easy draining of the engine oil.

C3.2.20 BATTERY

CCC (1) The set must be equipped with a fully charged lead acid battery of sufficient capacity and voltage to suit the electrical system and requirements of the generator set.

(2) The battery capacity must be sufficient to ensure that it can, at minimum ambient temperature, maintain the full starting current of the generator set continuously for 90 seconds without the cell voltage dropping to below 1,5 volts pr cell while the starter is running. Should the control and protection circuits also be powered by the starter battery, the battery capacity must be sufficient to maintain the control and protection circuits after operation of three starting cycles of three attempts each.

The battery must be mounted on a frame of wood or PVC covered angle iron near the starter motor. The frame must be mounted independently of the vibrating parts of the set.

Battery cables installed from the battery across the floor to the set, must be protected with a sheet metal housing.

When the engine is in operation, the battery must be recharged by an engine mounted alternator/rectifier with automatic current control. When the engine is not in operation, the battery must be recharged by a constant voltage battery charger mounted in the control panel in accordance with the battery manufacturer's specification.

All connections to the battery must be sealed airtight with a non-grease type sealant which does not dry out, such as TECTYL or similar, to prevent corrosion of the connection.

C3.2.21 BATTERY CHARGER

CCC (1) When the set is not in operation, the batteries must be kept charged by means of a battery charger mounted in the control panel. The supply to the charger must be directly connected so that the charger supply is maintained regardless of the positions of the selector or bypass switches. The 230 Volt terminals and components must therefore be covered to prevent touching.

(2) The battery charger must be suitable for use at the normal mains supply voltage with a maximum voltage variation of ± 10% and a maximum frequency variation of ± 3 Hz.

(3) The battery charger output must be automatically short circuit protected.

(4) The battery charger output voltage must be controlled, so that the charge current is maintained within the limits set by the battery manufacturer for all charge conditions.

(5) The maximum possible charge current must not exceed the limit set by the battery manufacturer.

(6) No manually operated boost charge facility must be provided.

(7) The battery charger must consist of a single phase, double winding, vacuum impregnated dry type transformer and full wave silicon diode rectifier. The battery charger must also be equipped with the following :

a main switch switching both the AC input and DC output;

HRC fuses to protect the input and output circuits;

internally mounted potentiometers for the adjustment of the maximum charge current and charge voltage ;

a flush mounted voltmeter to indicate the DC voltage; and

a flush mounted ammeter to indicate the DC charge current.

The protection fuses must be of the high rupturing capacity cartridge types, mounted in moulded case fuse holders. All incoming and outgoing circuits must terminate on numbered terminals.

Radio interferences must be suppressed in terms of BS800.

C3.2.22 LABELING OF EQUIPMENT

CCC (1) Diligent attention must be paid to the complete and clear labelling of all equipment.

Labels must consist of neatly engraved multi-layer hard plastic sheeting, so that the labels have white letters on a black background. Labels must be fixed with brass bolts and nuts of rivets. Self-tapping screws, glue, etc, shall not be acceptable.

(3) Each item of equipment, whether externally or internally mounted, must be labelled. This includes circuit breakers, isolators, contactors, meters and instruments, panel lights, switches and terminals.

(4) Labels for flush mounted equipment must be situated on the faceplates of the control panel directly below the indicated equipment. Where certain items of equipment are mounted closely adjacent to each other with insufficient space below for labelling, such as single pole circuit breakers, such equipment must be numbered with engraved labels. An engraved legend cared must be provided elsewhere on the front panel of the control board, denoting the function opposite each relevant item number.

(5) The conductors must be numbered at each end in accordance with the conductor number on the drawings. The terminals, to which such conductors are connected, must be independently and similarly numbered.

C3.2.23 LOOSE EQUIPMENT

C3.2.23.1 DRIP PANS

CCC A sturdy, removable drip pan must be provided under the generator set. The pan must be manufactured of galvanized sheeting with the edges at least 30mm high. The edges of the steel must be bent over to stiffen same. The pan must cover the entire inner area of the base frame so that any water, oil or fuel leakages will be contained.

Provide a similar drip pan for the day tank. The pan need not be removable, but must be larger than the horizontal area of the day tank.

C3.2.23.2 BATTERY EQUIPMENT

CCC Supply in each machine room a five litre plastic electrolyte can filled with distilled water, a suitable funnel and hydrometer.

C3.2.23.3 FIRE EXTINGUISHERS

CCC Two 4,5 kg CO2 fire extinguishers, suitable for use on electric fires, must be supplied and installed against the inner walls of the machine room in the indicated positions.

C3.2.23.4 GLOVES

CCC Supply one pair of electrical insulating gloves. The gloves must be of the large size and suitable for use at 1000 Volt.

C3.2.23.5 EMERGENCY LIGHTS

CCC Supply, install and connect 40 Watt fluorescent tube emergency lights, one above each generator set and one above each control board. The light fittings must be switched on and off by a suitable light switch situated at the generator room door and must be powered by the starting battery of the set. The circuit must be protected by a suitably sized fuse mounted in the control board.

The emergency lights must be supplied from one central or individual inverter units powered by the set starter battery only when the DC light switch is on. No additional batteries or chargers must be provided. The light output of the fittings must be 100% of the normal light output of a 40 Watt fluorescent tube lamp.

The supply and installation of all conduit, wiring and associated accessories forms part of this contract. Surface-mounted conduit must be painted in accordance with the colour of the surface upon which it is mounted.

C3.2.23.6 CABINET

CCC Supply and install a floor standing steel cabinet with shelves, lockable doors and two keys to house the specified loose equipment, spares, manuals and tools in the indicated position in the machine room. Only one cabinet per machine room is required, regardless of the number of sets.

C3.2.23.7 MANUALS

CCC Two complete sets of manuals must be provided and placed in the steel cabinet in the machine room. Each set must contain at least the following:

All manufacturers' requirements.

(2) Complete operational instructions.

(3) A fully illustrated technical description containing full instructions for maintenance and repair work to the engine, alternator and control board.

Each copy must be in the form of a full workshop manual compiled by the equipment manufacturer.

(4) A comprehensive spares list.

(5) A set of A3 size drawings showing the electrical installation and wiring, fully annotated. All conductor numbers and switchgear components must be shown.

Each manual must be prepared professionally and bound in book form. Drawings must be drawn professionally with stencilled annotations.

The contract shall not be regarded as being complete before the contractor has fully complied with these requirements.

C3.2.23.8 GENERAL

CCC The respective requirements regarding the provision of spares, tools drawings and notices are described in separate paragraphs under the relevant headings. Please refer thereto.

C3.2.24 SPARES AND TOOLS

CCC Tenderers must allow in their tender price for the supply and delivery at site of the following spares and equipment:

Tools (per installation, regardless of number of sets)

1 - set chrome vanadium spanners 6mm - 22mm, one end open and one end ring
1 - set Allen keys 2mm - 10mm
2 - screwdrivers, one larger and one small
1 - hydrometer
1 - 150mm pliers with insulated handles and wire cutting section

Engine spares (per each engine and additional to installed items)

2 - sets of all fuel filter elements
4 - sets of all lubricating oil filter elements
1 - set of air filter elements
1 - set V-belts

Control board spares

2 - lamps of each type used
2 - fuses of each type used

Alternator spares

1 - set diodes

C3.2.25 PAINT FINISH

C3.2.25.1 METAL PARTS

BBB All exposed metal parts forming part of the installation, must, wherever relevant, be prepared and painted in accordance with SANS 064/1988. After treatment of the
CCC surface, the total thickness of the covering layer applied must at least comply with the following :

Baked enamel	:	(SANS 783 type 1)	- 90 micron
Baked powder epoxy paint	:		- 60 micron

Epoxy type spray paint
Minimum cover thickness : - 100 micron

C3.2.25.2 MACHINE ROOM FLOOR

CCC The concrete machine room floor must be treated as follows:

(1) The moisture content of the concrete must be less than 17%.

(2) Removal all loose material.

(3) Apply epoxy paint in accordance with the specifications of a reputable paint manufacturer to give a final minimum cover thickness of 150 micron.

C3.2.26 NOTICES

CCC (1) Supply and install a clear and easily readable warning notice in a prominent position in the machine room. The notice must be made corrosion-resistant material, preferably plastic, with big and clearly engraved letters, reading as follows:

DANGER

This engine will start without notice. Turn selector switch on control board to "OFF" before working on the plant.

(2) Supply and install a pressed metal notice, 250 x 150mm in size, on the outside of each door to the machine room. A skull and crossbones with the words "GEVAAR/DANGER/INGOZI" must be engraved thereon.

(3) Supply and install all other notices required by the "Occupational Health and Safety Act", as amended.

C3.2.27 DRAWINGS

C3.2.27.1 PRIOR APPROVAL

BBB The successful tenderer must, immediately after being awarded the tender, submit two copies of each of the following drawings to the engineer for his approval:

(1) Complete general layout drawings.

(2) Working drawings detailing the fuelling and exhaust systems.

(3) Complete dimensioned drawings showing the generator set with accessories.

(4) Complete wiring diagrams including block diagrams of all control and other circuitry.

(5) A complete to scale drawing of the font elevation of the control board showing the position of all equipment.

C3.2.27.2 AS-INSTALLED DRAWINGS

DDD After completion of the installation a comprehensive drawing must be prepared, at least A1 in size, professionally drawn in black ink on polyester paper. A free-hand drawing and/or annotations shall not be acceptable. The drawing must mainly consist of three sections as follows:

A schematic layout of the heavy current switchgear, connections, busbars and instruments

(2) A complete wiring diagram of the light current control equipment and conductors with all components, conductors and conductor numbers clearly shown and described.

(3) A similar complete wiring diagram of the engine mounted control panel.

All conductors, conductor numbers, components and contacts must be clearly shown exactly as installed and connected. A legend defining all abbreviations and drawing symbols, the name of the installation, the name of the contractor, his project reference number and telephone number for maintenance calls, must clearly be shown on the drawing.

This drawing must be submitted to the engineer after preparation thereof for his written approval. One paper copy of the approved drawing must be mounted behind a Perspex cover at eye level against the machine room wall with four screws and rawl plugs.

C3.2.28 TESTING

C3.2.28.1 GENERAL

The complete testing of the set as well as the provision of the necessary test facilities, instruments, dummy load, switchgear, fuel and lubricating oil to conduct the tests, forms part of this contract.

BBB The generator set must be tested strictly in accordance
CCC with the specification at the supplier's premises and
DDD after installation thereof in the machine room at site. The supplier must advise the engineer at least 2 weeks in advance of each test date so that he or his representative can arrange to attend.

In all cases the instruments provided by the supplier for test purposes only, shall remain the property of the supplier. These instruments must be of high quality to ensure that the readings obtained are accurate enough to determine compliance of the set to the requirements.

C3.2.28.2 PREPARATION FOR FACTORY TEST

BBB The contractor must prepare the set as follows at least 8 hours before the initial test at the factory. After the set has been prepared it must not be run for a period of at least 8 hours preceding the test.

(1) All services must be connected.

An adjustable resistance dummy load of sufficient capacity for 110% of full load of the set must be connected. The dummy load must be initially set to the load specified to be accepted by the generator set in one step, e.g. 70% of full load or 100% of full load whichever the case may be.
The dummy load must be a balanced three phase load with the phase currents not more than 5% out of balance.

The engine exhaust pipe must be taken out of the test area so that no excessive gas build-up can occur in the test area.

The set must be positioned so that the hot air can ventilate out of the test area with minimum of recirculation.

The control board must be connected to the main supply and the selector switch set in the "off" position. To avoid connecting the dummy load to the main supply, the dummy load must be connected through an isolator to the control board emergency supply busbars. The isolator must initially be switched off.

The following instruments must be connected to the alternator supply terminals or other suitable position.

A digital frequency meter connected to any phase.

A digital voltmeter connected to any phase if the alternator voltage control monitors all phase voltages. If only one phase is monitored for control purposes, the voltmeter must be connected to that phase.

Three moving iron ammeters to read the phase current connected through current transformers if necessary.

(d) An electronic power factor meter connected as described in (b) above.

The fuel supply to the engine must be arranged in such a way that the supply to the engine can easily be changed from the main fuel tank to a calibrated 5 litre fuel measure and back.

Supply a stop watch for timing purposes.

NOTE :

Should the contractor request the engineer to test the set and the engineer, upon arrival at site, find that he cannot test the set according to the specification because the contractor has not prepared the set as specified, or has supplied insufficient or inferior instrumentation, the engineer will postpone the test and all fruitless travelling, accommodation, time and other costs incurred by him shall be to the account of the contractor.

C3.2.28.3 FACTORY TEST

BBB The following tests must be carried out at the premises of the manufacturer:

(1) Place a competent person at each of the frequency meter, voltmeter and ammeter to take down readings.

Switch the control mode selector switch to the "Auto" position. Switch off the mains supply to the control board to simulate a power failure and to initiate the start cycle. Immediately switch the dummy load isolator on to connect the dummy load to the emergency supply busbars.

As soon as the set starts and the change-over switch connects the dummy load to the alternator, immediately read and note the:

minimum frequency,
minimum voltage,
maximum current, and
minimum power factor.

If possible, also note how long after the connection to the load the voltage and frequency take to stabilize. Note the stabilized values.

(5) Check if the load and phase balance of the dummy load was adjusted correctly for the load the set was specified to accept in one step.

(6) Should the specification require the set to accept less than 100% load in one step, the dummy load must be adjusted to 100% load within 15 seconds after start-up of the set. Immediately after which the abovementioned voltage, frequency, and time readings must be repeated.

After the set has run at full load for several minutes to stabilize, increase the load to 110% of full load for 1 hour. After this the load can be reduced to 100% and the set run for another hour. During this two-hour period the following readings must be taken at least every 30 minutes:

Engine temperatures

Engine oil pressure
Supply voltage
Supply current (3 x)
Frequency

(8) After the above test has been completed, the voltage, power factory, frequency and phase currents must be noted before and immediately after a load change of 25% of full load.

Switch the dummy load isolator off and the supply voltage to the control boards on. Note the time taken for the:

(a) Change over switch to operate and,

(b) The engine to stop.

(10) Check the set thoroughly for any leakages.

(11) Check the construction, paint finish, mounting, labels, instrumentation and equipment for compliance with the specification. Check if all the items marked "B" in the specification has been complied with.

C3.2.28.4 TESTS AFTER INSTALLATION OF THE SET ON SITE

CCC After completion of the installation the following test and inspections must be conducted:

Test the control, alarm and protection functions of the set by simulating a fault condition in each circuit in turn.

(2) Check the entire installation regarding all items marked "B" and "C" in the specification.

(3) Check the quality of the installation regarding the ventilation louvres, exhaust system, fuel tanks and connections, electrical cable work, emergency lighting, paint finishes, connections to starting battery and mounting thereof, compliance to requirements regarding manuals and drawings and general making good of damage to the building wherever applicable.

NOTE:

The installation shall not be accepted should any of the above items be incomplete or requirements not complied with.

C3.2.29 TRAINING OF THE OPERATOR

DDD After the set has been completed and commissioned, the contractor must train a competent person appointed by the client to fully understand the operation of the installation.

C3.2.30 GUARANTEE AND MAINTENANCE

C3.2.30.1 GUARANTEE

The contractor must guarantee the installation for a period of twelve (12) months from the date of acceptance of the completed installation by the client.

After being notified of a fault, the contractor must immediately, at his cost, do the necessary maintenance work to ensure that the installation is in good working order.

C3.2.30.2 MAINTENANCE

DDD (1) The contractor must maintain the installation in accordance with the requirements of the equipment manufacturers and normal practice, for a period of twelve months after acceptance of the completed installation by the client. The requirements in par. 5(a) to (k) below must also be complied with.

(2) After expiry of the twelve months maintenance period, the client may require the contractor to enter into a service contract for a further period of one year. This service contract may, on mutual agreement, be renewed on a yearly basis.

CCC (3) All tenderers must submit with their tender, a complete provisional service and maintenance contract.

This contract must be a formal document signed by an authorized representative of the supplier and must detail the monthly service cost for the first year of maintenance after the expiry of the twelve month maintenance period. Tenderers must also specify the terms of escalation of the quoted service cost.

(4) The signing of the service contract shall in no way influence the validity of the abovementioned guarantee.

In terms of this service contract, the successful tenderer must undertake to have a suitably trained member of his staff visit the installation at least once per month to carry out the following activities:

He must report to the responsible person on site and document his respective service activities, the date of his visit, tests, adjustments done and all further relevant details in a logbook which much remain in the machine room.

(b) Clean the generator set and related equipment thoroughly.

(c) Lubricate all moving parts according to instructions.

(d) Check the air filter and clean or replace same according to instructions.

(e) Check the lubricating oil, add oil or replace according to instructions.

(f) Note the reading on the hour meter.

(g) Replace the lubricating oil filter according to instructions.

(h) Do all adjustments to the engine valves and fuel injection equipment according to instructions.

(i) Clean the starting battery and top up electrolyte if required.

(j) Run the set for 30 minutes on load and check for satisfactory operation.

(k) Report to the client in writing regarding all major service requirements, components that are worn or damaged or must be replaced according to manufacturer's instructions. The contractor must submit a detailed quotation for each of these items.

C3.2.31 QUALITY SPECIFICATION BBB CCC

C3.2.31.1 GENERAL

This quality specification determines the minimum requirements applicable to all equipment forming part of this installation.

Describing the quality requirements of any piece of equipment herein does not necessarily mean that such equipment is required in this installation and is only applicable as far as it is relevant.

Where equipment is specified by name in the specification, alternative makes may be offered subject to the engineer's prior approval and full compliance to the specified requirements, SANS and/or BS specifications applicable.

The onus for obtaining the engineer's prior approval for such alternator supply equipment deviating from the specified requirements without obtaining the engineer's prior approval, the engineer may instruct him to remove such equipment immediately and replace same with equipment complying with the specified requirements. The cost of such replacements shall be for the account of the contractor.

