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AIRPORTS COMPANY OF SOUTH AFRICA

CONTRACT NO: ELA/7760/2025/RFP

RETURNABLE

NOTE:

- The Form of Offer and Acceptance (C1.1) is on **pages 3-6** of this document.



THE CLIENT:

Airports Company South Africa SOC Ltd
King Phalo Airport
East London
South Africa
5200

Tel: +27 (0)43 706 0306
Fax: +27 (0)43 706 0313

August 2025

CONSTRUCTION CONTRACT

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AIRPORTS COMPANY SOUTH AFRICA SOC LIMITED

PROJECT NUMBER: 4313

**TITLE OF PROJECT: APPOINTMENT OF A CONTRACTOR FOR THE
DESIGN AND CONSTRUCTION OF PAVED ACCESS ROADS TO
RUNWAYS, TURN PAD FOR RUNWAY 24, CONCRETE APRON
REFURBISHMENT AND EXTENSION OF TAXILANE FOR A PERIOD
OF 26 MONTHS AT KING PHALO AIRPORT.**

NEC 3: ENGINEERING AND CONSTRUCTION CONTRACT (ECC)

Between AIRPORTS COMPANY SOUTH AFRICA SOC LIMITED

Applicable at King Shaka International Airport

(Registration Number: 1993/004149/30)

and

(Registration Number: _____)

for

**DESIGN AND CONSTRUCTION OF PAVED ACCESS ROADS TO
RUNWAYS, TURN PAD FOR RUNWAY 24, CONCRETE APRON
REFURBISHMENT AND EXTENSION OF TAXILANE FOR A
PERIOD OF 26 MONTHS AT KING PHALO AIRPORT.**

Contents:	No of pages
Part C1 Agreements & Contract Data	[26]
Part C2 Pricing Data	[21]
Part C3 Scope of Works	[28]
Part C4 Site Information	[04]

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Part C1: Agreements and Contract Data

C1.1: Form of Offer and Acceptance

Offer

The Employer, identified in the Acceptance signature block, has solicited offers to enter into a contract for the procurement of the DESIGN AND CONSTRUCTION OF PAVED ACCESS ROADS TO RUNWAYS, TURN PAD FOR RUNWAY 24, CONCRETE APRON REFURBISHMENT AND EXTENSION OF TAXILANE FOR A PERIOD OF 26 MONTHS AT KING PHALO AIRPORT.

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 INCLUSIVE OF VAT IS:

(in words). _____

(in figures) _____

THE OFFERED PRICES ARE AS STATED IN THE PRICING SCHEDULE

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: _____

Name & signature of witness _____
(Insert name and address of organisation)
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.

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

Signature(s)

Name(s)

Capacity

the
Employer

(Insert name and address of
organisation)

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Name
& signature
of witness

Date

Schedule of Deviations

1 Subject

Details

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2 Subject

Details

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3 Subject

Details

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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.

	<u>For the Employer</u>	<u>For the Bidder</u>
Signature (s)	_____	_____
Name (s)	_____	_____
Capacity	_____	_____
Name and Address	Airports Company South Africa SOC Limited	
Name & Signature of witness	_____	_____
	<i>(Insert name and address of organisation)</i>	<i>(Insert name and address of organisation)</i>
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 <i>conditions of contract</i> are the core clauses and the clauses for Main Option	
	Main Option	B: Priced contract with bill of quantities
	Dispute resolution Option	W1: Dispute resolution procedure
	Secondary Options (incorporating amendments)	X2: Changes in the law X7: Delay damages X13: Performance Bond X16: Retention X15: Limitation of contractor's Liability for his design to reasonable skill and care X18: Limitation of liability Z: Additional conditions of contract of the NEC3 Engineering and Construction Contract, April 2013
10.1	The <i>Employer</i> is (Name)	Airports Company South Africa SOC Limited,
	Address	Airports Company South Africa SOC Limited King Phalo Airport East London South Africa 5200
	Telephone	+27 (0)43 706 0306
	Fax	+27 (0)43 706 0313
10.1	The <i>Project Manager</i> is	TBC on appointment of Joint Monitoring Consulting Team

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Contact Person:
Address:

Telephone
E-mail address

10.1	The <i>Supervisor</i> is	
	Address	
	Telephone Fax Email	
11.2	The <i>works</i> are	DESIGN AND CONSTRUCTION OF PAVED ACCESS ROADS TO RUNWAYS, TURN PAD FOR RUNWAY 24, CONCRETE APRON REFURBISHMENT AND EXTENSION OF TAXILANE AT KING PHALO AIRPORT
11.2	The following matters will be included in the Risk Register	<ul style="list-style-type: none">• Availability of As Built information• Access to Site• Site Constraints and Constructability• Municipal Approval• SACAA approval
11.2	The <i>Works Information</i> is in	Part C3 'Scope of Works' section of this contract
11.2	The <i>Site Information</i> is in	Part C4 'Works Information' section of this contract
11.2	The <i>boundary of the site</i> is	As indicated on site layout
12.2	The <i>law of the contract</i> is the law of	the Republic of South Africa
13.1	The <i>language of this contract</i> is	English
13.3	The <i>period of reply</i> is	Seven (7) days