All equipment of the same type must be of the same manufacture.

C3.2.31.2 RUPTURING CAPACITY

The fault current rupturing capacity of all equipment guaranteed by the manufacturers thereof, must at least be greater than the unsymmetrical fault level of the system of which it forms a part. Should this not be the case, sufficient back-up protection must be provided by installing correctly sized HRC fuses.

C3.2.31.3 LOCALLY MANUFACTURED, SANS-MARK

Equipment manufactured in the RSA must preferably be used. Such equipment must preferably also bear the SANS mark. Should equipment with the SANS mark not be available, equipment bearing SANS approval must preferably be used. As a last alternative equipment bearing the relevant BS, VDE or NEMA-marks of approval may be used.

C3.2.31.4 FUSES AND HOLDERS

High rupturing capacity fuses must comply with the requirements of SANS 172 or BS 88 and have a rupturing capacity of at least 80kA. Fuses not mounted in fuse switches, must be mounted in retractable holders and suitable bases.

The fuse unit must be securely mounted on the holder and not on the base. Each fuse and holder must have an inspection hole or point to enable identification of a blown fuse. The live supply conductor must be connected to the upper terminal of the base.

C3.2.31.5 HIGH RUPTURING CAPACITY FUSE SWITCH COMPLETE WITH CARTRIDGE FUSES

The fuse switch must be of the 3-pole type with sufficient current rating for the service application and must comply with BS 2510 of 1954 or BS 3185 of 1959 whichever is applicable. The "ON" and "OFF" positions must be clearly indicated. With the switch in the "OFF" position the fuses must be fully isolated. The cover must be interlocked to prevent the switch from being opened while it is in the "ON" position and to prevent the switch being operated when the cover is opened.

C3.2.31.6 MOLDED CASE AIR CIRCUIT BREAKER: 1A - 800A

This circuit breakers must comply with the requirements of SANS 156 of 1977 as amended and must be suitable for use at mains voltages up to 440/250V, 50Hz, alternating current.

The fault current rupturing capacity of each unit must at least be greater than the fault level of the systems at the point of installation. Failing this, each unit must be back-up protected with suitably chosen HRC fuses.

C3.2.31.7 CONTACTORS

Contactors may be of the open or totally enclosed types. The contactors must be 3-pole, electro mechanically air break units, suitable for use in a 440/250V system and must comply with SANS 1092 of 1977, as amended.

The current rating of the contacts and the mechanical strength of the unit must be sufficient to ensure that the unit shall withstand the maximum unsymmetrical fault current of the system for the period required for the protective circuit breaker and/or fuse to interrupt the fault without the contactor being damaged in any way.

Non-current carrying metal parts must be interconnected and suitably earthed to the earth terminal of the distribution board.

The voltage rating of the control coils of the contactors must comply with the system voltage. Contactor parts used for mains transfer switches must be mechanically and electrically interlocked.

Should the auxiliary contacts form an integral part of the contactor, units with sufficient contacts to ensure that one N/O and one N/C contacts are left as available spares in addition to contacts used for interlocking purposes. All auxiliary contacts must have a current rating of at least 6 Amps up to 230 Volt AC and unity power factor.

C3.2.31.8 RELAYS

All relays must be of the "OAK", "TELEMECANIQUE" or "SIEMENS" or equal types. The voltage rating of the coils must be matched to the system voltage and the current rating of the contacts must be greater than required for the connected load.

Relays with a current rating of 6 Amp or lower must be of the plug-in type with a matching bakelite or similar type base plate. The base plate must be mounted in the board so that the relay can be viewed and/or removed easily. Connections to the base plate must be soldered or fixed with screw terminals. The relay must be housed in a dust proof clear plastic housing.

C3.2.31.9 VOLTMETER SELECTOR SWITCH

All voltmeter selector switches must be suitable for a 4 wire, 3 phase 50Hz system at the specified system voltage and must be of the double contact air break type with an "off" position and 6 switch positions so that the phase-to-phase and phase-to-neutral voltages can be read with one voltmeter. The contacts must be of the break before make type. The switch positions must be clearly labelled, and the unit must be suitable for flush mounting in the board so that only the control knob and indicator plate are mounted on the front of the faceplate of the distribution board.

The selector switch must be mounted directly below or next to the relevant voltmeter.

C3.2.31.10 SELECTOR SWITCHES

Selector switches for the control and switching of control circuits must in general be of the same type of construction and specified for voltmeter selector switches. The movement of the lever must be limited to only allow sufficient rotation to cover the number of switch functions required and no more. The number of poles required to obtain the specified switch functions must be mounted on a common shaft. The contacts must be of a silver alloy or equal quality.

The current rating and service duty of their contacts must be suitable for the specified application.

C3.2.31.11 PANEL LIGHTS

All panel lights must be of the TELEMECANIQUE or KLOCKNER MOELLER or equal type supplied with 22mm dia. chrome mounting ring. The lenses must be red, green or yellow, depending upon the phase colour, or indication required. All panel lights must be provided with LED's.

C3.2.31.12 PUSH BUTTONS

All push buttons used in the installation must be of the TELEMECANIQUE or KLOCKNER MOELLER type or units of similar quality unless specified otherwise.

The push buttons must be mounted flush in the board and fixed with chrome plated screw type mounting ring. In general a push button with a green knob must be used for a switch on function and a push button with a red knob for a switch off function.

C3.2.31.13 VOLTMETERS, AMMETERS, FREQUENCY METERS AND HOUR METERS

These types of meters must be of the "P.C.I." (Process Control Instruments) or really equal quality units of another manufacture. The dial plate of each meter must be 96 x 96mm square. All frequency meters, hour meters and voltmeters must be protected with HRC fuses installed on the supply side of each circuit. The fuses must be housed in the conventional, withdrawable holders. The fuse holders must be mounted near the relevant meter and must be clearly mounted.

C3.2.31.14 AMMETERS: INDICATION AND MAXIMUM DEMAND COMBINED

The instrument must be suitable for flush mounting with a 96 x 96mm square dial plate and must consist of a moving iron ammeter suitable for indication of the momentary current value, combined with maximum demand ammeter with a bimetal element indicating the average current value on a 15 minute basis. The maximum demand ammeter must be equipped with a resettable, residual indicator, indicating the highest current reading obtained. The bimetal system must be compensated for ambient temperature. All three indicators must be mounted on concentric scales.

The instrument must comply with BSS 89 as amended.

The ammeter must be equal to the PCI type FBia for use with a suitable metering type current transformer with a 5A secondary winding.

C3.2.31.15 TERMINALS

Terminals for control and interlock circuits must be of the "KLIPPON" type or other type of equal quality. The terminal units must mount on a common metal rail suitable for mounting in the distribution board. The current rating of the terminals must suit the application and in no instance be smaller than 5A.

C3.2.31.16 EARTH LEAKAGE RELAY (30mA) : SINGLE AND THREE-PHASE UNIT

(a) With circuit breaker

The unit must operate on the current balance principle. The sensitivity and reaction time of the relay must be sufficient to ensure immediate tripping should an earth leakage current of 30mA or more occur. The unit must be compensated for ambient temperature variations and the sensitivity must remain within limit for normal frequency variations.

The unit must be equipped with an integral test push button by means of which the operation of the unit can be tested. The unit must be able to withstand fault currents as defined in SANS 156 of 5kA between phase and earth, phase and phase and phase and neutral conductor without any damage.

The single phase unit must be complete with a single or double pole circuit breaker and the three phase unit complete with a three pole circuit breaker. The circuit breakers must be equipped with over current of at least 5kA when tested in accordance with SANS 156.

The three phase earth leakage units and relevant circuit breaker must be suitable for use in a 400/231V 50Hz system and the single phase unit and relevant circuit breaker must be suitable for use in a 230/220V 50Hz system. The earth leakage units must in all respects comply with SANS 767 of 1964 as amended and must bear the SANS mark.

(b) With isolator switch

The relay must comply with all the requirements detailed in (a) above except that the circuit breaker specified is replaced with on-load isolating switch with shunt trip coil and a fault current rating of 5kA.

C3.2.31.17 THREE POLE ON-LOAD ISOLATOR SWITCH WITHOUT SHUNT TRIP

The isolator switches must be of the manually operated, air break type, suitable for flush mounting in a panel. The contacts must be silver alloy and the switch mechanism must be of the snap action type. The switches must be able to make and break circuits under full rated load and must be equipped with arc chutes.
The switches must be able to withstand switching in a short circuit and shall be rated according to the fault current rating of the board at the position of installation.

To identify an isolator from a circuit breaker, the handle of the isolator unit must be in a different colour and the unit must be permanently marked "isolator".

C3.2.31.18 BUSBAR INSULATORS

All busbar insulators must be glass fibre or epoxy, suitable for use at voltages up to 600V. The insulators must be able to withstand the mechanical stresses resulting from system short circuits.

C3.2.31.19 ELECTRONIC COMPONENTS AND PRINTED CIRCUITS

(1) The general arrangements, composition and configuration of circuitry and components must be logical and designed for easy maintenance and inspection of components.

(2) Components must be of the best industrial quality available.

(3) If possible all electronic circuits must be grouped in logical units for modules on printed circuits mounted in suitable frames.

(4) Printed circuit cards must be mounted vertically to allow sufficient air movement for cooling. Care must be taken that the heat build-up in the panel does not exceed the ambient requirements of the components.

(5) Printed circuits must be designed and manufactured in compliance with the requirements of publication 321 of the International Electro technical Commissioning affiliated to ISO.

(6) All contacts and terminals on printed circuits must be gold plated.

(7) The completed printed circuit must have a neat appearance with edges neatly finished.

(8) Each printed circuit must be marked with a clear identification code number corresponding with the code number on the frame so that the position is clearly identified.

(9) The code number on the frame must be visible when the control panel board doors are opened for inspection of the printed circuits. The corresponding code numbers must also be shown on the schematic diagram.

C3.2.31.20 THRYSISTORS AND POWER DIODES

Thrysistors and power diodes forming part of the charging and power supply circuitry must be of the best commercial quality available. All components must be of the silicon type.

C3.2.31.21 TIME RELAYS

All switch contacts in time relays must have a current rating at least greater than the circuit being switched and be suitable for the type of load being switched and the duty cycle. The relay must be equipped with a clear plastic, dust proof housing enclosing the relay coil, contacts and mechanism. The delay time must be adjustable with an external screw or button. The adjustment must be clearly calibrated in seconds and/or minutes.

C3.2.31.22 CABLES

All heavy current cables must be PVC insulated steel wire armoured cables with copper conductors of sufficient cross-sectional areas for the application in terms of the most recent editions of SANS 1507 and SANS 0142.

C3.2.31.23 WATER PUMPS

Centrifugal Pumps

Pumps shall be of the centrifugal type.

Pumps shall operate at a speed of not more than 25Hz (1 500 r.p.m.).

Pumps shall have ball or roller bearings.

Pumps which are not short coupled shall be provided with flexible couplings of the FENNER FLEX type.

Couplings shall be such as not to impose any restriction on the normal expansion and tolerances.

Pump efficiencies shall not be less than 70 per cent and the delivered water quantities shall not deviate more than 5 per cent from the specified values.

Pump and motor shall be aligned at the normal working temperatures and shall be installed on vibration mountings.

Water pipes shall be connected to the pump connections by means of flexible connectors.

CHIEF DAWID STUURMAN
INTERNATIONAL AIRPORT
AIRPORTS COMPANY SOUTH AFRICA

C3.3 Project Specification

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C3.3.1 GENERAL

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This section of the Specification covers the detailed requirements of the supply, delivery, off-loading, installation and commissioning of two new 500kVA generators at Chief Dawid Stuurman Airport.

Where the requirements of the Project Specification are in conflict with the Standard Specification, the Project Specification shall take precedence.

C3.3.2 SCOPE OF THIS CONTRACT

The work to be carried out includes the following:

The supply, delivery, installation, testing and commissioning of the generator sets and related equipment according to specification, within the tendered contract time.

The supply, delivery, installation, connecting, testing and commissioning of the control board, fuel piping, cables, air louvres and/or ducting, as specified.

(3) The supply, connecting and use of all test equipment, switch gear and fuel necessary to carry out the tests procedures described herein, or as offered by the tenderer. All test equipment remains the property of the successful tenderer.

(4) Employ the services of a specialist sub-contractor to carry out the work as indicated below pertaining to the decommissioning of the existing underground fuel tank and the installation of a new above ground fuel tank.

Conduct necessary Risk Assessments according to ACSA Specifications.
Decommission existing 9m³ UST and fill with slurry.
Abandon all underground pipes coming from existing tank to feeder tanks.
Supply and install 1 x 9m³ AST.
Supply and install 2 x Feeder tanks.
Supply and install remote filler box for filling of new AST.
Supply and install all pipe work from new AST to day tanks.
Supply and install pipe work from remote filler point to new AST.
Remove existing pumps x 2.
Supply and install 2 x pumps for feeder tanks.
Disconnect electrics from pump and reconnect to new ones.
Supply customer with log off details.
Sign off job card next to dealer signature.

(5) The supply and delivery of all spare parts, tools and manuals specified.

(6) Comprehensive maintenance and guarantee of all equipment for a period of 12 months after the date of completion of the installation.

(7) The supply and use of all materials and equipment not specifically detailed in this document, but required to complete the contract in terms of this document and all other authority's requirements and codes of practice applicable to this installation.

(8) The design and construction of a new fuel tank room as indicated on the drawings.

(9) Interfacing of the generator system to the existing SCADA system.

(10) Interfacing of the generator system to the PV plant being constructed at the airport.

C3.3.3 GENERATOR OUTPUT AND VOLTAGE

Generator power shall be generated at 400/231 Volt, 50Hz, 4 wire supply with solidly earthed neutral.

After the derating factors for the engine and alternator due to site conditions have been taken into account, the sets must have a site output and voltage as follows :

No load voltage	:	400/230 Volt
Power Factor	:	0.8 lagging
Frequency	:	50 Hz
Continuous rating	:	500kVA at 0.8 power factor

The generator sets are required to supply power to the electrical installation of the whole airport. The electrical load comprises general electrical equipment such as :

Instrument landing systems
Lighting
Air conditioning
Lifts
General electrical office equipment

The generator sets shall be capable of accepting step loads in accordance with the Standard Technical Specification.

C3.3.4 CONTROL PANEL

A separate control panel is required as indicated on the layout drawings. The control panels shall be equipped with the following :

Electronic controllers with the functionality of synchronizing the respective sets with each other and with the mains supply. The controllers shall have ethernet ports for data communications.
Motorized Air Circuit Breakers (ACB'S) as indicated below.

C3.3.5 ELECTRONIC DIGITAL CONTROLLERS

The electronic digital controllers shall be of the Deep Sea make as per the existing controllers deployed throughout the Airport and have the following minimum functionality.

The controller shall be an easy-to-use single or multi-mains controller with automatic transfer switch capability. Designed to synchronise single or multiple controllers with single or multiple mains supplies, the controller shall automatically control the change over from mains to generator supply or run generators in synchronisation with the mains to provide no-break, peak lopping and peak shaving power solutions.

The module shall be able to indicate operational status and fault conditions on the LCD screen with multiple languages available, by illuminated LED, audible sounder and SMS messaging.

Comprehensive communications shall be available via RS232, RS485 & Ethernet for remote PC control and monitoring, and integration into building management systems.

The comprehensive event log shall be able to record up to 250 events to facilitate maintenance. An extensive number of fixed and flexible monitoring and protection features shall be included. Easy alteration of the sequences, timers and alarms shall be possible using the PC Configuration Software. Selected configuration shall also be available via the module's front panel.

Key Load Share Features

Peak lopping
Sequential set start
Manual voltage/frequency adjustment
Generator load demand
Automatic hours run balancing
Mains (Utility) de-coupling
Mains (Utility) de-coupling test mode
Bus failure detection
Volts and frequency matching.

Key Features

Colour LCD graphical display
Configurable digital inputs
Configurable outputs
Configurable flexible sender inputs
Comprehensive electrical protection
Comprehensive loadshare capabilities
Mains (utility) fail sensing
Multiple mains (utility) monitoring
Peak lopping
Peak shaving
RS232, RS485 & Ethernet remote communications
Modbus RTU/TCP support
Configurable display languages
Audible alarm

Reduced file transfer time
Fault condition notification to a designated PC
Front panel editing with PIN protection
Configurable timers and alarms
Multiple date and time scheduler
Configurable event log (250)
Easy access diagnostic page
kW overload protection
Reverse power protection
Power monitoring (kW h, kV Ar, kV A h, kV Ar h)
USB connectivity
Backed up real time clock
Fully configurable via PC software
Advanced SMS messaging (additional external modem required)
Start & stop capability via SMS messaging
Additional display screens to help with modem diagnostics
DSENet® expansion compatible
Integral PLC editor

Electro-Magnetic Compatibility

BS EN 61000-6-2
EMC Generic Immunity Standard for
the Industrial Environment
BS EN 61000-6-4
EMC Generic Emission Standard for the Industrial Environment

Electrical Safety

BS EN 60950
Safety of Information Technology Equipment, including Electrical Business Equipment

Temperature

BS EN 60068-2-1
Ab/Ae Cold Test -30 °C
BS EN 60068-2-2
Bb/Be Dry Heat +70 °C

Vibration
BS EN 60068-2-6
Ten sweeps in each of three major axes
5 Hz to 8 Hz @ +/-7.5 mm,
8 Hz to 500 Hz @ 2 gn

Humidity

BS EN 60068-2-30
Db Damp Heat Cyclic 20/55 °C
@ 95% RH 48 Hours
BS EN 60068-2-78
Cab Damp Heat Static 40 °C
@ 93% RH 48 Hours
BS EN 60068-2-7
Three shocks in each of three major axes
15 gn in 11 mS

Degrees of Protection Provided by Enclosures

BS EN 60529
IP65 - Front of module when installed into the control panel with the supplied sealing gasket.

C3.3.6 LV CABLE CONNECTIONS

All cables shall be copper, PVC/PVC/SWA/PVC cables with copper conductors. The cables will be terminated by the Contractor.

C3.3.7 EARTHING

The earth terminal on the alternator shall be connected to the earth bar in the generator control board. All metal fuel lines, including the day tank metal frame shall be bonded and solidly earthed to the earth bar in the generator control board.

C3.3.8 DIESEL TANK

The contractor is to employ the services of a specialist sub-contractor to carry out the work as indicated below pertaining to the decommissioning of the existing underground fuel tank and the installation of a new above ground fuel tank.

Conduct necessary Risk Assessments according to ACSA Specifications.
Decommission existing 9m³ UST and fill with slurry.
Abandon all underground pipes coming from existing tank to feeder tanks.
Supply and install 1 x 9m³ AST.
Supply and install 2 x Feeder tanks.

Supply and install remote filler box for filling of new AST.
Supply and install all pipe work from new AST to day tanks.
Supply and install pipe work from remote filler point to new AST.
Remove existing pumps x 2.
Supply and install 2 x pumps for feeder tanks.
Disconnect electrics from pump and reconnect to new ones.
Supply customer with log off details.
Sign off job card next to dealer signature

Tenderers shall allow for all diesel piping in accordance with the Standard Specification.

C3.3.9 FUEL MANAGEMENT SYSTEM

The Contractor shall supply and install a semi-bulk fuel Management System in the Generator Plant Room. Allowance must be made for all the required piping.

The system shall be capable of serving both fuel tanks up to 14000ℓ.

The semi-bulk fuel management system will operate independently of the fuel supply system to the genset, or fuel supply system to another fuel storage tank. On a continuous loop, it will filter the diesel in the tank and simultaneously automatically drain the water mechanically, so no water sensor is necessary, i.e. not manual water drain.

The semi-bulk fuel management system will be fabricated from stainless steel, with a capacity of 45 litres, and be a 2 stage filtration system. It will also be mounted on a galvanised mild steel stand.

It will consist of a diesel/water separator filter with mechanically operated automatic water drains, 2 x resin impregnated diesel/water separator cartridges with 5 micron rating and an electronic timer to operate for 10 min on/off, 24/7/365. There will also be a stainless steel drip tray to contain the drained water from the system. A self-priming 230vAC pump with appropriate piping must be supplied to pump the diesel to/from the fuel tank.

The filtration ability of the resin impregnated filter cartridges to "polish" the diesel must be 5 micron, and must also be able to remove all/any emulsified water present in the diesel.

C3.3.10 NEW DISTRIBUTION BOARD

The Contractor shall supply and install a new floor standing distribution board in the generator plant room. The distribution board shall comply with the requirements of the Standard Specification, and shall be equipped with the following switchgear:

Generator supply :2x 800A motorized withdrawable air circuit breakers complete with electronic display modules to indicate current and voltage.

Bus coupler : 1x 800A withdrawable air circuit breaker complete with electronic display module to indicate current and voltage.

Feeders : 2x 800A withdrawable switch disconnectors.

The schematic diagram for the distribution board is included in this document. The make of switchgear shall match the existing switchgear; i.e. ABB for standardization and interchangeability.

The cables from the generator set shall enter the distribution board from the top via heavy duty welded mesh cable baskets.

C3.3.11 REMOVAL OF EXISTING EQUIPMENT

Tenderers shall allow for the removal of the following equipment :

The existing generator sets must be removed from the generator plant room and stored in the yard of the technical services building. Care must be taken to avoid any damage to the sets. Tenderers must also allow for heavy duty water-proof covers for the sets.

The existing control panel must be removed from the site after the switchgear and cradles have been carefully removed and handed to the Employer.

The existing day tanks must be removed from site.

All redundant cables must be removed from site.

Clearance from the Airport Security must be obtained before any materials are removed from site.

C3.3.12 BUILDERS WORK

A provisional sum for builders work has been included in the schedules of quantities, The extent and type of building alterations will be determined once the exact details of the actual generator sets have been determined.

The builders work will include the design and construction of a new fuel tank room as indicated on the drawings

A subcontractor will be appointed to execute the work, and payment for the work will be affected through this Contract.

C3.3.13 INTERFACING WITH SCADA

A provisional sum for interfacing of the generator system to the existing SCADA system has been included in the schedule of quantities.

A subcontractor will be appointed to execute the work, and payment for the work will be affected through this Contract.

C3.3.14 INTERFACING WITH PV PLANT

A provisional sum for interfacing of the generator system to the PV system being constructed has been included in the schedule of quantities.

A subcontractor will be appointed to execute the work, and payment for the work will be affected through this Contract.

C3.3.15 PROCEDURE

All pricing must include the transportation and rigging costs to put the equipment in place. All work that will not interfere with any of the operation of the airport can be done during normal working hours. Any work interfering

with operations must be carried out after hours in accordance with the airports operational hours and must be priced accordingly.

The procedures indicated are guidelines only. The contractor must liaise with the client and the engineer to prepare a detailed program of the shut downs required after hours to ensure that the work is carried out without affecting the operation of the airport.

Sufficient labour must be allowed during the shutdown to limit the time required for the shutdowns.

All switching and earthing to be done in strict compliance with regulations. The required Health and Safety procedures are to be in place and the correct personal protection equipment is to be used. Switching schedules and safe working procedures is to be submitted for approval before any work can be carried out. Safe working permits will also be required.

When changing over between the old and the new generators, one generator must be replaced at a time. The first replacement set must first be operational before the second set can be replaced.

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Part C3.4 : MANAGEMENT OF THE WORKS

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1 PROGRAM AND KEY MILESTONES

1.1 It will be expected from the Contractor to work in close collaboration with ACSA personnel.

1.2 The Special Documentation Required, indicated in Part T2.2, Form C11, shall be submitted with the Tender.

1.3 The contract Starting Date is the date that the Form of Offer and Acceptance, Part C1.1 is signed. It is the intention of the Employer to make the appointment as soon as possible after the bid closing date.

1.4 The documentation required before Access of the Site:

- Detail priced bill of quantities reflecting the final Approved design;
- Health and Safety Plan within 14 days of the Starting Date and before site access;
- The Contractor shall submit a final program of works for approval by the Employer within 14 days of the Starting Date.
- The Contractor shall submit a Performance Guarantee within 14 days of the Starting Date.
- Proof of Insurance within 14 days of the Starting Date;
- The final Design Document and drawings shall be submitted within 28 days of the Starting Date for Approval by the Project Manager.

1.5 The Access Date shall follow 14 days after approval of the final Design Document and formal instruction by the Project Manager.

1.6 The required factory acceptance tests shall be clarified with the Project Manager before delivery.

1.7 The Completion Certificate shall only be issued following the successful completion of the Provisional Acceptance Tests in terms of the approved Project Inspection and Test Plan. The Project Inspection and Test Plan must be submitted with the tender in term of Form C11 included in Part T2: Returnable Schedules.

1.8 The Defects Liability Period is 12 months, starting on the date that the Works Completion Certificate is issued;

1.9 Functional, manufacturing and installation defects during Defects Liability Period shall be corrected by the Contractor free of cost for the Employer within 2 weeks.

1.10 The Final Completion Certificate, following the Defects 12 months Liability Period, shall be issued by the Project Manager starting on the date on which the Works are completed and all defects corrected in accordance with the Contract. The Works shall not be considered as complete in all respects until a Final Approval Certificate has been delivered by the Project Manager to the Employer and the Contractor

2 CONTRACT PRICE ADJUSTMENT

The tender calls for a fix price for the construction period offered in terms of the envisage program of the Employer. However, the Contractor shall submit the Tender Price Basis, the Contract Price Adjustment Schedule applicable as well as a list of Special Equipment influenced by the exchange rate (Refer to Form C9 in Part T2: Returnable Schedules).

3 KEY PERSONNEL

Tenderers must submit details and certification of the following key personnel required on this project:

Contract Manager

Site Agent

Electrical Foreman

ORHVS Certified Person

The required medium voltage switching shall be done by a person trained and certified by a duly accredited trainer registered with the SETA.

4 PROVISIONAL AND GENERAL ITEMS

Details of the allowance for provisional and general items shall be as per the Bill of Quantities. Items not allowed for but required by the Contractor shall be added by the Contractor in the space allowed for this purpose in the Bill of Quantities.

Additional provisional and general items/cost will not be entertained after the appointment of the Contractor.

4.1 Site security and storage

The Contractor shall guard and/or provide ACSA approved security for the project *inter alia*:

- Equipment, material, tools and other items used in connection with the construction of the Plants;
- The subcontract works;
- Its employees and subcontractors to the extent required.

The Contractor shall provide secure and appropriate storage on the Site (or at nearby locations at the Contractor's cost) and properly identify all materials, supplies and equipment required for permanent and temporary Construction of the Plant. The Contractor shall be liable for any losses.

4.2 Consumables and utilities – electricity, water, sewage and waste disposal services

Electricity and water shall not be provided by the Employer.

The Contractor is responsible to provide a site office, a change room, a storage container and the required toilets in respect with the local regulations.

If the Contractor needs any other facility, it is the Contractor's responsibility to bring its equipment on site at its own costs, and make sure it will be usable without interfering with the other activities on site.

The Contractor shall be responsible for removing of all waste materials and rubbish during construction and after completion of the project.

5 PC SUMS

PC Sums have been allowed for in the Bill of Quantities. The total of the amounts allowed for the various works have been transferred to the summary sheet and will form part of the total tender price. The Contractor shall indicate the mark-up on the PC Sums, if so required, in the space allowed for this in the BOQ.

The following items will be priced and done under the PC sums allowed for the purpose:

The design and construction of a new fuel tank room as indicated on the drawings.
Interfacing of the generator system to the existing SCADA system.
Interfacing of the generator system to the PV plant being constructed at the airport.
The supply, installation and commissioning of a fire suppression system.
Employ the services of a specialist sub-contractor to carry out the work pertaining to the decommissioning of the existing underground fuel tank and the installation of a new above ground fuel tank.

6 DRAWINGS AND TECHNICAL DOCUMENTATION

The following documentation is included Volume 4 of the Document:

6.1 Engineer's drawings;
6.2 Project board details;

7 PROJECT BOARD

A standard "CESA" project board is required for the project and shall be allowed for by the Contractor under the Provisional and General items in the Bill of Quantities. Refer to Part C3.6 for details of the required project board.

8 ENVIRONMENT

The Environmental requirements are specified in Part C3.5: Generic Specifications.

9 HEALTH AND SAFETY

Health and Safety requirements and procedures are specified in Part C3.5: Generic Specifications.

10 RECORDING OF WEATHER

The contractor shall provide a rain gauge and maximum/minimum thermometer. He shall erect them according to the requirements of the weather bureau. The contractor shall record and keep a record of the daily rainfall and maximum/minimum temperatures and supply the data to the Employer on a daily basis.

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

11 QUALITY MANAGEMENT

11.1 The Employer expects the Contractor to engage in safety culture initiatives.

11.2 The Employer places emphasis on the provision of a comprehensive Quality Management System (QMS) for all phases of the Project. The Contractor shall develop and submit a Quality Management Plan (QMP) with the Tender (Part T2: Returnable Documents: Form C9). The QMP shall describe the project quality requirements and shall also describe the requirement for continued compliance to the requirement of ISO 9001:2008, ISO 10005:2005 & ISO 10006:2003 as revised/updated to date. The Contractor itself shall provide evidence of a fully implemented Quality Management System within its own organization. The Employer may at his sole discretion carry out an audit/assessment on any supplier or sub-supplier's QMS for acceptance.

11.3 The Contractor must appoint a designated individual to function as Project Quality Specialist within the Contractors organization, who will be responsible for the quality management of the work package, carried out. The Contractor Project Quality Specialist will report directly to the Employers Project Quality Manager for all Quality related activities within the project.

11.4 The Contractor shall submit a Project Inspection and Test Plan (ITP) with the Tender (Part T2: Returnable Documents: Form C9), for all equipment/services included in the Scope of Work which is in line with the requirements stipulated. The project ITP shall detail all elements of the equipment/services and shall itemize the required quality intervention levels for each of these components alongside the criticality rating of each of these ITP's which shall be submitted to the Employer for review and inclusion of the Employers intervention points.

11.5 The Contractor shall indicate in the project ITP which items are of a proprietary nature where the level of certification is limited to standard documentation and certificates of conformity. The Contractor shall use only ISO 9001 accredited suppliers for these products. Evidence of ISO 9001 certification shall be supplied with the delivery documentation. Failure to include this certification at the time of delivery shall result in rejection of the equipment / material / components by the Employer and/or appointed representative.

11.6 All equipment / material not shown as proprietary equipment in the project ITP shall be designed / manufactured / constructed / tested / commissioned by an ISO 9001 compliant organization. The relevant portions of the project ITP shall be issued to the supplier to ensure that all of the quality requirements are complied with. The supplier shall develop and apply approved quality plans for the design / manufacture / construction / testing / commissioning of the equipment/material. Each of these ITP's shall be submitted to the Employer for review, inclusion of the Employers intervention points and approval.

11.7 All equipment / material / components in terms of product realization shall be listed in accordance with the planning and Bill of Quantities and is to be regularly updated and supplied to the Employer.

11.8 The Contractor shall be responsible for all first level quality inspection activities. In keeping with Quality Management best practices and Employer risk management, the Employer shall undertake and execute all 2nd level inspections and related quality activities. All Third Party Statutory quality activities shall be performed by an approved inspection authority recognized in terms of applicable South African legislation and appointed by the Employer.

11.9 The Contractor shall incorporate these fundamentals in their procedures so as to demonstrate to the Employer the incorporation of such principles in the procedures, systems and training to create awareness and compliant behavior / decisions to these fundamentals.

12 INSPECTION TESTING AND COMMISSIONING

The Project Inspection and Test Plan (ITP) to be submitted as part of the compulsory Returnable Schedules (Part T2.2: Returnable Documents: Form C9), shall comply with the minimum inspection, testing and commissioning requirement described in this Section.

This section describes the minimum requirements of inspections, tests and performance verification that the Contractor shall demonstrate during execution and operation of the project. These tests are defined under:

- Tests before Installation;

- Tests after Installation;
- Tests on Completion; and
- Tests after Completion;
- Final commissioning.

At least 2 weeks prior to start of any tests, the Contractor shall provide to Employer and Employer's Representative detailed information regarding test schedules, testing methodology and equipment to be used and the criteria of acceptance of each test types. Test methodologies and acceptance criteria shall be prepared according to general requirements defined in IEC 62446, IEC 60364-6 and according to the current best commissioning practice. The Employer and Employer's Representative along with the Contractor shall agree on test methodology and acceptance criteria, prior running the test. The following information shall be submitted:

- Test program and standards;
- Manpower and deployment schedule of the Contractor for performing the tests forms of test records and report;
- Description of instrumentation to be used, including accuracy, and calibration test results;
- Method of data recording and evaluation method and acceptance/rejection criteria.

12.1 General Requirements

The Contractor shall adhere to the following requirements:

12.1.1 Factory Acceptance Tests

The Contractor shall allow FAT for the following items:

12.1.2 Standards Applicable

As indicated under C3.2.1 Standard Technical Specification for Emergency Generators.

12.1.3 Personnel and Facilities

Inspect, test, commission and perform all relevant tests of the Generator Plant on site to demonstrate compliance with the Contract, as built (design) documents and standards.

Provide facilities necessary to enable the inspection, testing, commissioning and performance testing of the Generator Plant to be satisfactorily completed including labour, equipment, materials, instruments, consumable materials, electrical power, fuel, lubricants, water, and such like.

Provide staff with the relevant skills and competence for the inspection, testing, commissioning, performance testing and witnessing required.

Provide the opportunity to the Employer and Employer's representatives to witness all commissioning tests. The Employer shall provide reasonable and adequate notice to the Contractor that other parties have been invited to witness the tests and the Contractor shall provide all facilities and support that are reasonably required by The Employer for such parties to witness the tests.

12.1.4 Instruments

Provide any instruments or other equipment for the Employer to review the accuracy, quality and performance of the Generator Plant. Provide any assistance required by Employer in the use of instruments and measuring equipment.

Ensure that instruments used for checking, inspection, testing, commissioning and performance monitoring are correctly calibrated according to their relevant standards. The contractor shall submit the valid calibration certificates with method statements and test record.

PART C3.5: APPLICABLE STANDARDS

All equipment and services supplied shall comply with the standards as indicated in Part C3.3 & Part C3.4

PART C3.6: LIST OF TENDER DRAWINGS

Drawings and documentation issued by the Employer

P7794E08-001-00 – Site Layout
P7794E08-002-00 – Generator Room Layout
P7794E08-003-00 – MV Reticulation Layout
P7794E08-004-00 – Generator Panel
P7794E08-005-00 – Diesel Storage

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PART C34: SITE INFORMATION

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PART C4: SITE INFORMATION

Document reference	Title	Pages
C4	1: Site Location	184
	2: Site Data	185
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1 Site location

Note that access to the site is through the Main Gate and that the site is on the airside of the airport.



2 Site Data

Note that the following site data is for tender purposes only. It is the responsibility of the Contractor to verify the data for design purposes.

It is the Contractor's responsibility to acquaint himself with the site conditions as well as the nature and strata of material on site. No additional claims will be entertained over and above the tender rates as submitted by the Contractor due to the lack of knowledge by the Contractor about the site conditions.