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3	Time	
31.2	The <i>starting date</i> is	Upon signing of contract by ACSA
11.2	The <i>completion date</i> is	26 months from contractor appointment date (contract signing date)
30.1	The <i>access date</i> is	On approval of construction safety file
31.1	The <i>Contractor</i> submits a first (preliminary) programme with the tender by the tender closing date	
32.2	The <i>Contractor</i> submits revised programmes at intervals no longer than	Four (4) weeks
35.1	The <i>Employer</i> is not willing to take over the works before the <i>completion date</i>	The <i>Employer</i> and Others will have access to the <i>works</i> during construction or prior to completion. Such access by the Employer and Others shall not relieve the <i>Contractor</i> from liability for the completion of the <i>works</i> in accordance with the Works Information and in terms of this contract.
4	Testing and Defects	
42.2	The <i>defects date</i> is	Twelve (12) months after Completion of the whole of the <i>works</i>
43.2	The <i>defects correction period</i> is	Two (2) weeks
5	Payment	
50.1	The <i>assessment interval</i> is	Four (4) weeks, on the 25th day of each successive month
50.1	The <i>currency of this contract</i> is the	South African Rand
51.2	The period within which payment is made is	Four (4) weeks
51.4	The <i>interest rate</i> is	The prime lending rate of the Nedbank Bank. as determined from time to time
6	Compensation events	
60.1	The <i>weather measurements</i> 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

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60.1	Assumed values for the ten-year return <i>weather data</i> for each <i>weather measurement</i> for each calendar month are	Month	Days	Month	Days
		January	3.1	July	1
		February	2.6	August	1.4
		March	2.5	September	2.2
		April	1.8	October	3
		May	1.4	November	3.2
		June	1	December	3
* Rain days with rainfall exceeding 5mm					
7	Title	No data required for this section of the <i>conditions of contract</i>			
8	Risks and Insurance				
84.1	The <i>Employer</i> provides these insurances	Refer to the Insurance Clauses which is attached at the end of the Contract Data			
84.2	The <i>Contractor</i> 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.			
	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 <i>conditions of contract</i>			
10	Data for Main Options				
A	Priced contract with activity schedule	Tenderer to provide activity schedule with pricing information, based on works description			
11	Data for Option W1				
W1.1	The <i>Adjudicator</i> is	The person appointed jointly by the parties from the list of adjudicators contained below			
W1.2	The <i>Adjudicator nominating body</i> is	The current Chairman of the Gauteng Advocate's Bar Council			
W1.4	The <i>tribunal</i> is	Arbitration			
W1.4	If the <i>tribunal</i> is arbitration, the arbitration procedure is	The <i>arbitration procedure</i> is set out in The Rules for the Conduct of Arbitrations 2013 Edition, 7th Edition, published by The Association of Arbitrators, (Southern Africa)			

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W1.4	The place where arbitration is to be held is	Durban, KwaZulu-Natal 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	5% of the contract value. Pro-forma draft of a performance bond to be used is attached to this contract.
X16	Retention	
X16.1	The <i>retention percentage</i> is	5% of the Contract value.
X18	Limitation of Liability	
X18.1	The <i>Contractor's</i> liability to the <i>Employer</i> for indirect or consequential loss is limited to	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 one event, the <i>Contractor's</i> liability to the <i>Employer</i> for loss of or damage to the <i>Employer's</i> property is limited to	The Total damages suffered and/or costs incurred to the employer's property
X18.3	The <i>Contractor's</i> total liability to the Employer for defects due to his design which are not listed on the Defects Certificate is limited to	The Total damages suffered and/or costs incurred to the employer's property

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- X18.4 The *Contractor's* total liability to the *Employer* for all matters arising under or in connection with this contract, other than excluded matters, is limited to
- 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 damages suffered and/or costs incurred 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 Z1 – Z20 contract are

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

Z3 Other responsibilities:

Add the following at the end of core clause 27:

Z3.1 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:



Add the following as a new core clause 46:	
Z4.1	If the <i>Employer</i> cannot use the <i>works</i> due to a Defect, which arises after Completion and before the <i>defects date</i> , the <i>defects date</i> is delayed by a period equal to that during which the <i>Employer</i> , due to a Defect, is unable to use the <i>works</i>
Z4.2	If part of the <i>works</i> is replaced due to a Defect arising after Completion and before the <i>defects date</i> , the <i>defects date</i> for the part of the <i>works</i> 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 <i>Project Manager</i> notifies the <i>Contractor</i> of the change to a <i>defect date</i> when the delay occurs. The period between Completion and an extended <i>defects date</i> does not exceed twice the period between Completion and the <i>defects date</i> 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 rescue 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 <i>Contractor</i> gives the <i>Employer</i> an unconditional, on-demand performance bond, provided by a bank which the <i>Project Manager</i> and the <i>Employer</i> 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 <i>Contractor ensures</i> that the performance bond is valid and enforceable until the end of the <i>contract period</i> . If the terms of the performance bond specify its expiry date and the end of the <i>contract period</i> does not coincide with such expiry date, four weeks prior to the said expiry date, the <i>Contractor</i> extends the validity of the performance bond until the end of the <i>contract period</i> . If the <i>Contractor</i> fails to so extend the validity of the performance bond, the <i>Employer</i> may claim the full amount of the performance bond and retain the proceeds as cash security
Z7	Limitation of liability:
Insert the following new clause as Option X18.6:	
Z7.1	The <i>Employer's</i> liability to the <i>Contractor</i> for the <i>Contractor's</i> 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 <i>Contractor</i> 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 <i>Contractor</i> shall not cede, delegate or assign any of its rights or obligations to any person without the written consent of the <i>Employer</i> , 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 <i>Contractor</i>
Z8.2	The <i>Employer</i> 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 <i>Contractor</i> 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 <i>Employer</i> for the performance of the Contract.
Z9.2	The <i>Contractor</i> shall, within 1 week of the Contract Date, notify the <i>Project Manager</i> and the <i>Employer</i> of the key person who has the authority to bind the <i>Contractor</i> on their behalf.
Z9.3	The <i>Contractor</i> 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 <i>Employer</i> .
Z10	Ethics
Z10.1	The <i>Contractor</i> 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 <i>Employer</i> is subject, including but not limited to the Prevention and Combating of Corrupt Activities Act, 12 of 2004.
Z10.3	The <i>Contractor's</i> breach of this clause constitutes grounds for terminating the <i>Contractor's</i> obligation to Provide the Works or taking any other action as appropriate against the <i>Contractor</i> (including civil or criminal action). However, lawful inducements and rewards shall not constitute grounds for termination.
Z10.4	If the <i>Contractor</i> 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 <i>Employer</i> , the <i>Employer</i> 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 <i>Contractor</i> 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 <i>Project Manager</i> or the <i>Employer</i> , which consent shall not be unreasonably withheld.

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- 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

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Z14	Intellectual Property
Z14.1	Intellectual Property ("IP") rights mean all rights in and to any patent, design, copyright, trademark, 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 <i>Contractor</i> gives the <i>Employer</i> 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 <i>Contractor</i> is to be obtained before the <i>Contractor's</i> IP made available to any third party which approval will not be unreasonably withheld or delayed. Prior to making any <i>Contractor's</i> IP available to any third party the <i>Employer</i> shall obtain a written confidentiality undertaking from any such third party on terms no less onerous than the terms the <i>Employer</i> would use to protect its IP
Z14.5	The <i>Contractor</i> shall indemnify and hold the <i>Employer</i> 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 <i>Contractor's</i> design, manufacture, construction or execution of the Works
Z14.5.2	the use of the <i>Contractor's</i> Equipment, or
Z14.5.3	the proper use of the Works.
Z14.6	The <i>Employer</i> shall, at the request and cost of the <i>Contractor</i> , assist in contesting the claim and the <i>Contractor</i> may (at its cost) conduct negotiations for the settlement of the claim, and any litigation or arbitration which may arise from it.
Z15	Dispute resolution:



Z15.1 Appointment of the Adjudicator

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@mwweb.co.za
Adv. Saleem Ebrahim	Gauteng	+27 11 535-1800 salimebrahim@mwweb.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 ryneke@duma.nokwe.co.za
Mr. Emeka Ogbugo (Quantity Surveyor)	Pretoria	+27 12 349 2027 emeka@gosiame.co.za



Z15.2 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 ryneke@duma.nokwe.co.za
Mr. Emeka Ogbugo (Quantity Surveyor)	Pretoria	+27 12 349 2027 emeka@gosiame.co.za

Z16 Notification of a compensation event

- Z16.1** 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.”

Z17 BBBEE Certificate

- Z17.1** 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.

Z18 Communication

- Z18.1** **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
- Z18.2** 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.