All the material and equipment being supplied in terms of this Contract shall be suitable for continuous operation at the total specified output or capacity under the following conditions:

Applicable site conditions	**Unit**	**Value**
Record high (January)	°C	40.7
Record low (August)	°C	-0.5
Average high	°C	22.3
Daily mean	°C	22
Average low	°C	13.5
Corrosion conditions	-	Severe
Pollution conditions	-	Moderate
Average relative humidity	%	74

Electrical network status	**Value**
Maximum design short circuit current at 400V point of supply	50 kA
System nominal voltage	11 / 0.400 / 0.230 kV
System highest voltage	12 / 0.45 / 0.26 kV
Contractual voltage	11 / 0.42 / 0.242 kV
Frequency + possible variation	50 Hz ± 1%
Neutral grounding system	Solid
Settings of upstream protection relays	Shall be provided on site

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PART C5: GENERIC SPECIFICATIONS

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PART C5.1: OCCUPATIONAL HEALTH AND SAFETY SPECIFICATIONS

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1. SCOPE

This Specification is intended for all ACSA Service Providers and Contractors to ACSA at the Port Elizabeth Airport.

2. OBJECTIVE

- To ensure that ACSA Service Providers and Contractors comply with the requirements of the Occupational Health and Safety Act No. 85 of 1993 and the Regulations thereto including any relevant standards and SANS codes of practice that may apply.
- To minimise and eliminate contractor's health and safety risks.
- To ensure that contractors submitting tenders make provision for the cost of health and safety measures to be implemented during the duration of the contract /during the construction process.

3. DEFINITIONS

Client means any person for whom construction work is performed.

Contractor (also referred as Mandatory), including a labour-only contractor, who carries out a trade, business or other undertaking (whether for profit or not) in connection with which he or she:

(a) carries out or undertakes to carry out or manages construction work; or
(b) arranges for any person at work under his control (including an employee of his, where he is the employer) to carry out or manage construction work; or
(c) provides a person or persons to perform work for a client.

Construction work means any work in connection with

(a) the erection, maintenance, alteration, renovation, repair, demolition or dismantling of or addition to a building or any similar structure;
(b) the installation, erection, dismantling or maintenance of a fixed plant where such work includes the risk of a person falling;
(c) the construction, maintenance, demolition or dismantling of any bridge, dam, canal, road, railway, runway, sewer or water reticulation system or any similar civil engineering structure; or
(d) the moving of earth, clearing of land, the making of an excavation, piling, or similar type of work.
(e) Any work in addition to the above which by agreement between the principal and the contractor may be agreed to be construction work, or any work which may be described as construction work in terms of the Construction Regulations to the OHS Act GN 1010 of the 18th July 2003

Competent person means any person having the knowledge, training, experience and qualifications specific to the work or task being performed. Qualifications and training must be in line with the South African Qualification Authority Act No. 58 of 1995.

Designer means a person who prepares a design; arranges for any person at work under his control(including an employee of his, where he is the employer) to prepare a design; an architect or engineer contributing to, or having overall responsibility for the design; building services engineer designing details for fixed plant; surveyor specifying articles or drawing up specifications; contractor carrying out design work as part of a design and build project; temporary works engineer designing formwork and false work; and interior designer, shop-fitter and landscape architect.

Fall Prevention Equipment means equipment used to arrest the person in a fall from an elevated position, including personal equipment, body harness, lanyards, lifelines or physical equipment, guardrails, toe-boards, screens, barricades, anchorages or similar equipment.

Fall Arrest Equipment means equipment used to arrest the person in a fall from an elevated position, including personal equipment, body harness, lanyards, deceleration devices, lifelines or similar equipment, but excluding body belts.

Hazard means a source of or exposure to danger

Hazard identification means the identification and documenting of existing or expected hazards to the health and safety of persons, which are normally associated with the type of construction work being executed or to be executed

Risk assessment is an activity conducted by competent person which includes
(a) the identification of the risks and hazards to which persons may be exposed to;
(b) the analysis and evaluation of risks and hazards identified;
(c) a documented plan of safe work procedure to mitigate, reduce or control the risks and hazards that have been identified;
(d) monitoring plan; and
(e) a review plan

Excavation work means making of any man-made cavity, trench, pit or depression formed by cutting, digging or scooping

Ergonomics means application of scientific information concerning humans to the design of objects, systems and the environment for human use in order to optimise human well-being and the overall system performance

4. NOTIFICATION OF CONSTRUCTION

Any contractor who intends to carry out construction which includes the construction work listed below must notify the Provincial Director by completing (Annexure A) prior commencement of any work at least 3 days after being officially notified by ACSA that s/he has been awarded the tender to carry out such work. Proof of such notification must be submitted to ACSA for reference purposes.

(a) the demolition of a structure exceeding a height of 3 meters; or
(b) the use of explosives to perform construction work; or
(c) the dismantling of fixed plant at a height greater than 3 meters;
(d) when the construction work exceeds 30 days or will involve more than 300 person days of construction work;
(e) excavation work deeper than 1 meter; or
(f) working at a height greater than 3 meters above ground or a landing.

5. REGISTRATION WITH THE WORKMENS COMPENSATION OR LICENSED INSURER (WCA/ FEM etc.)

Contractors shall ensure that ACSA is provided with a letter of good standing including a registration number with the Compensation for Occupational Injury and Diseases Fund or an alternative scheme approved in writing by the Commissioner to the COID Fund at least 10 days' prior commencement of construction work. It shall remain the Principal contractor's responsibility to furnish ACSA with a valid letter of good standing or keep a copy available for perusal by a Client, client representatives or any other person authorised thereto.

6. MANDATARY AGREEMENT FORM

A duly signed mandatory form also referred to as 37.2 shall be obtained from ACSA Safety Department. It must then be signed & submitted back to ACSA by the Principal Contractor at least 10 days prior to commencement of construction work. A Principal Contractor shall ensure that all its sub-contractors have completed a similar document and a proof of such signed documents is submitted to ACSA for reference purposes. No Principal Contractor shall appoint a contractor to conduct construction work unless she/he is reasonably satisfied that the contractor s/he intends to appoint has the necessary competencies and resources to perform the construction work safely.

7. ASSIGNED PERSON IN TERMS OF OCCUPATIONAL HEALTH & SAFETY ACT OF 1993 & ITS REGULATIONS

A written letter of appointment shall be forwarded to ACSA duly signed by responsible persons at least 3 days prior commencement of construction work for the following duties: **(Further appointments could become necessary as the project progresses and as per the requirements of OHS Act 85/1993)**

(a) Person assigned duties in terms of the 16.2 appointees of the Act
(b) Construction Work Supervisor
(c) Assistant Construction Work Supervisor
(d) Full-time or part-time Construction Safety Officer
(e) Scaffolding Erector
(f) Scaffolding Inspector
(g) Excavation Supervisor

(h) Explosive Powered Tool Supervisor
(i) Fire Equipment Supervisor
(j) Portable Electrical Equipment Supervisor
(k) Ladder Supervisor
(l) Personal Protective Equipment Supervisor
(m) Electrical Supervisor
(n) Lifting Machine Supervisor
(o) Lifting Tackle Supervisor
(p) Stacking and Housekeeping Supervisor
(q) Workshop and Plant Supervisor
(r) Oxy-acetylene Gas Cutting/Welding Supervisor
(s) Safety Representatives
(t) Competent Person in Risk Assessment
(u) Hazardous chemical substances Controller/Co-ordinator
(v) First Aider
(w) Incident Investigator
(x) Formwork and Support Work Supervisor
(y) Batch Plant Operator
(z) Demolition work supervisor
(aa) Fall protection developer/planner
(bb) Blasting supervisor (supervision of explosives workplace (ER 12)
(cc) Competent person in Confined Space entry

8. HEALTH AND SAFETY PLAN

A contractor shall provide ACSA with a Health and Safety Plan document that shall include but not limited to the following during tendering process, before commencement of construction work and during construction:

8.1 Contractor's Health & Safety Policy

A Contractor shall provide a health & safety policy signed by the Chief Executive Officer (CEO). which outlines contractor's commitment towards health and safety

8.2 Health and Safety Organogram

A Contractor shall provide a health & safety organogram which outlines the team leaders, 16.2 appointees, construction work supervisor, assistant construction work supervisor, safety representatives, safety committee members and other related appointments in terms of the OHSAct. The contact numbers should also be provided for easy reference.

8.3 Risk assessment

A risk assessment shall be conducted by a competent person, this includes:

1. identification of risks and hazards to which persons may be exposed; this is also to include ergonomic related
2. hazard analysis and evaluation of the identified risks and hazards;
3. a documented plan of safe work procedure to mitigate, reduce or control the risks and hazards that have been identified;
4. a monitoring and review plan of risks and hazards
5. relevant personal protective equipment or clothing to be provided which is SABS approved
6. fall protection plan for work carried in elevated position(s)

The contractor shall ensure that all employees are informed, instructed and trained by a competent person regarding any hazard and the related procedure before any work commences and records thereof to be kept in the contractor's health and safety file.

8.4 Fall Protection Plan

A contractor shall submit a risk assessment conducted by a competent person outlining the procedure and methods used to address all risks identified per location. A contractor shall

ensure that employees working in such elevated positions undergo a medical examination conducted by a registered occupational health practitioner. A certificate of fitness (i.e. employee's physical and psychological fitness) valid for a year shall be submitted prior commencement of construction. A contractor shall ensure that employees working from elevated positions receive proper training and such records are kept on file for reference purposes.

A contractor shall ensure that no person works in an elevated position, unless such work is performed safely as if working from a scaffold or ladder.

A contractor shall ensure that fall prevention and fall arrest equipment is inspected for its suitability and strength before use to ensure that it is safe for use and such inspections shall be recorded and kept on file for reference.

A contractor shall ensure that fall arrest equipment is used only if not reasonably practicable to use fall prevention equipment. Precautionary measures shall be taken by the contractor to ensure that in the event of fall by any person, the fall arrest equipment or the surrounding environment does not cause injury to the person.

8.5 Health and Safety Representatives

A contractor shall ensure that Health and Safety Representative(s) is/are elected and delegated in writing and necessary training has been provided by a competent person. A proof of training certificate shall be provided to ACSA prior commencement of construction work.

Health and Safety Representatives shall conduct regular inspections by completing a mutually acceptable form of checklist developed by the contractor. Safety defects noted shall be recorded and reported to the supervisor for remedial action. Health and Safety Representative Inspection findings shall be made available to ACSA for reference and audits purposes.

Health and Safety Representatives and their reports shall form part of the safety committee which shall meet on a regular basis as stated by the contractor.

8.6 Health and Safety Committee

A contractor shall hold health and safety meetings on site. Minutes of such meetings and action taken by management shall be kept on file and made available to ACSA for reference purposes. Members of the committee shall receive proper training and a proof of such training shall be made available.

The contractor shall ensure that ACSA Safety Department is invited to such meetings. These meetings do not substitute for Contractor's Site meetings.

8.7 HEALTH & SAFETY TRAINING

ENVIRONMENTAL HEALTH & SAFETY INDUCTION

The contractor shall conduct an induction training session prior commencement of construction work. An attendance register shall be kept in the contractor's health and safety file.

For any construction work to be conducted on the Airside Safety Induction training shall be attended by all persons entering who are to enter Airside and a course fee determined by ACSA shall be paid by the Contractor. A security permit to access airside shall be issued on production of proof of attendance.

INDUCTION CONDUCTED BY CONTRACTOR & COMPETENT PERSON

A contractor must make sure that their personnel and persons visiting the site undergo an induction conducted by a competent person prior commencement of construction work. Every employee on site shall be in a possession of proof of the health and safety induction training.

A contractor shall ensure that all visitors to a construction site undergo health and safety induction pertaining to the hazards prevalent on the site.

A manual /copy of such training shall be provided to ACSA for reference purposes.

As determined by the risk assessment, a contractor shall ensure that all employees under his/her control are trained by a competent person and a proof of such training is kept on file for reference.

Toolbox Talks

A Contractor shall ensure that employees attend a formal Toolbox conducted at least on a weekly basis. Toolbox Talks shall cover a wide variety of topics related to health and safety. An attendance register shall be completed by employees who attended such Talks. The register shall indicate the topic covered presenter, date and signatures of employees attended. Records for Toolbox Talks shall be kept in a health and safety file and be made available to ACSA for perusal.

First Aid Training

A contractor shall appoint competent First Aider(s) in writing where more than 10 employers are employed. A letter of appointment shall be kept on file for reference made available to ACSA Safety. Duly designated First Aider(s) shall undergo for training conducted by an accredited institution prior commencement of construction work and a proof of certificate be submitted to ACSA for reference.

The Contractor shall ensure that the first aid box (es) is/are controlled by qualified First Aider(s) and kept fully stocked with necessary first aid contents related to the hazards and risks identified. A first aid box must be accessible and location of such boxes) is clearly displayed on site.

8.8 Fire prevention and Protection

A contractor shall ensure that adequate fire equipment is provided in strategic places (that is, where there is a mobile distribution board, flammable liquids, vessels under pressure, confined spaces, hot work etc.). A contractor shall ensure that such equipment is inspected by a competent person on a regular basis and such inspections are recorded on a register. A contractor shall ensure that all fire equipment is serviceable and person(s) have been properly trained on how to use the equipment. A proof of such training shall be provided prior commencement of construction work.

8.9 EMERGENCY PREPAREDNESS

A contractor shall provide ACSA with an emergency plan and procedure which will include, but not limited to emergencies such as fire, bomb threat, civil unrest, medical treatment, environmental incidents, accidents to employees and other persons other than their employees.

Emergency procedure shall be communicated to employees and a proof of such training shall be kept on file for reference. A list of emergency contact numbers shall be conspicuously displayed on site for ease reference. An evacuation plan shall be displayed in strategic places.

A contractor shall provide ACSA Safety with a full record of any incidents which may occur on site.

8.10 Incidents/Accidents Reporting and Investigation

A Contractor shall ensure that all incidents/accidents (this includes near miss, first aid cases and section 24 cases) are reported by employees immediately to the Construction Work Supervisor for further investigation and remedial action. A Contractor shall ensure that all section 24 incidents/accidents and incidents other than employees are reported to the Department of Labour immediately and preliminary investigation is conducted by a competent person within seven days. If construction work will be finished within 3 days after occurrence, an investigation shall be conducted before such construction work is ceased. Proof of such records shall be submitted to ACSA immediately or within 24 hours.

8.11 Personal Protective Clothing/Equipment

A contractor shall ensure that personal protective equipment or clothing needs analysis is conducted and incorporated into the risk assessment. Records shall be provided by the contractor prior commencement of construction work. A contractor shall ensure that SABS approved personal protective equipment or clothing is provided to personnel. The contractor shall ensure that no personnel are allowed to work on site without necessary personal protective equipment or clothing. A contractor shall ensure that PPE or Clothing is kept in good working order. A contractor shall clearly stipulate procedures to be followed when PPE or Clothing is lost or stolen, worn or damaged. ACSA shall remove any person from construction site who is working without necessary personal protective equipment and/or clothing. Worn or tattered personal protective clothing shall not be permitted on airport premises.

9. GENERAL ADMINISTRATIVE HEALTH & SAFETY REQUIREMENTS

9.1 Roof Work

A contractor shall ensure that all necessary health and safety precautions stated in the General Safety Regulations and Construction Regulations are taken into consideration when conducting any roof work. A contractor shall ensure that no person(s) is /are permitted to work on roof during inclement weather conditions.

9.2 Structure

A contractor shall provide ACSA with necessary precautionary safety measures to be taken as stipulated in Construction Regulation 9 to obviate any uncontrolled collapse of new structure or existing structure or any part thereof which may become unstable or is in temporary state of weakness or instability due to carrying out of construction work.

9.3 Designer

The Designer shall conduct regular inspections to ensure that a contractor is erecting a structure according to the designs and records of inspections shall be kept on site for reference. The frequency of inspections shall be determined by the nature of construction.

A designer can stop any contractor from executing any construction work which is not in accordance with the relevant design. A certificate of commissioning shall be issued by the designer after completion of structure.

9.4 Scaffolding Erection/Dismantling

A contractor shall ensure that scaffolding is erected and dismantled under the supervision of a competent person. A letter of appointment of the scaffold erector and inspector and their proof of competency shall be provided prior commencement of work. A contractor shall ensure that all safety standards stipulated in Construction Regulation 2003 are adhered to.

A proof of weekly inspections and inspection conducted after inclement weather shall be kept on file for reference.

9.5 Excavation Work

A contractor shall ensure excavation work is conducted under supervision of a competent person who has been appointed in writing. A letter of appointment shall be provided to ACSA Safety prior commencement of work. A risk assessment outlining safe work procedures to be adhered to if excavation is more than 1.5m deep must be provided to ACSA prior commencement of work. A contractor shall ensure that no person works in an excavation which is not adequately braced or shored.

A contractor shall ensure that every excavation including bracing and shoring are inspected daily prior each shift starts and such records are kept on site for reference.

A contractor shall ensure that all precautionary measure as stipulated for confined spaces as stated in the General Safety Regulation of OHS Act 85/1993 are complied with when entering any excavation. A contractor shall ensure that warning signs are conspicuously displayed where

excavation work involves the use of explosives and a method statement developed by a competent person is provided to ACSA prior commencement.
A contractor shall ensure that safe and convenient means of access is provided to every excavation when required. Such access shall not be further than 6m from the point where any worker within the excavation is working.

A contractor shall communicate, train and enforce safe work procedures pertaining to excavation work to his/her employees.

9.6 Demolition Work

A contractor shall ensure that a detailed structural engineering survey is conducted by a competent person and a method statement on the procedure to be followed is provided to ACSA Safety. A contractor shall ensure that demolition work is conducted under the supervision of a competent person appointed in writing, and in accordance to Construction regulation 12 of OHS Act 85/1993.
A contractor shall ensure that safety precautionary measures stipulated in Asbestos Regulations is adhered to if demolition work involves asbestos material and that asbestos work is conducted under the supervision of a registered Asbestos Contractor.