Z19 Delegation

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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:

- Z19.1** 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 TWO – DATA PROVIDED BY THE *CONTRACTOR*

Clause	Statement	Data
10.1	The Contractor is (Name): Address: Telephone No. Fax No.	
11.2	The <i>working areas</i> are	King Phalo Airport site Area. See C4 'Site Information'
24.1	The <i>Contractor's Key people</i> are:	
	Name:	
	Job: Construction Manager	
	Responsibility:	
	Qualifications:	
	Professional Registration:	SACPCMP- Professional Construction Manager (PrCM)
	Experience (minimum 5 years post registration):	
	Name:	
	Job: Civil Engineer (Principal Consultant)	
	Responsibility:	
	Qualifications:	
	Professional Registration:	ECSA - Professional Engineer (PrEng) or Professional Technologist (PrTech)
	Experience (minimum 5 years post registration) :	

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Name:

Job: **Quantity Surveyor**

Responsibility:

Qualifications:

Professional Registration: **SACQSP – Professional Quantity Surveyor (PRQS)**

Experience (minimum 3 years post registration) :

Name:

Job: **Construction Health and Safety Agent**

Responsibility:

Qualifications:

Professional Registration: **SACPCMP- Professional Construction Safety Agent (PrCHSA)**

Experience : (minimum 3 years post registration)

Name:

Job: **Electrical Engineer**

Responsibility:

Qualifications:

Professional Registration: **ECSA - Professional Engineer (PrEng) or Professional Technologist (PrTech)**

Experience (minimum 5 years post registration):

11.2	The <i>completion date</i> is	26 months from contractor appointment date (Contract Signing date)
11.2	The following matters will be included in the Risk Register	<ul style="list-style-type: none">• Existing Services• Access to Site• Delay in supply of material and/or equipment• Program management• Cash flow management
11.2	The <i>Works Information</i> is in	Part C3 'Scope of Works' section of this contract
31.1	The programme identified in the	Programme listed in Schedule C8 of Part T2.1

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Part C1: Agreements and Contract Data

C1.3: Form of Guarantee

PRO FORMA FOR PERFORMANCE BOND

PERFORMANCE BOND

[TO BE REPLICATED ON BANK'S LETTERHEAD]

Brief description of contract.....

Name and address of Beneficiary.....

..... (whom the contract defines as the Contractor).

We, the undersigned and..... in our capacities as Guarantor's..... of (**Registration Number:**) (hereinafter called "the Bank") have been informed that hereinafter called the 'Principal') is your Contractor under such contract, which requires him to obtain an irrevocable, unconditional performance security.

At the request of the Principal, we (name of bank) hereby irrevocably undertake to pay you, the Employer, any sum or sums not exceeding in total the amount of (the "Guaranteed Amount") upon receipt by us of your first written demand stating that such an amount (or lesser amount) as may be claimed is due and payable to the Employer.

This guarantee constitute an irrevocable, unconditional, non-negotiable and non-transferable undertaking to pay in accordance with the above, subject to the proviso that this Letter will not be interpreted as extending the Bank's liability to anything more than the Guaranteed Amount.

Notwithstanding anything to the contrary herein contained, the Bank's obligation shall be construed as principal and not as accessory to the contract and shall not be delayed or discharged by the fact that a dispute exists between the Employer and the Contractor.

We undertake to pay you such Guaranteed Amount upon receipt by us, within such period of 14 days, of your first written demand stating that such an amount (or lesser amount) as may be claimed is due and payable to the Employer.

The guarantee shall be governed by and construed in accordance with the laws of the Republic of South Africa

Signed at _____ on _____ 20....

For:

Registration Number:

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Name & Position

As witnesses:

1. _____

2. _____

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PART C1: AGREEMENTS AND CONTRACT DATA

C1.4: OCCUPATIONAL HEALTH AND SAFETY AGREEMENT

OCCUPATIONAL HEALTH AND SAFETY AGREEMENT

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

OBJECTIVES

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

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

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

The parties to this Agreement are:

Name of Organisation: AIRPORTS COMPANY SOUTH AFRICA King Phalo Airport
Physical Address: Airport Company South Africa King Phalo Airport East London South Africa

Hereinafter referred to as "Client"

Name of organisation:
Physical Address

Hereinafter referred to as "the Mandatary/ Principal Contractor"

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MANDATORY'S MAIN SCOPE OF WORK

DESIGN AND CONSTRUCTION PAVED ACCESS ROADS TO RUNWAYS, TURN PAD FOR RUNWAY 24, CONCRETE APRON REFURBISHMENT AND EXTENSION OF TAXILANE AT KING PHALO AIRPORT

GENERAL INFORMATION FORMING PART OF THIS AGREEMENT

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

THE UNDERTAKING

The Mandatory undertakes to comply with:

INSURANCE

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

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claims arising from their and /or their Subcontractors and/or their respective employee's acts and/or omissions on the Client's premises.

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

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

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

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FURTHER UNDERTAKING

1. Only a duly authorised representative appointed in terms of Section 16.2 of the OHS Act is eligible to sign this agreement on behalf of the Mandatary. The signing power of this representative must be designated in writing by the Chief Executive Officer of the Mandatary. A copy of this letter must be made available to the Client.
2. The Mandatary confirms that he has been informed that he must report to the Client's management, in writing anything he/she deems to be unhealthy and /or unsafe. He has versed his employees in this regard.
3. The Mandatary warrants that he/she shall not endanger the health & safety of the Client's employees and other persons in any way whilst performing work on the Client's premises.
4. The Mandatary understands that no work may commence on the Client's premises until this procedure is duly completed, signed and received by the Client.
5. Non-compliance with any of the above clauses may lead to an immediate cancellation of the contract.

ACCEPTANCE BY MANDATARY

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

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

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

Expiry date

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

DATE

SIGNATURE ON BEHALF OF THE CLIENT
AIRPORT COMPANY SOUTH AFRICA

DATE

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PART C1: AGREEMENTS AND CONTRACT DATA

2 C1.4: ACSA INSURANCE CLAUSES

Commented [TT1]: Check validity

INSURANCE CLAUSES FOR CAPEX PROJECTS

Refer to Annexure B on Insurance Clauses for Airside construction contracts where the awarded contract value does not exceed R150 million, and the construction period does not exceed 36 months. And the defects liability period does not exceed 24 months.

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AIRPORTS COMPANY OF SOUTH AFRICA

CONTRACT NO: ELA/7760/2025 – CONTRACTOR APPOINTMENT FOR DESIGN AND CONSTRUCTION OF PAVED ACCESS ROADS TO RUNWAYS, TURN PAD FOR RUNWAY 24, CONCRETE APRON REFURBISHMENT AND EXTENSION OF TAXILANE FOR A PERIOD OF 26 MONTHS AT KING PHALO AIRPORT..

C2.1 Pricing Instructions

C.2.1.1 Design and Professional Team

1. The fee for services rendered will be the standard fees and stages as per the:
 - ECSA Guideline Scope of Services and Tariff of Fees for Persons Registered in terms of the Engineering Profession Act, 2000, (Act No. 46 of 2000) as amended in Government Gazette No. 44333, 26 March 2021. **Bidder to include on the Civil Engineer Normal Services, the Engineering Management fees. The Civil Engineer with head the professional team as Principal Consultant**
 - Guidelines for Professional fees in terms of Project and Construction Management Professions Act, 2000, Act 48 as amended by Government Gazette 42697 of 13 September 2019.
 - Guidelines for Professional fees in terms of Quantity Surveying Profession Professions Act, 2000, Act 49 as amended by Government Gazette 39134 of 28 August 2015.
 - Guidelines for Professional fees in terms of Professional Construction Health and safety Agent. Professions Act, 2000, Act 48 as amended by Government Gazette 42697 of 13 September 201.
 - The amounts inserted in the Activity Schedules are deemed to include all expenses, costs, profit, general obligations etc, necessary to carry out the professional services described in this Tender document.
 - Pricing Assumptions mean the criteria as set out below, read together with all parts of this Tender document, which it will be assumed in the contract that the tenderer has considered when developing his prices.
 - The short descriptions given in the Activity Schedule below are brief descriptions used to identify the activities for which prices are required. Detailed descriptions of the activities to be priced are provided in the Scope of Work.
 - While it is entirely at the tenderer's discretion with regards to pricing the Activity Schedule below, guideline tariffs of fees or indicative cost-based and time-based fee rates are gazetted annually by each of the built environment professional bodies, which are useful documents that will give tenderers some idea of industry norms against which they may compare their rates, sums, percentage fees and/or prices as applicable.
 - For the BoQ Schedule, the following words shall have the meanings hereby assigned to them:
 - Unit: The unit of measurement for each item of work.
 - Quantity: The number of units of work for each item.
 - Rate: The agreed payment per unit of measurement.