9.7 Explosive Power Tools

A contractor shall ensure that no person uses explosive power tools unless they have been properly trained, tools are properly guarded and inspected daily before use by a competent person who has been appointed in writing. A proof of such appointment and competency is kept on file for reference. A contractor shall ensure that warning signs are conspicuously displayed when explosive power tools are in use. A contractor shall ensure that all safety precautions are adhered to as stipulated in the Explosive Regulations and Construction Regulations

9.8 Portable Electrical Tools and Electrical Installation

A contractor shall ensure that all portable electrical tools are properly maintained, inspected before use by a competent person who is appointed in writing to perform such duties.

A contractor shall ensure that the electrical power tools are provided with earth leakage protection and are of double insulated type.

A contractor shall ensure that portable electrical tools are numbered and identified and entered onto a register. Regular inspections shall be recorded onto a register and kept on site.

A contractor shall ensure that prior notice is given to ACSA Electrical Engineer of any work involving electrical isolation. A lock-out certificate shall be issued to the relevant Contractor. A contractor shall ensure that a lock-out procedure is adhered to by his/her employees whenever required. A contractor shall ensure that safety measures stipulated in the Electrical Installation Regulations, Machinery Regulations, General Machinery Regulations and Construction Regulations are adhered to at all times.

9.9 Lifting Equipment, Tackle, Material Hoist & Cranes

A contractor shall ensure that all lifting equipment and tackle is inspected before use and a monthly register is completed by a competent person. Proof of such inspections shall be recorded and kept on file for reference. A contractor shall ensure that a safe working load is conspicuously displayed on lifting equipment and tackle and service certificate is provided prior commencement of work. A contractor shall ensure operators are properly trained on how to operate the above-mentioned equipment and a proof of competency is provided prior commencement of work.

A Contractor shall provide information on procedures to be followed in the case of:
(a) the malfunctioning of equipment; and
(b) the discovery of a suspected defect in the equipment

A contractor shall ensure that safety measures stipulated in Driven Machinery Regulation and Construction Regulation with regard to above equipment are adhered to at all times.

9.10 Ladders

A contractor shall ensure that all ladders are numbered, inspected before use and weekly inspections are recorded in a register. A contractor shall ensure that a competent person who carries the above inspections is appointed in writing.

9.11 Storage of Flammable Liquids

A contractor shall ensure that a competent person is designated in writing to control the storage and usage of Hazardous Chemical Substances (HCS). A letter of appointment shall be provided prior commencement of construction work.

A contractor shall ensure that material safety data sheets (MSDS) of chemical substances brought on site are kept on site and such documents have been communicated to the chemical substance users and First Aiders.

A contractor shall ensure that safety measures stated in Hazardous Chemical Substances Regulations, General Safety Regulation, Construction Regulation and Community Safety Fire By-law are applied at all times.

9.12 Vessels under Pressure

A contractor shall ensure that vessels under pressure are identified, numbered and entered in a register. A contractor shall ensure that a competent person is designated to supervise the use and maintenance of vessels under pressure. A contractor shall ensure that inspections are carried out and test of certificates are available and kept on file.

9.13 Employees exposed to excessive noise

A contractor shall ensure that all employees exposed to excessive noise (equal or above 85 dB (A) have undergone a baseline audiometric test prior commencement of construction work and SABS approved ear protection is provided and worn at all times.

9.14 Stacking and Storage

A contractor shall ensure a competent person is appointed in writing with a duty of supervising all stacking and storage on a construction work or site. A proof of such appointment shall be provided prior commencement of construction work. A contractor shall ensure that stacking is conducted under supervision and good housekeeping is maintained at all times

9.15 Ablutions/Changing/Eating Facility

A contractor shall ensure that sufficient shower, sanitary, changing facilities for each sex and sheltered eating area(s) are provided for the employees. The above facilities must be kept in a clean, hygiene, safe condition and in good state of repair.

9.16 Housekeeping on Sites

A contractor shall ensure that good housekeeping is maintained and enforced at all times. A contractor shall ensure that safety precautionary measures stipulated in Environmental Regulations for Workplaces and Construction Regulations and Construction Environmental Specification are adhered to at all times.

9.17 Public Safety & Security

A contractor shall ensure that notices and signs are conspicuously displayed at the entrance and along the perimeter fence indicating “No Unauthorised Entry”, “Visitors to report to office”, “helmet and safety shoes” etc.
Health and safety signage must be well maintained throughout the project. This shall entail cleaning, inspection and replacement of missing or damaged signage.

A contractor shall ensure that nets, canopies, fans etc. are provided to protect the public passing or entering the site. A contractor shall ensure that Security guard is provided where

necessary and provided with a way of communication and an access control measures or register is in place.

A contractor shall ensure that all visitors to a construction site undergo health and safety induction pertaining to the hazards prevalent on the site.

9.18 Night Work

A contractor shall ensure that necessary arrangements have been made with ACSA before conducting any night work. A contractor shall ensure that there is adequate lighting for any work conducted at night and failure to do so shall result in work being stopped.

9.19 Hot Work

A contractor shall ensure that ACSA Fire & Rescue Department is notified of any hot work to be conducted during construction work. A hot work permit accompanied with a gas free certificate shall be issued to the relevant contractor by ACSA Fire & Rescue Department when satisfied that the area is safe and that the Contractor understands the procedure. A contractor shall ensure that a hot work procedure is adhered to at all time by his/her employees.

9.20 Construction Vehicles

A contractor shall ensure that all construction vehicles are maintained in a good working order, regular inspections are conducted and such records are kept on site. A contractor shall ensure that construction vehicle(s) is/are operated by only certified competent and authorised persons. A contractor shall ensure that s/he complies with the safety measures stipulated in Construction Regulation (July 2003) and National Road Transport Regulations, 2000.

9.21 Hired Plant and Machinery

A contractor shall ensure that any hired plant and/or machinery brought to site is inspected by a competent person before use and records confirming that it is safe for use are provided prior usage of such equipment. A contractor shall ensure that such plant or machinery complies with the requirements of the Occupational Health & Safety Act. A contractor shall ensure that hired operators receive induction prior commencement of work. A contractor shall ensure that hired operators have proof of competency. A Contractor shall provide information on procedures to be followed in the case of:

(a) the malfunctioning of equipment; and
(b) the discovery of a suspected defect in the equipment

9.22 Road Construction Work

A contractor shall ensure that construction work conducted on the public road all necessary caution signage, cones, flag man etc. are provided as stipulated in the Road Traffic Ordinance is adhered to. The caution signage to be conspicuously displayed to warn the drivers of any construction work ahead shall be provided at least at 75 m away from the cones; flag man; actual construction works etc.

9.23 Edge protection and penetration

A contractor shall ensure that all exposed edges and floor openings are guarded and demarcated at all times until permanent protection has been erected. Guardrails used for edge protection must be 500mm and 900mm apart (double railing) above the platform/ floor surface. The Principal contractors fall protection plan must include the procedure to be followed regarding the management of edge protection and penetration.

9.24 Cantilevered loading platforms

Should these be used, a design certificate issued by a competent person must be made available, indicating a maximum safe work load, the erection and maintenance procedures. Requirements and provisions of SANS 10085-1:2004 regarding loading platforms shall be adhered to by the relevant contractor.

9.25 Formwork and support work

A Principal contractor and its contractors shall ensure compliance with the provisions made in terms of section 10 of Construction Regulation July 2003. These provisions must include but not limited to examining formwork and support work suitability before use, and inspection of formwork and support work structures on a daily basis until such time when formwork and support work structure have been removed. Records of all inspections must be kept in a register and made available to a Client, client representatives etc.

Public must be protected from any risk, and an alternative pedestrian and vehicle movement will be required when the risk prevails.

9.26 Suspended platforms

Should these platforms be used, the requirements and provisions of Construction regulation (July 2003) shall become applicable to a relevant contractor. These provisions shall include but not limited to use of safety harness as a fall prevention device by each person who will be on such platform. Such person using harness on a suspended platform shall at all times be attached to an anchoring point, suspended platform, or to any other secured structure.

9.27 Batch Plants

Should a batch plant be used, it shall conform to the requirements as set out on Construction regulation (July 2003) of OHS Act 85/93. These shall include but not limited to appointment of a competent person to operate and supervise batch plant operations.

9.28 Confined Space entry

A contractor shall ensure that all necessary health and safety provisions prescribed in the General Safety Regulations are complied with when entering confined spaces.

10. OCCUPATIONAL HEALTH MEDICAL SERVICES

A contractor shall ensure that when a hazard identification and risk assessment (HIRA) is conducted occupational health hazards are clearly identified and health & hygiene measures are clearly outlined to ensure compliance. A contractor shall ensure that where certificate of fitness is required is provided prior commencement of construction work.
A contractor shall be provided with a number to be used for medical emergencies.

11. LIQUOR, DRUGS, DANGEROUS WEAPONS, FIREARMS

A contractor shall ensure that no person is allowed on site that appears to be under the influence of intoxicating liquor or drugs. A contractor shall encourage his/her workforce to disclose the medication that poses a health and safety threat towards his/her fellow employees. No person shall be allowed to enter the site and work if the side effects of such medication do constitute a threat to the health or safety of the person concerned or others at such workplace. No dangerous or firearms allowed on construction site.

12. INTERNAL/EXTERNAL AUDITS

A contractor shall conduct monthly safety, health and environment audits and such records shall be kept on site. A contractor shall ensure that corrective measures are taken to ensure compliance.

ACSA shall conduct regular audits and defects noted shall be reported to the relevant contractor for remedial action. Inspections shall be conducted by ACSA and non-conformances noted shall be recorded and provided to the relevant contractor for remedial action. ACSA shall stop any contractor from executing any construction work which is not in accordance with the health and safety plan.

A contractor shall ensure that all necessary documents stipulated in this document are kept on the health and safety file and made available when requested.

13. PENALTIES

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Penalties shall be imposed by ACSA on Contractors who are found to be infringing these specifications, legislation and safety plans. The Contractor shall be advised in writing of the nature of the infringement and the amount of the penalty. The Contractor shall determine how to recover the fine from the relevant employee and/or sub-contractor. The Contractor shall also take the necessary steps (e.g. training) to prevent a recurrence of the infringement and shall advise ACSA accordingly.

The Contractor is also advised that the imposition of penalties does not replace any legal proceedings the Council, authorities and land owners.

Penalties shall be between R200 and R20 000, depending upon the severity of the infringement. The decision on how much to impose will be made by the ACSA SHE Representative, and will be final. In addition to the penalties, the Contractor shall be required to make good any damage caused as a result of the infringement at his/her own expense.

The preliminary list below outlines typical infringements against which ACSA may raise penalties; however, this list must not be construed as final:

- Failure to keep a copy of OHSACT on site.
- Failure to maintain an up-to-date letter of good standing with the Compensation Commissioner /FEM.
- Working on site without attending Safety Induction Training.
- Failure to conduct Safety Induction for personnel and visitors on site.
- Failure to issue and wear Personal Protective Clothing and Equipment.
- Failure to fully stock first aid box in accordance to the risks identified.
- Failure to disclose or report first aid cases and /or minor/major/fatalities as prescribed by the OHSACT.
- Failure to adhere to written safe work procedure as stipulated in the Hazard Identification and Risk Assessment and safety plan.
- Failure to maintain records and registers as per the OHS Act of 1993 and its regulations.
- Failure to conduct audits and inspections as required by legislation.
- Keeping un-serviced fire equipment on site.
- Failure to make use of ablution facilities.
- Failure to remove personnel on site who appears to be under the influence of intoxicating liquor or drugs.
- Failure to close out previously raised non-conformances.
- Failure to make and update legislative appointments.
- Failure to adhere to the OHS Act of 1993 and its regulations.

I, _____ (name & surname) of _____(company)

Agree to the above conditions and acknowledge ACSA's right to impose penalties should I or any of my employees or sub-contractors fail to comply with these conditions.

Signed: _____ on this date: _____
(dd/mm/yyyy)

at: _____ (airport name).

14. MEASUREMENT AND PAYMENT

In tendering rates for these items, the Contractor shall ensure that the sum of the amounts of the four items shall not be less than one per cent (1%) of the Work Value of the Tender
(Total: Schedules A to C).

Item		Unit
8001	**Contractor's initial obligations in respect of the Occupational Health and Safety Act and Construction Regulations**	.....Lump Sum

The full amount will be paid in one instalment only once:-

(a) The Contractor has notified the Provincial Director of the Department of Labour in writing of the project.

(b) The Contractor has made the required initial Appointments of Employees and Sub-Contractors.
(c) The Client has approved the Contractor's Health and Safety Plan.
(d) The Contractor has set up his Health and Safety File.

Item		Unit
8002	**Contractor's time related obligations in respect of the Occupational Health and Safety Act and Construction Regulations**	.....Month

The tendered rate shall represent full compensation for that part of the Contractor's general obligations in terms of the Occupational Health and Safety Act and the Construction Regulations which are mainly a function of time. The sum will be paid per month only after all aspects under item 8001 have been submitted in writing for approval and approved by the OHS representative or engineer. This item shall also cover all updates of the files, plans and reports associated with the Occupational Health and Safety Act and the Construction Regulations.

Item		Unit
8003	**Provision of full time Construction Safety Officer**	.....Month

The tendered sum shall include for the cost of a construction safety officer on a full time basis, his overheads, transport and all others items necessary for the proper carrying out of his duties. The sum will be paid per month only after all aspects under item 8001 and proposed Safety Officer have been submitted in writing and approved by the OHS representative or engineer.

Item		Unit
8004	**Submission of the Health and Safety File**	.....Lump Sum

This amount will be paid only once the Contractor has met all his obligations in respect of the Occupational Health and Safety Act and the Construction Regulations and has submitted his Health and Safety File complete as envisaged on this specification to the Client's satisfaction. This must be done prior to the issue of a Certificate of Completion

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ANNEXURE A

NOTIFICATION OF CONSTRUCTION WORK
Regulation 3 of the Construction Regulations, 2003

1. (*a*) Name and postal address of principal Contractor:

   (*b*) Name and telephone number of principal Contractor's contact person:

2. Principal Contractor's compensation registration number:

3. (*a*) Name and postal address of Client:

   (*b*) Name and telephone number of Client's contact person or agent:

4. (*a*) Name and postal address of designer(*s*) for the project:

   (*b*) Name and telephone number of designer's contact person:

5. Name and telephone number of principal Contractor's construction supervisor on site appointed in terms of regulations 6 (1):

6. Name/s of principal Contractor's sub-ordinate supervisors on site appointed in terms of regulation 6 (2):

7. Exact physical address of the contruction site or site office:

8. Nature of the construction work:

9. Expected commencement date: .....

10. Expected completion date: .....

11. Estimated maximum number of persons on the construction site:

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12. Planned number of Contractors on the construction site accountable to principal Contractor:

13. Name(*s*) of Contractors already chosen:

Principal Contractor *Date*

Client *Date*

- THIS DOCUMENT IS TO BE FORWARDED TO THE OFFICE OF THE DEPARTMENT OF LABOUR **PRIOR TO COMMENCEMENT** OF WORK ON SITE.
- **ALL PRINCIPAL CONTRACTORS** THAT QUALIFY TO NOTIFY MUST DO SO EVEN IF ANOTHER PRINCIPAL CONTRACTOR ON THE SAME SITE HAD DONE SO PRIOR TO THE COMMENCEMENT OF WORK.