- Amount: The product of the quantity and the agreed rate for an item.
 - Sum: An agreed lump sum payment amount for an item, the extent of which is described in the Scope of Work, but the quantity of work which is not measured in any units.
- A rate, sum, percentage fee and/or price as applicable, is to be entered against each item in the BoQ. An item against which no price is entered will be considered to be covered by the other prices or rates in the Activity/Pricing Schedule.
- A price/rate shall be entered against each item in the Activity/Pricing Schedule. 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.
- The Employer reserves the right, by giving written notice to the Service Provider, to cancel the project at any time. Should the Employer exercise this right, the below shall be applicable.
 - Termination shall be administered per the Contract (NEC ECC) and the applicable ECSA 2021 Gazetted Guidelines.
 - Third Party Service Providers - If a termination is administered, Third Party Service Providers will only be paid for work done. The above applies to Surveying, Geotechnical, Testing, Site Monitoring, Environmental Services, etc.
- **The Employer reserves the right, by giving written notice to the Service Provider, to cancel a project stage at any time.**
- Telephonic, electronic and fax communication, special postage and courier deliveries are not payable for this appointment. A disbursement plan based on the tendered provisional sum for the professional services for the duration of the project will be agreed with the appointed service provider.
- Tenderers must only price in accordance with the pricing schedule.
- Tenderers are to price for all disciplines for this project under each Normal Identification of Work Services, respectively.
- During the project lifecycle, the percentage based professional fees will be adjusted in line with the estimated construction value and percentage fee tendered. The first fee adjustment will be at the end of Stage 3: Tender Documentation and Contractor Procurement. The offered percentage is fixed and will be applied to the final construction awarded value for final fee calculation purposes. The time-based fees will not be adjusted and are fixed.
- The employer reserves its right to adjust fees based on the Estimated Cost to Completion to justify the recovery of fees from the consultant if the consultant is overpaid. Approvals are to be obtained through internal and/or external governance processes. No adjustment will take effect until all applicable governance processes have been confirmed successfully concluded by the employer's agent.
- The employer reserves its rights to adjust fees if a change request which affects the project value is approved. Approvals are to be obtained through internal and/or external governance processes. No adjustment will take effect until all applicable governance processes have been confirmed successfully concluded by the employer's agent.
- Project Closure fees will only be released upon completion and handover of all project documentation at the end of the project. Documents/data will be required in CAD dwg, MS Word, PDF and Excel format. All Third-Party services data must be submitted at project close out.
- The BPA provided by the Employer will contain the contingency allocation, however, the 10% contingency is not part of the professional fee due to the Service Provider unless agreed with the Employer.
- The Contingency as contained in the pricing schedule may only be utilised when approved by the Employer. A formal justification for the release of the funds is required. The justification must be linked to a change in project scope, cost, or time.

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- The monthly rate for construction monitoring services shall be all inclusive i.e. Travelling expenses, for either the return office to site or return home to site journeys, accommodation. Only on approval from the Employer, may the bidder claim the cost for these services as listed in the Activity Schedule.
- Claimable disbursement cost is listed in item 4.1.1 (i)(ii) below.

Disbursements

- Only project related costs listed below and presented to ACSA will be compensated by ACSA;**
 - Miscellaneous cost (ACSA Permits, Construction Permits, Induction, Training Courses, etc)
 - Printing, binding, laminating.
 - Building, wayleave or services permits.
 - Third party service provider costs
 - Travelling and accommodation (**only travel from more than 50km radius from construction site**)
- No payment for disbursement will be made for the following:**
 - Typing of correspondence, payment certificates, variation orders, progress reports or financial reports
 - Software etc.
 - Telephone calls
 - Cellular calls
 - Computer costs
 - Telefaxes (outgoing or incoming)
 - Emails (sent or received)
- Disbursements will be paid at proven cost. The onus sits with the consultant to provide proof and prior Approval.**

Claimable disbursement cost below:

**TYPING AND DUPLICATING (EXCLUDING VAT)**

Table 1: Rates for typing and duplicating undertaken by the consultant himself.

From	Typing of original/master per A4	Duplicating				Printed or copied binder set	
		On white paper		On coloured paper			
		A4	A3	A4	A3	A4	A3
2009-08-15	R20,00	R0,55	R1,00	R0,65	R1,15	R14,00	R18,00
2013-01-01	R22,00	R0,65	R1,60	R0,90	R1,70	R18,00	R24,00
2017-09-01	R28,00	R0,85	R2,10	R1,20	R2,40	R26,00	R34,00
2020-04-01	R31,00	R0,95	R2,35	R1,35	R2,70	R28,80	R37,70

From	Duplicating in colour	
	A4	A3
2009-08-15	*R7,00	*R11,00
2013-01-01	*R8,00	*R13,50
2017-09-01	*R8,50	*R14,00
2020-04-01	*R9,40	*R15,50

* Payable only upon prior written approval by Departmental Project Manager.

DRAWING DUPLICATION (EXCLUDING VAT)

Table 2: Rates for drawing duplication undertaken by the consultant himself.

From	Duplicating		
	A2	A1	A0
2009-08-15	R10,00	R14,00	R22,00
2013-01-01	R15,00	R20,00	R33,00
2017-09-01	R18,00	R26,00	R40,00
2020-04-01	R19,95	R28,80	R44,30

Note: Please use **2020** rates when claiming disbursements.