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ANNEXURE B

RECORDS TO BE KEPT ON SITE

ITEM	CR	RECORD TO BE KEPT	RESPONSIBLE PERSON
1.	3(3)	Notification to Provincial Director – Annexure A Available on site	Contractor
2.	4(3)	Copy of Principal Contractor's Health & Safety Plan Available on request	Client (Consultant)
3.	5(6)	Copy of Principal Contractor's Health & Safety Plan As well as each Contractor's Health & Safety Plan Available on request	Principal Contractor
4.	5(7)	Health & Safety File opened and kept on site (including all documentation-required i.t.o. OHSA & Regulations Available on request	Contractor
5.	5(8)	Consolidated Health & Safety File handed to Client on completion of Construction work. To include all documentation required i.t.o. OHSA & Regulations and records of all drawings, designs, materials used and similar information on the structure.	Contractor
6.	5(9)	Comprehensive and Updated List of all Contractors on site, the agreements between the parties and the work being done Included in Health & Safety file and available on request	Contractor
7.	6(7)	Keep record on the Health & safety File of the input by Construction Safety Officer [CR 6 (6)] at design stage or on the Health & Safety Plan	Contractor
8.	7(2)	Risk Assessment Available on site for inspection	Contractor
9.	7(9)	Proof of Health & Safety Induction Training	Every Employee on site
10.	8(3)	Construction Supervisor [CR 6 (1)] has latest updated version of Fall Protection Plan [CR 8 (1)]	Contractor
11.	9(2)(b)	Inform Contractor in writing of dangers and hazards relating to construction work	Designer of Structure
12.	9(3)	All drawings pertaining to the design of structure On site available for inspection	Contractor
13.	9(4)	Record of inspection of the structure [First 2 years – once every 6 months, thereafter yearly]	Owner of Structure
14.	9(5)	Maintenance records – safety of structure Available on request	Owner of Structure
15.	10(1)(d)	Drawings pertaining to the design of formwork/support work structure Kept on site, available on request	Contractor
16.	11(3)(h)	Record of excavation inspection On site available on request	Contractor
17.	15(11)	Suspended Platform inspection and performance test records Kept on site available on request	Contractor
18.	17(8)(c)	Material Hoist daily inspection entered and signed in record book kept on the premises	Contractor
19.	17(8)(d)	Maintenance records for Material Hoist Available on site	Contractor
20.	18(9)	Records of Batch Plant maintenance and repairs On site available for inspection	Contractor



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21.	19(2)(g)(ii)	Issuing and collection of cartridges and nails or studs (Explosive Powered Tools) recorded in register – recipient signed for receipt as well as return	Contractor
22.	21(1)(d)	Findings of daily inspections (prior to use) of Construction Vehicles and Mobile Plant	Contractor
23.	22(d)	Record of temporary electrical installation inspections [once a week] and electrical machinery [daily before use] in a register and kept on site	Contractor
24		Copies of all appointments made in regard to safety supervisors and inspectors	

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ANNEXURE C

OCCUPATIONAL HEALTH AND SAFETY AUDIT SYSTEM

ADMINISTRATIVE & LEGAL REQUIREMENTS

Subject	• Requirements	Yes/ No
Notice of carrying out Construction work	Department of Labour notified Copy of Notice available on Site	
Copy of OH&S Act (Act 85 of 1993)	Updated copy of Act & Regulations on site Readily available for perusal by employees	
Registration with Compensation. Insurer	Written proof of registration / Letter of good standing available on Site	
OH&S Specification & Plan	OH&S Specification received from Client OH&S plan developed Updated regularly	
Hazard Identification & Risk Assessment	Hazard Identification carried out/Recorded Risk Assessment and Plan drawn up/Updated Risk Assessment Plan available on Site Employees/Subcontractors informed/trained	
Assigned duties (Managers)	Responsibility of complying with the OH&S Act assigned to other person/s by CEO.	
Designation of Person Responsible on Site	Competent person appointed in writing as Construction Supervisor	
Designation of Subordinate Person	Competent person appointed in writing as Sub-ordinate Construction Supervisor	
Designation of Occupational Health & Safety Representatives	More than 20 employees - one OH&S Representative, one additional OH&S Rep. for each 50 employees or part thereof. Designation in writing, period and area of responsibility specified. Meaningful OH&S Rep. reports. Reports actioned by Management.	
Occupational Health & Safety Committee/s	OH&S Committee/s established. Members appointed in writing. Meetings held monthly. Minutes kept. Actioned by Management.	
Agreement with Mandatories (Subcontractors)	Written agreement with Subcontractors. List of Subcontractors displayed. Proof of Registration with Compensation Insurer/Letter of Good Standing Construction Work Supervisor designated Written arrangements concerning OH&S Reps & OH&S Committee Written arrangements regarding First Aid	
Fall Prevention & Protection	Competent person appointed to draw up and supervise the Fall Protection Plan Proof of appointees' competence available on Site Risk Assessment carried out for work at heights Fall Protection Plan drawn up/updated Available on Site	



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Inspection & Maintenance of Electrical Installation & Equipment (including portable electrical tools)	Competent person appointed in writing to inspect/test the installation and equipment. Written Proof of Competence of above appointee available on Site. Inspections: - Electrical Installation & equipment inspected after installation, after alterations and quarterly. Inspection Registers kept Portable electric tools and -lights and extension leads identified/numbered. Monthly visual inspection by User/Issuer/ Store man. Register kept.	

Water Environments	Competent person appointed in writing to supervise diving operations and ensure maintenance, statutory inspection and testing by an Approved Inspection Authority of equipment used Written Proof of Competence of above appointee available on Site Proof of registration of all divers' present on site available Risk Assessment carried out Diving Manual produced. Available on Site Record of Voice Communications kept Diving Operations record kept Each Diver keeps a personal logbook. Entries countersigned by the Diving Supervisor Decompression tables available on Site Records of any Decompression illness kept Certificate of Manufacture of any Compression Chamber or Diving Bell in use available on Site	
Designation of Stacking & Storage Supervisor.	Competent Person/s with specific knowledge and experience designated to supervise all Stacking & Storage Written Proof of Competence of above appointee available on Site	
Designation of a Person to Co-ordinate Emergency Planning And Fire Protection	Person/s with specific knowledge and experience designated to co-ordinate emergency contingency planning and execution and fire prevention measures Emergency Evacuation Plan developed: Drilled/Practiced Plan & Records of Drills/Practices available on Site Fire Risk Assessment carried out All Fire Extinguishing Equipment identified and on register. Inspected weekly. Inspection Register kept Serviced annually	
First Aid	Every workplace provided with sufficient number of First Aid boxes. (Required where 5 persons or more are employed) First Aid freely available Equipment as per the list in the OH&S Act. One qualified First Aider appointed for every 50 employees. (Required where more than 10 persons are employed) List of First Aiders and Certificates Name of person/s in charge of First Aid box/es displayed. Location of F/Aid box/es clearly indicated. Signs instructing employees to report all Injuries/illness including first aid injuries	

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Personal Safety Equipment (PSE)	PSE Risk Assessment carried out Items of PSE prescribed/use enforced Records of Issue kept Undertaking by Employee to use/wear PSE	
*Inspection & Use of Welding/Flame Cutting Equipment	Competent Person/s with specific knowledge and experience designated to Inspect Electric Arc, Gas Welding and Flame Cutting Equipment Written Proof of Competence of above appointee available on Site Equipment identified/numbered and entered into a register Equipment inspected monthly. Inspection Register kept	
*Control of Storage & Usage of HCS	Competent Person/s with specific knowledge and experience designated to Control the Storage & Usage of HCS Written Proof of Competence of above appointee available on Site Risk Assessment carried out Register of HCS kept/used on Site	
Vessels under Pressure (VUP)	Competent Person/s with specific knowledge and experience designated to supervise the use, storage, maintenance, statutory inspections & testing of VUP's Written Proof of Competence of above appointee available on Site Risk Assessment carried out Certificates of Manufacture available on Site Register of VUP's on Site Inspections & Testing by Approved Inspection Authority (AIA): after installation/re-erection or repairs every 36 months. Register/Log kept of inspections, tests. Modifications & repair	
Construction Vehicles & Earth Moving Equipment	Operators/Drivers appointed to: Carry out a daily inspection prior to use Drive the vehicle/plant that he/she is competent to operate/drive Written Proof of Competence of above appointee available on Site Record of Daily inspections kept	
Inspection of Ladders	Competent person appointed in writing to inspect Ladders Ladders inspected at arrival on site and monthly thereafter. Inspections register kept	
Ramps	Competent person appointed in writing to Supervise the erection & inspection of Ramps. Inspection register kept.	

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Roof work	Competent person appointed to plan & supervise Roof work. Proof of appointees' competence available on Site Risk Assessment carried out Roof work Plan drawn up/updated Roof work inspect before each shift. Inspection register kept Employees medically examined for physical & psychological fitness. Written proof available	
Structures	Information re. the structure being erected received from the Designer including: - geo-science technical report where relevant - the design loading of the structure - the methods & sequence of construction -anticipated dangers / hazards / special measures to construct safely Risk Assessment carried out Method statement drawn up All above available on Site Structures inspected before each shift. Inspections register kept	
Formwork & Support work	Competent person appointed in writing to supervise erection, maintenance, use and dismantling of Support & Formwork Design drawings available on site Risk Assessment carried out Support & Formwork inspected: - before use/inspection - before pouring of concrete - weekly whilst in place - before stripping/dismantling. Inspection register kept	
Scaffolding	Competent persons appointed in writing to: - erect scaffolding (Scaffold Erector/s) - act as Scaffold Team Leaders - inspect Scaffolding weekly and after inclement weather (Scaffold Inspector/s) Written Proof of Competence of above appointees available on Site Copy of SABS 085 available on Site Risk Assessment carried out Inspected weekly/after bad weather. Inspection register/s kept	
Suspended Scaffolding	Competent persons appointed in writing to: - erect Susp. scaffolding (Scaffold Erector/s) - act as Susp. Scaffold Team Leaders - inspect Susp. Scaffolding weekly and after inclement weather (Scaffold Inspector/s) Risk Assessment conducted Certificate of Authorization issued by a registered professional Engineer available on Site/copy forwarded to the Department of Labour The following inspections of the whole installation carried out by a competent person - after erection and before use - daily prior to use. Inspection register kept The following tests to be conducted by a competent person: - load test of whole installation and working parts every 12 months - hoisting ropes/hooks/load attaching devices quarterly. Tests log book kept Employees working on Susp. Scaffold medically examined for physical & psychological fitness. Written proof available	

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Excavations	Competent person/s appointed in writing to supervise and inspect excavation work Written Proof of Competence of above appointee/s available on Site Risk Assessment carried out Inspected: - before every shift - after any blasting - after an unexpected fall of ground - after any substantial damage to the shoring - after rain. Inspections register kept Method statement developed where explosives will be/ are used	
Demolition Work	Competent person/s appointed in writing to supervise and control Demolition work Written Proof of Competence of above appointee/s available on Site Risk Assessment carried out Engineering survey and Method Statement available on Site Inspections to prevent premature collapse carried out by competent person before each shift. Inspection register kept	
Materials Hoist	Competent person appointed in writing to inspect the Material Hoist Written Proof of Competence of above appointee available on Site. Materials Hoist to be inspected weekly by a competent person. Inspections register kept.	
Caissons & Coffer dams	Competent person appointed in writing to supervise, control & inspect the construction, installation/dismantling of caissons/coffer dams Written Proof of Competence of above appointee available on Site Risk Assessment carried out to be inspected daily by a competent person. Inspections register kept	
Explosive Powered Tools	Competent person appointed to control the issue of the Explosive Powered Tools & cartridges and the service, maintenance and cleaning. Register kept of above Empty cartridge cases/nails/fixing bolts returns recorded Cleaned daily after use	
Batch Plants	Competent person appointed to control the operation of the Batch Plant and the service, maintenance and cleaning. Register kept of above Risk Assessment carried out Batch Plant to be inspected weekly by a competent person. Inspections register kept	
Tunnelling	Complying with Mines Health & Safety Act (29 of 1996) Risk Assessment carried out	
Cranes & Lifting Machines Equipment	Competent person appointed in writing to inspect Cranes, Lifting Machines & Equipment Written Proof of Competence of above appointee available on Site. Cranes & Lifting tackle identified/numbered Register kept for Lifting Tackle Log Book kept for each individual Crane Inspection: - All cranes - daily by operator -Tower Crane/s - after erection/6monthly - Other cranes - annually by comp. person - Lifting tackle (slings/ropes/chain slings Etc.) - 3 monthly Risk Assessment carried out	

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ANNEXURE D

- **HAZARDOUS TASK IDENTIFICATION**

- (The list given is not inclusive and other hazardous tasks may be identified as the construction progresses)

• **MAIN TASK**	• **SUB TASK**
•	•
• ACCOMMODATION OF TRAFFIC	• Clashes between Airport Fire and Safety traffic and construction work
•	• Dust (from jet blast)
•	• Traffic speed
•	• Provision of safety equipment
•	• Working next to air traffic (noise and jet blast)
•	• Erection of signage and barricades
•	•
• EARTHMOVING AND LAYERWORKS	• Use of tip trucks and other transportation
•	• Working at spoil site
•	•
• EXCAVATING	• By manual labour
•	• By excavating equipment e.g. Milling Machine
•	• Excavating duct slots by electrical/pneumatic breakers
•	•
• ELECTRICAL	• Working with generators and lighting
•	• Temporary installations
•	• Dealing with services provided by others
•	•
• FIRE	• Use and placement of fire extinguishers

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•	• Fire fighting
•	• Gas Screed heaters
•	• Hand held gas burners
•	• Notification of Fire & Safety
•	•
• MISCELLANEOUS	• Site Establishment
•	• Housekeeping
•	• General storage
•	• Movement of equipment
•	• Use of personal transport
•	•
• SURFACING	• Asphalt batch plant
•	• Use, storage and handling of bituminous products
•	• Distributors
•	• Spraying by hand
•	• Use of paving machines
•	• Use of rollers
•	• Use of heating apparatus
•	• Use of nuclear gauge
•	•
• WORKSHOPS	• Use of small electrical tools
•	• Gas and Flame Cutting
•	• Welding
•	• Use of general workshop equipment
•	• Tyre repair
•	• Use of jacking and lifting apparatus

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•	•
• HAZADOUS MATERIALS	• Petrol
• To be added to as required	• Diesel
• Materials safety date sheets as required	• Lubricants
•	• Cement and cement bags
•	• Road lime and lime bags
•	• Flammable materials
•	• Gas bottles
•	•
• ANY OTHER DANGEROUS ACTIVITIES IDENTIFIED BY THE CONTRACTOR	•
• To be added by the contractor at tender stage	•
•	•
•	•
•	•
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PART C5.2: PROCEDURE MANUAL FOR WORKING AIRSIDE

Airside Related

1. Scope

This procedure covers the manner in which all general airside activities are carried out at Business Units in order to ensure optimum safety at the lowest possible risk for all Employees, all stakeholders and clients.

2. Objective

To provide a safe working environment on the airside at all operated Airports

3. Definitions and Abbreviations

Apron Operations Permit
This is a permit issued to vehicles or ground service equipment by the Permit Office once a serviceability inspection has been conducted and approved by a Safety/ARFFS Officer

AHM
Airport Handling Manual

ARFFS
Aerodrome Rescue and Fire Fighting Services

ARFFV
Aerodrome Rescue and Fire Fighting Vehicle

ARFFVS
Aerodrome Rescue and Fire Fighting Vehicles

ATC
Air Traffic Control

ATV
All Terrain Vehicles

AVOP
Airside vehicle Operator Permit

FACT
Cape Town International Airport

FAEL
East London Airport

FAGG
George Airport



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Airside Related

FMC's
MainDeck and Lower Deck Loaders

FALE
King Shaka International Airport

FAOR
O. R. Tambo International Airport

Group/Organisation/Business
Airport Company South Africa SOC Limited

GSE
Ground Service Equipment

HOD
Head of Department

IATA
International Air Transport Association

NRTA
National Road Traffic Act

RFF
Rescue and Fire Fighting

SA CAA
South African Civil Aviation Authority

SWL
Safe Working Load

ULD
Unit Loading Device

4. Procedure General

Business Units are managed in a manner that ensures a safe working environment for all airport users. This procedure provides specific driving and operating requirements on the airside to prevent work-related accidents and incidents as well as fatalities, injuries and illness from occurring within our working environment.

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Airside Related

4.1 The following shall result in penalties being imposed by the organisation on any person who is found:

- Tampering with Emergency Fuel Stop buttons.
- Tampering with Fire Extinguishers or Fire Alarm Systems.
- Removing Fire Extinguishers without prior approval from the Group except in the event of an emergency.
- Tampering with or removing warning signage.
- Activating Emergency Fuel Stop buttons or Emergency Alarm systems in the absence of an Emergency.
- Littering on the airside at Business Units.
- Causing malicious damage to owned property, equipment or vehicles. Refer Aviation Safety Department Safety Enforcement System Procedure - B110 001M.

4.1.1 Use of runways when the operated Airport is closed

At Upington, Kimberley, Bram Fischer, East London and George Airports, it is permitted to land on the airport without ATC approval. The Airport Managers have approved landing using the radio click on. This is possible using the radio click on system installed at these airports. At all other operated Airports are not permitted to land without prior approval from Air Traffic Control.

4.2 Airside Driving Procedures

- Drivers/operators of vehicles on airside of any operated Airport shall be in possession of a valid Security Permit which shall be worn visibly and produced upon demand by the General Manager, Airport Manager or any other designated representative.
- Drivers/operators shall be in possession of a valid National Drivers Licence commensurate to the vehicle classification that is being driven.
- A driver/operator shall be issued with an AVOP depicting the area in which the driver/operator is licensed to operate.
- The issuance of an Airside Operator Permit is dependent upon the approved AVOP Compliance Record - SAF 037.
- Drivers/operators shall have normal colour vision and wear corrective lenses and/or hearing aids when driving, if such requirements are stipulated on their National Driving Licence issued by the National Department of Transport.
- Drivers/operators shall not exceed the stated limits which is as follows:
  - Service Road 30km/h
  - Perimeter road and along the airside boundary fence 60km/h
  - Back of stand 15km/h
- Drivers/operators of vehicles and ground servicing equipment shall comply with any instruction given by the General Manager, Airport Manager or his/her designated representative at all times.
- Drivers/operators of vehicles and ground servicing equipment shall only operate within the area of operation as approved by the Representative.
- Where the driver/operator has to operate beyond the approved areas, the necessary arrangements are to be made with the Representative.

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Airside Related

- Drivers/operators shall not operate a vehicle whilst under the influence of intoxicating substances.
- Drivers/operators shall not drive a vehicle or item of ground service equipment between passengers moving to or from an aircraft and shall give way to passengers at all times.
- Drivers/operators shall obey all road signs and markings in place around the airport. [Markings are not always accompanied by associated road signs]
- Drivers/operators shall follow the service roads provided for vehicular movements [apron service roads are delineated by white staggered lines].
- Drivers/operators shall not exceed slow walking pace on aircraft parking stands.
- Drivers/operators shall exercise extreme caution when in the proximity of an aircraft on an aircraft parking stand.
- Drivers/operators shall carry out a brake check bringing the vehicle or item of ramp handling equipment to a complete stop prior to entering the aircraft parking stand.
- Drivers/operators shall give way to emergency vehicles (ARFFS and Medical Response) responding to an emergency at all times.
- Drivers/operators of emergency vehicles do not have an automatic right of way to race blindly through robots, stop streets and pedestrian crossings and are therefore required to perform a rolling stop by proceeding through cautiously with all visual and audible emergency response warning devices activated. They shall be within controllable speed to still take evasive action and stop the vehicle immediately shall circumstances dictate to prevent a collision.
- Drivers/operators shall indicate when making a directional turn.
- Drivers/operators shall stop at stop signs.
- Drivers/operators and passengers in vehicles shall not smoke whilst on the airside.
- Drivers/operators shall only park vehicles and items of equipment in designated areas duly provided and marked by the Group for this purpose.
- Drivers/operators shall only enter Runways/Taxiways after receiving clearance from ATC.
- Drivers/operators of vehicles shall give way to aircraft at all times. This rule applies to aircraft taxiing on their own power as well as aircraft under tow.
- Drivers/operators of vehicles shall not overtake a taxiing aircraft.
- Drivers/operators of vehicles intending to cross any part of the movement area on the vehicular route shall come to a complete stop at the stop sign/ holding point and ensure that the section of the movement area being entered is clear of any moving aircraft.
- Drivers/operators shall avoid stopping their vehicles on the aircraft movement area and shall never leave a vehicle unattended outside of a designated parking area.
- Drivers/operators shall never drive vehicles or equipment into or stop at danger zones designated by red with white outline hatching.
- Drivers/operators and personnel operating on the apron shall be vigilant of jet efflux and air intake from aircraft start-ups, aircraft entering and leaving parking bays and take precautions to avoid such hazards.
- Drivers/operators of vehicles and mobile equipment shall not enter a parking bay in which an aircraft is moving, whether under its own power or being towed.
- Drivers/operators of vehicles/equipment shall not pass behind an aircraft when its

engines are running or the anti-collision beacons are activated.

- Vehicles and mobile equipment are not permitted to remain inside an aircraft parking bay unless they are engaged in or required for the ground operations of the aircraft.
- Drivers/operators shall not leave vehicles/equipment unattended with the engine running anywhere on airside.
- Except for forklift drivers, other drivers shall not drive in reverse unless the operation requires a driver to reverse such as positioning to and from an aircraft, in which case the driver shall make use of a guide-man/guide-person.
- When two (2) vehicles are converging inside parking bays, vehicles shall approach the aircraft with extreme caution and courtesy to other vehicles intending to manoeuvre around the aircraft. Drivers/operators of vehicles/equipment shall keep to the left when travelling on the vehicular routes. When two (2) vehicles are converging, the one on the left shall give way to the other, except where directed by Give Way signs.
- A vehicle overtaking another shall do so on the right side of the vehicle being overtaken.
- Passengers shall only be carried in vehicles which have a place provided for that purpose. The number of passengers carried shall not exceed that authorised on the vehicle licence.
- No tractor is allowed to tow dolleys, units or item of aircraft ground support equipment exceeding a total length of twenty-two (22) metres as contained in the NRTA. This is inclusive of the tractor used to tow. Depending on the size of the dolley, unit or aircraft ground support equipment equates to between four (4) and six (6) units.
- The driver/operator shall ensure that loads carried in the vehicle, container and on pallets are properly secured to prevent the load from being dislodged during movement. Extra caution shall be taken when high winds prevail.
- Drivers/operators of vehicles/equipment approaching an Airport Security Gate (from either landside or airside) shall stop in front of the drop arm barrier for a Security Check. The driver/operator shall not move forward until the drop arm barrier is fully raised and the driver/operator is directed to move on.
- Drivers/operators shall not use the vehicular access onto the apron as a short cut to reach another landside location.
- Refuelling, servicing and maintenance of vehicles/equipment on airside operational areas are strictly prohibited, except in areas specifically designated for such operational activities.
- Cognisance shall be taken of the fact that refuelling trucks/bowsers can stop at any given time if the brake interlocking system is activated.
- Drivers/operators shall at all times wear a retro reflective jacket when entering the airside.

Airside Related

4.2.1 O R Tambo International Airport Specific

On parking Stands C13 to C17 where restricted stand-by areas are provided, vehicles/GSE shall be staged in these areas in preparation for an aircraft arrival at the bay. The area in front and on both sides of an aircraft that is due to depart shall be cleared of all vehicles/GSE before the aircraft taxiing out of the bay.

- Use only vehicles which are less than 4.0m in height on the airside service road next to Alpha apron.
- Use only vehicles which are not in excess of 3.4m in height to gain access to the bus terminus under the airside corridor.
- Use only vehicles which are not in excess of 3.2m in height on the Northern Service Road of Charlie Apron.
- A quad bike utilized solely for the benefit of bird control is acceptable. The quad bike is required to comply with all the operational requirements and be issued with the relevant vehicle permits. The Bird and Wildlife Control Officer shall be in possession of a valid AVOP.

4.2.2 King Shaka International Airport Specific

- Quad bikes/ATV utilised solely for the benefit of bird control or fire department duties are acceptable. The quad bike/ATV is required to comply with all the operational requirements and be issued with the relevant vehicle permits. Note: FALE has quad bikes/ATV for bird and wildlife control as well as an ATV with skid pump for minor ARFFS response to fires, spills, etc.
- The Bird and Wildlife Control Officer/ fire fighter shall be in possession of a valid AVOP. Refer to the Operations Department Airside Vehicle Operator Permit Procedure - B150 001M
- The emergency access road extending from the fire station onto and beyond the runway is only to be used for bona fide emergency response. This road is barricaded by frangible plastic chains, that prevents inadvertent incursions, whilst allowing emergency responding ARFFVS to drive through the frangible chains when responding to actual emergencies on the airfield
- Permission from ATC shall be gained when entering any part of the manoeuvring area as documented in the emergency response procedures. Refer Aerodrome Rescue and Fire Fighting Services Department Emergency Medical Response on Airside Procedure – C060 003M Once the frangible chain/s has been broken during an emergency response, the access onto the manoeuvring areas beyond the chains shall be secured and controlled by security personnel, until emergency controlled access is no longer required and the chains are re-installed.
- FALE ARFFS shall ensure that sufficient spare plastic frangible chains are kept in stock to immediately re-secure the barricades once broken during emergency response
- For purposes of training, escorting of contractors, manoeuvring area inspections/patrols, etc. the perimeter service road shall be used

- Refer Operations Department Airside Vehicle Operator Permit Procedure - B150 001M

4.2.3 Cape Town International Airport Specific

- A quad bike utilized solely by the ARFFS Department for the benefit of bird and wild life control is acceptable. The quad bike is required to comply with all the operational requirements and be issued with the Apron Operations Permit. The ARFFS Officer operating the quad bike shall be in possession of a valid AVOP.
- Drivers/operators shall take cognizance that aircraft always have the right of way.
- Taxiway Crossing from A17 to B10 or from B10 to A17
  - Due to the wingtip clearance between the service road and the wingtip of the aircraft powering in or out of B10 aircraft parking bay, all drivers operating on the taxiway service road crossing from A17 to B10 or from B10 to A17 shall give way to aircraft arriving and departing from aircraft parking bay B10, these vehicles shall stop at A17 or at the T – Junction between B9 and B10
  - No vehicles shall cross the taxiway from A17 to B Apron when an aircraft is being marshalled into B10 until the anti-collision lights of the aircraft have been switch off, or when the aircraft parked at B10 has the anti-collision lights on in preparation to taxi out or when taxiing out.
  - Any aircraft parked on B10 with the aircraft anti - collision lights on indicates that the aircraft is operational and all vehicles are to stop at A17 until the aircraft has departed or switched off its anti-collision lights
  - Cognisance shall be taken of the effects of jet blast on both vehicles and equipment.
- Drivers/operators using the service road from A3 to Foxtrot Apron or vice versa shall observe aircraft movements before proceeding onto this section of this service road for Code E and F aircraft. Due to the aircraft wing and engine overhang in this area.
  - Code E Aircraft operating into FACT
    There are a number of Code E aircraft that operate into FACT which include, but not limited to B747, B777, B767, A330, A340 and MD11.
  - Code F aircraft using FACT Airport
    FACT is not Code F compliant and generally such operations shall not be permitted. All Code F operations into FACT shall be subject to SA CAA approval.
- Use of guides man at C (Charlie) Boarding gates
  - All bus operators on airside shall at all times have a guides man present when positioning busses at the C Gates.

- All Ground Handlers operating at the Baggage make-up area shall:
  - Park dollies only within designated areas
  - Maintain driving speed of 5KM/H (Walking pace)
  - Only tow 3 units of dollies
  - All stipulated guidelines and driving regulation to be adhered to.

4.3 Airside Vehicle Procedures

- All vehicles and items of ramp handling equipment on airside of operated Airports shall have an Apron Operations Permit displayed on the vehicle.
- All vehicles/equipment operated on airside of operated Airports are subject to both annual and ad hoc inspections by the Group.
- Vehicle and equipment are subjected to a serviceability inspection prior to the application of an Apron Operations Permit for vehicles or equipment.
- All motorised vehicles and self-powered equipment used for aircraft servicing purposes shall be equipped with serviceable fire extinguisher(s).
- This is applicable to all vehicles and equipment that are required to cross the restraint line to service an aircraft on a parking bay.

4.4 Airside Procedures for pedestrians

4.4.1 Permit Holders

Pedestrians on airside shall adhere to the following regulations:

- Never walk across aprons except at designated crossing points.

Wear retro reflective jacket as specified in the:

- Aviation Safety Department Airside Personal Protective Equipment Procedure - B080 001M
- Never run on aprons.
- Always be aware of moving vehicles or equipment in the area.
- Never stand close to an aircraft engine on start up or shut down.

4.4.2 Passengers

Passengers shall always be under the supervision of the airline, aircraft owner, aircraft operator or ground handling agency staff. Passengers on airside of operated Airports are the responsibility of the airline, aircraft owner or aircraft operator.

4.4.3 Visitors

- Visitors shall always be under the escort of an approved Security Permit Holder.
- They shall be issued with a Visitor Security Permit which shall be worn in the prescribed manner.
- Visitors shall adhere to the procedures as laid down in the section titled Permit Holders.

4.5 Apron Procedures

4.5.1 These procedures are applicable to all vehicles, equipment and personnel using the apron:

- Vehicles/equipment shall only enter/exit the airport perimeters through approved entrances and exits.
- Personnel shall wear their Security Permits visibly at all times.
- Smoking is not permitted outside designated areas on airside of any operated Airport. Smoking in vehicles is not permitted.
- Any unserviceable vehicle/equipment shall immediately be removed from airside. Under no circumstances shall the vehicle/equipment be used on the apron until defect rectification has been carried out and approved for re-entry onto the airside by the designated representative
- At sundown all vehicles on airside shall have their lights switched on (two (2) white lights at the front and two (2) red lights at the rear).
- When trailers are being towed, drivers/operators shall ensure that the trailers are properly coupled with safety pins in position.
- Passengers shall not be transported in or on any vehicle not licensed or equipped for the purpose.
- Vehicles and equipment shall always give way to aircraft whether taxiing or being towed.
- Vehicles and equipment shall keep left to oncoming traffic.
- Vehicles, equipment and personnel are not allowed to pass in front of, or behind a marshaller directing/marshalling an aircraft.
- Vehicles and equipment shall not move across an aircraft parking bay while an aircraft is being positioned or preparing to depart.
- Vehicles and equipment shall move from one aircraft parking bay to another via the service road.
- Vehicles and equipment (except fork lifts) shall not reverse on the apron except to:
  - position at a loading ramp (a guide-man is required)
  - position at an aircraft (a guide-man is required)
  - hook-up trailers
- With the exception of emergency and refuelling vehicles, vehicles/equipment shall not be driven under or be parked under an aircraft or any part of it.
- When vehicles/equipment are positioning around an aircraft, drivers shall ensure that:
  - There is enough space near the wing, tail and fuselage to move vehicles and equipment
  - Anti - collision beacons have been switched off, aircraft engines are shut down, propellers have stopped and chocks are in place before they approach the aircraft
  - They move their vehicles and equipment under strict control of a guide-man positioned outside the vehicle and in full view of the driver. The guide-

man is to position himself so that he can see all areas and the driver has to obey all signals given to him/her by the guide-man

- All vehicles shall come to a complete stop prior to entering the demarcated area or within fifteen (15) metres from the aircraft in order to check brake serviceability. Low gear is then to be selected prior to entering the demarcated area
- The vehicle is then moved forward and again brought to a dead stop, not closer than three (3) metres from the aircraft. The guide-man shall now monitor the gap closure between the vehicle and the aircraft and direct the driver of the vehicle as it approaches its parking position at the aircraft
- All vehicles/equipment parked around the aircraft for rendering of services, shall allow sufficient space for other vehicles/equipment to approach the aircraft and perform their task safely

4.5.2 Parking on the apron

- No vehicle/equipment is allowed to be left unattended with its engine running.
- Vehicles/equipment shall only park in designated parking areas.
- Vehicles/equipment shall not be left unmanned on the taxiway, empty aircraft parking bays or between aircraft parking bays, unless on allocated demarcated parking areas and during the period of servicing aircraft.
- When parking near an aircraft ensure that the vehicle/equipment does not constitute a danger to the aircraft or other vehicles/equipment.

4.5.3 Forklifts

- Never pick up loads heavier than the SWL prescribed.
- When travelling without a load, the forks shall be raised 100 - 200mm above the ground.
- The forks shall always be locked in position.
- Beware of the mast height when near aircraft wings or fuselage.
- Cargo carried shall always be placed against the backrest of the carriage.
- When forward views are obstructed, drive in reverse. Should the view forward be obstructed and it is necessary to proceed forward then make use of a guide-man.
- When negotiating ramps up or down, the load shall always face upwards.
- When negotiating blind corners, hoot to warn any oncoming traffic.

4.5.4 FMC's (Main Deck & Lower Deck Loaders)

- Driver Seat Protector Bars shall be used if fitted.
- The safety walkway over the driver's cockpit shall be used when opening cargo hold doors or when loading/unloading.
- ULD's shall not be turned on either front or rear platforms except when the rear platform is completely lowered.
- Guide rails shall be engaged as per applicable aircraft type.
- Safety rails shall be engaged on the front platform before off-loading/loading

and again lowered on completion of the task and before closing the door.

- The front of the FMC shall never touch the aircraft except if hooks are used.
- Never allow containers/pallets to bump up against the rear or side stops of the rear platform.
- When maintenance work is being carried out, the safety bars shall be fitted to prevent crushing of maintenance technicians.
- Beware during storms as the rain can make the belts and platforms on the FMC exceptionally slippery and during electrical storms, a lightning strike on the aircraft can result in the FMC operator getting a bad shock as this earth's the aircraft and FMC together.

4.5.5 Catering Vehicles

- A guide-man shall always guide the vehicle into position against and away from the aircraft.
- All trolleys and catering bins or equipment shall be safely stowed at all times.
- Stabilisers shall always be lowered before raising the cabin.
- Safety rails shall be extended when the cabin is raised.
- Care shall always be taken to ensure probes and stall warning vanes close to passenger doors are clear of the front section of the cabin.
- The rear cabin door shall remain closed during the raising and lowering of the vehicle.
- Caterers shall not throw ice onto the apron.

4.5.6 Ground Power Units

- Check cables and plugs for damage before arrival of each flight.
- Be exceptionally careful during inclement weather. A wet plug could result in a short circuit injuring the ground engineer or damaging the aircraft wiring circuits.
- Plug in and then switch the power on.
- Switch off power and then remove the plug.
- Do not drag cables across the apron.
- Stow the plug correctly.

4.5.7 Air Start Systems

- Air start systems shall be switched off when being coupled or disconnected to/from the aircraft.
- Walk across the ramp following the centre of the fuselage when going to disconnect and remove the hoses.
- Where possible keep the air start vehicle between you and a running aircraft engine.

4.5.8 Water and Toilet Servicing Vehicles

- Pipes and connections shall be correctly stowed at all times.
- A guide-man shall be used to help position the vehicle correctly.
- Beware of avionic aerials in close proximity to toilet and water access panels.
- The correct protective clothing shall be worn to protect the individual from spillages.

4.5.9 Tugs

- Each Handling Agent shall use their discretion in terms of the number of operators required during a tug pushback operation. The organisation strongly recommends that there shall be at least two (2) operators whilst carrying out this procedure. Operators are advised of pertinent risks associated with one man push backs operations. Cognisance shall be taken of the recent amendments made to IATA Recommended Practice AHM 631.
- When towing tow bars of aircraft from one bay to another, a safety pin shall be inserted into the main pin to prevent the tow bar from being dislodged whilst driving.

4.6 Requirements for operational vehicles and equipment

The following are operational requirements that shall be met prior to a permit been issued:

- Usage

  These procedures apply to ALL vehicles and equipment operating airside of operated Airports.

- Operational Vehicles and Equipment
  - Any vehicle or moveable equipment accessing or entering airside is considered an operational facility and is required to have the appropriate signage and strobe light prior to obtaining access.
  - This includes the Group and all Stakeholder management who utilise privately owned vehicles as operational vehicles
  - Permission to utilise these vehicles shall be obtained from the authorised signatory at each airport

- Strobe light
  - A medium size amber strobe light of a low intensity shall be fitted to the roof or other elevated/highest part of the vehicle or item of equipment
  - The amber strobe light shall be visible from all angles
  - The amber strobe light shall be serviceable and operated at the time of entering the access security point onto airside
  - A portable strobe light may be used

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In the event that a Safety/ARFFS Officer identifies that the strobe light is not serviceable, the driver/operator shall be requested to remove the vehicle/equipment immediately and have it repaired within one (1) hour of notification. This violation shall not be taken into consideration for the confiscation of a Security Permit.

- Exceptions to the amber coloured strobe light
  - SAPS: Blue strobe lights
  - Emergency Services: Red strobe lights
  - ARFFS: Red strobe lights
- Signage
- As per guidelines in the Aviation Safety Serviceability Inspection Procedure B160 001M

- Aerodrome Rescue Fire Fighting Vehicles
  These vehicles shall be exempted from the standard, but shall be required to conform to the standard as documented in the RFF procurement Tender document, which requires white decals

- Exemptions
  The following ground support equipment is exempted from having to display the signage on the roof:
  - High Loader
  - Conveyor
  - Cargo Tractor
  - Transporter/Cargomatic

- Battery Cars/Golf Carts
  The prefix is not required on the roof if the battery car/golf cart has a soft canopy as a roof. The company logo is optional on the sides but the prefix is required.