Airport Permit & Training Costs**Airport Training Courses**

1. AIT (Airside Induction Training)
Initial – R 570.00 Excl. VAT
Refresher – R 416.00 Excl. VAT
2. AVOP (Airside Vehicle Operator Permit)- Required for driving on Airside.
Initial – R 596.00 Excl. VAT
Refresher – R 416.00 Excl. VAT
3. General Security Awareness Training – R741 (Excl. Vat)

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Permit Prices

ACSA PERMIT PRICES - 2021

Permit type	Duration	Current Price
PERSONAL PERMITS		
Personal permanent permits	6days-2years	270
Per Icon		70
Personal temporary permits	2-5 days	270
Personal visitors permit	1 day	270
VEHICLE PERMITS		
Vehicle permanent permits	1 year	1141
Vehicle add-on fee	1 year	5105
Vehicle temporary permits	1 - 3mths	300
Prorated add-on fee	1 - 3mths	1452
Vehicle temporary permits	3 -6mths	595
Prorated add-on fee	3 - 6mths	2900
Vehicle temporary permits	1-3 days	138
Vehicle temporary permits	4-30 days	300
Reprint of Vehicle Disc		138
Change of Registration		138
Contractors Vehicles 1- 3 Months		520
Contractors Vehicles 4 - 6 Months		1035
Permanent Contractors Vehicle Permit	1 year	1975
PARKING PERMITS		
Staff Parking	1 year	95
Taxi Parking	1year	95

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C.2.1.2 Construction Priced BoQ

1. The contractor shall, as per the NEC3, contract option B: Priced contract with Bill of Quantities provide a fully priced bill of quantities, to be handed in with this tender.
2. **The Priced Sum for the for the construction works BoQ (Schedule A: Roadworks) is an inductive price for construction at tender submission stage. The Employer will, upon conclusion and submission of stage 3 report with associated construction cost estimate, make necessary investment decision prior implementation of the works in full or part thereof based on the final stage 3 revised quantities.**
3. A bill of quantities is provided with the documentation. The bill of quantities aims provide information to the contractor in regard to measured quantities, distances, etc.
4. The responsibility for the accuracy of the quantities written into the bill of quantities remains with the party who prepared the bill of quantities. The Bidder are to ensure that the measuring of quantities at the tender stage, and the Bid Sum submitted are correct and include all items required for the construction works, as described in the works information section of this document.
5. The measurement and payment clauses of the COLTO Standard Specifications for Road and Bridge Works for State Road Authorities 1998 shall be deemed to form part of and included in the Pricing Instructions.
6. The Contract Data, the Scope of the Work and the Site Information are to be read in conjunction with the Bill of Quantities. Descriptions in the Bill of Quantities are abbreviated and comply generally with those in the Standardized Specifications. The payment Clause of each Specification, read together with the relevant clauses of the Scope of Work, set out what ancillary or associated activities are included in the rates for the operations specified. Should any requirements of the measurement and payment clause of the applicable Standardized Specification, or the Scope of Work, conflict with the terms of the Bill, the requirements of the Standardized or Scope of Work, as applicable, shall prevail.
7. The Bill of Quantities comprises items covering the Contractor's profit and costs of general liabilities and of construction of temporary and permanent Works.
8. The clauses in a specification in which further information regarding the billed item can be obtained appear under "Payment Refers" in the Bill. The reference clauses indicated are not necessarily the only sources of information in respect of billed items. Further information and set specifications may be found elsewhere in the contract documents. Standardised Specifications are identified by the item item numbers in the COLTO Standard Specification for Road and Bridge Works for State Authorities (1998 edition).
9. The Tenderer is at liberty to insert a rate of his own choosing for each item in the Bill but his attention is drawn to the fact that the Contractor has the right, under various circumstances, to payment for additional Works carried out and that the Employer's Agent is obliged to base his assessment of the rates to be paid for such additional work on the rates inserted in the Bill.