- General
  The following guidelines are recommended for the placement of a strobe light:
  - Forklifts: mounted on overhead steel structure
  - High Loader: mounted on overhead steel structure close to the driver's seating
  - Catering vehicles: mounted on roof
  - Ground Power Unit: mounted on the structure itself
  - Air Start Systems (trucks): mounted on roof
  - Conveyors: mounted on structure/roof of drive's cabin
  - Tugs: mounted on the roof structure
  - Passenger aid unit: mounted on roof
  - Mobile steps: mounted on driver's area
  - Cherry picker: mounted on the roof of truck
  - Buses: mounted on roof
  - Battery car: mounted on an erected steel frame
  - Vehicles/Light Delivery Vehicles/Microbus: mounted on roof

4.6.1 Licensing and roadworthiness certificates.

4.6.1.1 The following motor vehicles are required to have road worthy and licence certificates

- Water Trucks (WSU)
- Toilet Trucks
- Passenger Aid Units (HLU built on truck chassis)
- Catering Trucks (CLU)
- Buses (APB that have been adapted for airport use)
- Fuel Hydrant Unit (AFH)
- Fuel Truck (AFT)
- Car (CAR)
- Van (VAN)
- Trailers (SPE)
- Maintenance High Lift Truck (MLU)
- All Modified Commercial Vehicles
- ARFFV's

4.6.1.2 The following vehicles/ground support equipment is exempted from the NRTA and Regulations (Please specify which NRTA regulations i.e.: licensing, roadworthy, etc.)

- Towbarless Tugs (ATL)
- Conventional Tug (ATC)
- Main Deck Loader (MDL)
- Lower Deck Loaders (LDL)
- Steps for Narrow & Wide Body Aircraft (PBS)
- Pallet and Container Transporters (PTC)
- Conveyor Belt Loader (CBL)
- Cargo Tractors (CTU)
- Baggage Tractors (BTU)
- Baggage ULD Dollies (BCT)
- Cargo ULD Dollies (PDT)
- Postal/Cargo Cart/Baggage Cart (CCT)
- Cherry Pickers (PUT)
- Passenger Aid Unit (HLU built for purpose)
- Dedicated Airport Buses (ABP)
- Grand Power Units (GPU)
- Air Start Units (ASU)
- Forklifts (FLU)
- Tow Bar (TBR)
- Tail Stands (TSU)
- Golf Carts (SPE)

4.7 Inspection of dolly's, trolleys, trailers and baggage wagons

4.7.1 Identification markings

- All dolly's, trolleys, trailers and baggage wagons shall be marked by the Airside Service Provider so that it is clearly identified
- A register shall be kept by the Airside Service Provider that shall be inspected at any time for any reason by a designated person
- The register shall indicate the identification that has been allocated to each piece of equipment

4.7.2 Low intensity amber strobe light

- Low intensity amber strobe light requires power source and is replaced by reflectors or yellow reflective marking strips on dolleys, trolleys and trailers.

4.7.3 Marking Strips

- It is required in terms of Regulation 192A of the Road Traffic and Road Transportation Legislation that rear and side marking strips are required on all trailers, irrespective of weight or age
- The strip shall be required to identify at least 80% of the length and width of the trailer
- The strips shall comply with SANS 2014, indelibly marked with an E above which shall be a letter C denoting contour marking
- The round reflectors shall be in accordance with Regulation 192 of the National Road Traffic Act which refers specially to the colour and area to be fitted
- The regulation states that reflectors shall be fitted to reflect:
  - White colour reflectors to the front
  - Red colour reflectors to the rear
  - Yellow colour reflectors to the side

4.8 Other Transport

The following means of transport are not permitted on airside:

- Bicycles
- Motor Cycles
- Quad Bikes (only Bird and Wildlife/ARFFS Officers are exempted)

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Airside Related

5. Accountabilities and Responsibilities

Issue	Person Accountable	Alternate
Has overall responsibility for adherence to procedure	General Manager or Airport Manager	Relevant designated staff member shall assume responsibility
Issue	**Person Responsible**	**Alternate**
Implementation of procedure	Safety/ARFFS Manager/HOD: ARFFS/Controller Airside	Relevant designated staff member shall assume responsibility

6. Verification

This procedure shall be verified in accordance with Verification Policy Document - Z001 002M.

7. Non Conformance

Any deviation from this procedure shall be identified and registered with corrective and preventative measures for continual improvement in accordance with Non Conformance Policy Document - Z001 001M.

8. Related Policy Documents

Non Conformance Policy Document - Z001 001M
Verification Policy Document - Z001 002M
Change Control Policy, Document - Z001 003M
Document Control Procedure - Z001 006M
Record Keeping Requirements Procedure - Z001 008M
Airfield Standard Operating Procedures Manual (Latest version)
Aviation Safety Department Airside Personal Protective Equipment Procedure - B080 001M
Operations Department Airside Vehicle Operator Permit Procedure - B150 001M
Aviation Safety Department Safety Enforcement System Procedure - B110 001M

9. Related Legislation and Standards

Aviation Legislation in South Africa, Act 72 of 1963
National Road Traffic Act 93 of 1996
IATA Airport Handling Manual, Edition 25 - AHM 903 (Latest version)
ICAO Doc 9137-AN/898 Part 8 (in total)

10. Change Control

This procedure shall only be changed with the authorisation of the Group Executive: Airport Operations and in accordance with Change Control Policy, Procedure and Working Instruction - Z001 003M.

11. Records

Record Name	Storage Location	Record Number	Responsible Person	Retention Time
AVOP Compliance Record	Safety and Permit Office	SAF 037	Safety/ARFFS Manager/HOD: Permit Office	Five (5) years
Airside Vehicle Application Form	Permit Office	AVSEC 04	HOD: Permit Office	Five (5) years
Airside Related Procedure	Master in Corporate Policy Document Store	D030 000M	Senior Administrator: Policies and Procedures	Five (5) years

12. Endorsement (See Master in Corporate Policy Document Store)

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PART C5.3 : ENVIRONMENTAL TERMS AND CONDITIONS TO COMMENCE WORK - EMS 048

The following Environmental Terms and Conditions shall be strictly adhered to by all contractors when conducting works for ACSA. ACSA shall audit contractor activities, products and services on an ad hoc basis to ensure compliance to these environmental conditions. Any pollution clean-up costs shall be borne by the contractor.

ISSUE	**REQUIREMENT**
Environmental Policy	ACSA's Environmental Policy shall be communicated, comprehended and implemented by all ACSA appointed contractor staff (see attached Environmental Policy).
Storm water, Soil and Groundwater Pollution	• No solid or liquid material may be permitted to contaminate or potentially contaminate storm water, soil or groundwater resources. • Any pollution that risks contamination of these resources must be cleaned-up immediately. Spills must be reported to ACSA immediately. Contractors shall supply their own suitable clean-up materials where required. • Washing, maintenance and refuelling of equipment shall only be allowed in designated service areas on ACSA property. It is the contractor's responsibility to determine the location of these areas. • No leaking equipment or vehicles shall be permitted on the airport.
Air Pollution	• Dust: Dust resulting from work activities that could cause a nuisance to employees or the public shall be kept to a minimum. • Odours and emissions: All practical measures shall be taken to reduce unpleasant odours and emissions generated from work related activities. • Fires: No open fires shall be permitted on site.
Noise Pollution	• All reasonable measures shall be taken to minimise noise generated on site as a result of work operations. • The Contractor shall comply with the applicable regulations with regard to noise.
Waste Management	• Waste shall be separated as general or hazardous waste. • General and hazardous waste shall be disposed of appropriately at a permitted landfill site should recycling or re-use of waste not be feasible. • Under no circumstances shall solid or liquid waste be dumped, buried or burnt. • Contractors shall maintain a tidy, litter free environment at all times in their work area. • Contractors must keep on file: 1. The name of the contracting waste company 2. Waste disposal site used 3. Monthly reports on quantities – separated into general, hazardous and recycled 4. Maintained file of all Waste Manifest Documents and Certificates of Safe Disposal 5. Copy of waste permit for disposal site This information must be available during audits and inspections.
Handling & Storage of Hazardous Chemical Substances (HCS)	• All HCS shall be clearly labelled, stored and handled in accordance to Materials Safety Data Sheets. • Materials Safety Data Sheets shall be stored with all HCS.

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	• All spillages of HCS must be cleaned-up immediately and disposed of as hazardous waste. (HCS spillages must be reported to ACSA immediately). • All contractors shall be adequately informed with regards to the handling and storage of hazardous substances. • Contractors shall comply with all relevant national, regional and local legislation with regard to the transport, storage, use and disposal of hazardous substances.
Water and Energy Consumption	ACSA promotes the conservation of water and energy resources. The contractor shall identify and manage those work activities that may result in water and energy wastage.
Training & Awareness	The conditions outlined in this permit shall be communicated to all contractors and their employees prior to commencing works at the airport.

Penalties

Penalties shall be imposed by ACSA on Contractors who are found to be infringing these requirements and/or legislation. The Contractor shall be advised in writing of the nature of the infringement and the amount of the penalty. The Contractor shall take the necessary steps (e.g. training/remediation) to prevent a recurrence of the infringement and shall advise ACSA accordingly.
The Contractor is also advised that the imposition of penalties does not replace any legal proceedings, the Council, authorities, land owners and/or members of the public may institute against the Contractor.
Penalties shall be between R200 and R20 000, depending upon the severity of the infringement. The decision on how much to impose will be made by ACSA's Airport Environmental Management Representative in consultation with the Airport Manager or his/her designate, and will be final. In addition to the penalty, the Contractor shall be required to make good any damage caused as a result of the infringement at his/her own expense.

I, _____ (name & surname)
of _____
(company)
agree to the above conditions and acknowledge ACSA's right to impose penalties should I or any of my employees or sub-contractors fail to comply with these conditions.

Signed: _____ on this date: _____
(dd/mm/yyyy)

at: _____ (airport name).

AIRPORTS COMPANY SOUTH AFRICA
ENVIRONMENTAL MANAGEMENT SYSTEM
POLICY STATEMENT

Airports Company South Africa, as a world-class airport operator acknowledges that airport activities and operations may have diverse impacts on the environment and therefore accepts our stewardship role of responsible care for the environment. Consequently, we are committed to implementing and maintaining an Environmental Management System (EMS).
To achieve this, Airports Company South Africa is committed to:

- Implementing and maintaining an EMS in accordance with the principles outlined in the ISO 14001 standard.
- Complying with relevant environmental legislation, associated regulations and other applicable requirements.
- Providing a framework for setting and reviewing Objectives and Targets.

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- Providing measures to prevent environmental pollution resulting from airport activities and operations.
- Monitoring and measuring significant environmental aspects and impacts of airport activities and operations.
- Ensuring that all Airports Company South Africa employees, operators, and contractors that fall within the scope of the EMS are aware of the environmental aspects and impacts associated with their activities and operations and of the requirements of the EMS.
- Conducting regular audits of our Environmental Management System to ensure its adequacy and effectiveness.
- Ensuring continual improvement of our environmental performance.

The scope of the Environmental Management System extends to all Airports Company South Africa buildings, infrastructure and geographical areas within which Airports Company South Africa operates its aeronautical business. Airports Company South Africa managers and staff acknowledge that the implementation of this Environmental Policy is their responsibility and are committed to it. This policy shall be reviewed by management on an annual basis and made available to any interested parties on request.

Signed:  **Date: 25 October 2010**

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ANNEXURE E

Insurance Schedule

AIRPORTS COMPANY
SOUTH AFRICA

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

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SECTION B: INSURANCE CLAUSES

1. **Insurance requirements for PROJECTS with a value below R50 million on the LANDSIDE**

- Projects with a value below R50 million are automatically covered under an ACSA umbrella insurance.
- But please note that details of all projects with a value below R50 million, and with a duration that exceeds 36 months should be forwarded to ACSA Treasury as soon as the contractor is awarded (Email: nokulunga.masiza@airports.co.za) as these projects are not automatically covered under an ACSA umbrella insurance.

1.1 Contract Works.

- The contractor must secure a contract works insurance cover of a minimum of R250 000, each and every claim
- The contractor must submit to ACSA proof of cover in the form of a certificate of insurance before a contract is signed between ACSA and the contractor

1.2 Public Liability

- The contractor must secure Public Liability insurance cover for 3rd party property damage, for a minimum limit of R275 000 for each and every claim;
- The contractor must secure Public Liability insurance cover for removal of lateral support, for a minimum limit of R500 000 for each and every claim;
- The contractor must submit to ACSA proof of cover in the form of a certificate of insurance before a contract is signed between ACSA and the contractor

1.3 Professional Indemnity

- All consultants must secure Professional Indemnity cover of R5 million;
- Contractors who have a material design element, excluding typical P & G related work, as part of their scope, must secure Professional Indemnity cover of R5 million;
- The consultant must submit to ACSA proof of cover in the form of a certificate of insurance before a contract is signed between ACSA and consultant.

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2. Insurance requirements for PROJECTS with a value below R50 million on the AIRSIDE

- Projects with a value below R50 million are automatically covered under an ACSA umbrella insurance.
- But please note that details of all projects with a value below R50million, and with duration that exceeds 36 months should be forwarded to ACSA Treasury as soon as the contractor is awarded (Email: nokulunga.masiza@airports.co.za) as these projects are not automatically covered under an ACSA umbrella insurance

2.1 Contract Works

- The contractor must secure a contract works insurance cover of a minimum of R250 000, each and every claim
- The contractor must submit to ACSA proof of cover in the form of a certificate of insurance before a contract is signed between ACSA and the contractor

2.2 Public Liability

- The contractor must secure Public Liability insurance cover for 3rd party property damage, for a minimum limit of R525 000 for each and every claim;
- The contractor must secure Public Liability insurance cover for removal of lateral support, for a minimum limit of R750 000 for each and every claim;
- The contractor must secure Public Liability insurance cover for damage to aircraft, for a minimum limit of R750 000 for each and every claim;
- The contractor must submit to ACSA proof of cover in the form of a certificate of insurance before a contract is signed between ACSA and the contractor

2.3 Professional Indemnity

- All consultants must secure Professional Indemnity cover of R5 million;
- Contractors who have a material design element, excluding typical P & G related work, as part of their scope, must secure Professional Indemnity cover of R5 million;
- The consultant must submit to ACSA proof of cover in the form of a certificate of insurance before a contract is signed between ACSA and consultant.

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3. Insurance requirements for PROJECTS with a value above R50 million but below R1 billion on the LANDSIDE

- Projects with a value of more R50 million are not automatically covered under the construction policies. A separate quote is provided by insurers per project. Details of all projects with a value above R50 million should be forwarded to ACSA Treasury as soon as the contractor is awarded (Email: nokulunga.masiza@airports.co.za).

3.1 Contract Works

- The contractor must secure a contract works insurance cover as follows:
  i) a minimum limit of R300 000 each and every claim - all civil works and earthworks
  ii) a minimum limit of R300 000 each and every claim - all other claims
  iii) a minimum limit of R700 000 each and every claim – other property insured

- The contractor must submit to ACSA proof of cover in the form of a certificate of insurance before a contract is signed between ACSA and the contractor

3.2 Public Liability

- The contractor must secure Public Liability insurance cover for 3rd party property damage, for a minimum limit of R275 000 for each and every claim;
- The contractor must secure Public Liability insurance cover for removal of lateral support, for a minimum limit of R500 000 for each and every claim;
- The contractor must submit to ACSA proof of cover in the form of a certificate of insurance before a contract is signed between ACSA and the contractor

3.3 Professional Indemnity

- All consultants must secure Professional Indemnity cover of R10 million;
- Contractors who have a material design element, excluding typical P & G related work, as part of their scope, must secure Professional Indemnity cover of R10 million;
- The consultant must submit to ACSA proof of cover in the form of a certificate of insurance before a contract is signed between ACSA and consultant.

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4. Insurance requirements for PROJECTS with a value above R50 million but below R1 billion on the AIRSIDE

- Projects with a value of more R50 million are not automatically covered under the construction policies. A separate quote is provided by insurers per project. Details of all projects with a value above R50 million should be forwarded to ACSA Treasury as soon as the contractor is awarded (Email: nokulunga.masiza@airports.co.za).

4.1 Contract Works

- The contractor must secure a contract works insurance cover as follows:
  - i) a minimum limit of R300 000 each and every claim - all civil works and earthworks excluding runways
  - ii) a minimum limit of R300 000 each and every claim - runway rehabilitation
  - iii) a minimum of R700 000 each and every claim – new runway construction
  - iv) a minimum limit of R300 000 each and every claim - all other claims
  - v) a minimum limit of R700 000 each and every claim – other property insured

- The contractor must submit to ACSA proof of cover in the form of a certificate of insurance before a contract is signed between ACSA and the contractor

4.2 Public Liability

- The contractor must secure Public Liability insurance cover for 3rd party property damage, for a minimum limit of R1 025 000 for each and every claim;
- The contractor must secure Public Liability insurance cover for removal of lateral support, for a minimum limit of R1 250 000 for each and every claim;
- The contractor must secure Public Liability insurance cover for damage to aircraft, for a minimum limit of R1 250 000 for each and every claim
- The contractor must submit to ACSA proof of cover in the form of a certificate of insurance before a contract is signed between ACSA and the contractor

4.3 Professional Indemnity

- All consultants must secure Professional Indemnity cover of R10 million;
- Contractors who have a material design element, excluding typical P & G related work, as part of their scope, must secure Professional Indemnity cover of R10 million;



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- The consultant must submit to ACSA proof of cover in the form of a certificate of insurance before a contract is signed between ACSA and consultant.

5. Insurance requirements for PROJECTS with a value above R1 billion, on either LANDSIDE or AIRSIDE

- The deductibles stipulated above on paragraphs 1; 2; 3; and 4 do not apply to projects with a value above R1 billion
- Applicable deductibles will be determined on a project by project basis when insurers are approached for cover
- Details of projects above R1 billion should be forwarded to ACSA Treasury (Nokulunga.masiza@airports.co.za), **before the publication of the tender document.**