10. The measurement and payment clauses of each Specification, read together with the relevant clauses of the Specification Data, set out what ancillary or associated activities are included in the rate for the operations specified.
11. The Bill of Quantities has been drawn up generally in accordance with the latest issue of the COLTO Standard Specifications for Road and Bridge Works for State Road Authorities 1998. Descriptions in the Bill are abbreviated and must be read in conjunction with the measurement and payment clauses of the applicable Specifications.
12. Unless otherwise stated, items are measured net in accordance with the Drawings, and no allowance has been made for waste.
13. All the rates tendered and inserted in the Bill of Quantities shall be **exclusive** of VAT. Provision has been made on the Summary Page of the Bill of Quantities for the addition of VAT. Except that they shall not include Value Added Tax (VAT), the rates to be inserted in the Bill of Quantities are to be the full inclusive rate to the Employer for the work described under each item. Such rates shall cover all costs and expenses that may be required in and for the construction of the work described and shall cover the cost of all general risks, liabilities, and obligations set forth or implied in the documents on which the tender is based.
14. **Notwithstanding C2.1.1.8 above, all rates tendered and inserted in the Bill of Quantities against each item shall be deemed to be inclusive of the Contractor's labour cost for all permanent unskilled, semi-skilled, skilled and supervisory staff. All other labour costs in terms of local labour employed in terms of Sub Clauses 4.3.5 and 4.3.6 of the Conditions of Contract, shall be payable to the Contractor as listed and detailed under Section 1: Preliminary and General of the Bill of Quantities.**
15. A rate is to be entered against each item in the Bill of Quantities, whether the quantities are stated or not. An item against which no rate has been entered will be considered to have a rate of R 0, 00.
16. The Tenderer must price and extend each item, total each page and carry the total of each section in the Bill of Quantities to the Summary page.
17. Attention is drawn to Clause 6.7 of the Conditions of Contract and the Contractor must not order the quantities of materials stated in the Bill of Quantities until he has confirmed from the construction drawings or measurement on Site that such quantities are in fact the correct quantities. The quantities set out in the Bill of Quantities are the estimated quantities of the Contract Works but the Contractor will be required to undertake whatever quantities may be directed by the Employer's Agent from time to time. The final Contract Price for the completed contract shall be computed from the actual quantities of work done, valued at the relevant unit rates and prices.
18. The prices and rates to be inserted in the Bill of Quantities are to be the full inclusive prices for the work described under the several items. Such prices and rates shall cover all costs and



expenses that may be required in and for the execution of the work described, and shall cover the cost of all general risks, liabilities, and obligations set forth or implied in the documents on which the tender is based, as well as overhead charges and profit. Reasonable prices shall be inserted as these will be used as a basis for assessment of payment for additional work that may have to be carried out.

19. Except where rates only are required, the Tenderer shall insert all amounts to be included in his total tendered price in the "Amount" column and show the corresponding total tendered price.
20. Arithmetical errors of responsive tenders shall be corrected in the manner specified under the Standard Conditions of Tender. **(Refer also CIDB Practice Note No. 2 dated August 2006)**
21. The units of measurement described in the Bill of Quantities are metric units. Abbreviations used in the Bill 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
m ²	=	square metre
m ² -pass	=	square metre-pass
m ³	=	cubic metre
m ³ -km	=	cubic metre-kilometre
MN	=	meganewton
MN.m	=	meganewton-metre
MPa	=	megapascal
No.	=	number
Prov sum	=	Provisional sum
PC sum	=	Prime Cost sum
R/only	=	Rate only
L/sum	=	lump sum
t	=	ton (1000 kg)
W/day	=	work day
months	=	months
veh/month	=	vehicle month
man-day	=	each flagman per day

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CONTRACT NO: ELA/7760/2025 – CONTRACTOR APPOINTMENT FOR DESIGN AND CONSTRUCTION OF PAVED ACCESS ROADS TO RUNWAYS, TURN PAD FOR RUNWAY 24, CONCRETE APRON REFURBISHMENT AND EXTENSION OF TAXILANE FOR A PERIOD OF 26 MONTHS AT KING PHALO AIRPORT..

C2.2 BILLS OF QUANTITIES

C2.3.1 Schedule A: Road Construction Work

C2.3.2 Schedule B: Electrical Work

C2.3.3 Schedule C: Concrete Apron Rehabilitation Works

C2.3.4 Schedule D: Taxilane Extension Work

C2.3.5 Schedule E: Professional Services Team

C2.3.6 Summary of Schedules

Calculation of Tender Sum

BIDDER TO COMPLETE BILL OF QUANTITY IN EXCEL DOCUMENT PROVIDED AND ATTACH PDF COPY AS ANNEXTURE TO THIS SUBMISSION

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SCHEDULE A: ROAD CONSTRUCTION

SECTION 1200

ITEM NO	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT
	<u>GENERAL REQUIREMENTS AND PROVISIONS</u>				
B12.01	Unforeseen delays due to actions by Airport Authority				
	(a) Pavement team	hour	32		
B12.02	Control of dust and FOD pollution on the taxiways, taxilanes, service roads, aprons, haul and site access roads and campsite/site offices	-	lump	sum	
B12.03	Provision for direct costs incurred for obtaining all personal and vehicle permits and parking cards				
	(a) Actual cost of permits	-	Prov	Sum	100 000.00
	(b) Handling costs and profit in respect of subitem B12.03(a)	%	100 000		
B12.04	Traffic safety officer	month	8		
B12.06	Penalty to be deducted for non-compliance with requirements for accommodation of traffic as set out in B1230 and 1500				
	(a) Fixed penalty per occurrence	number	-	5 500.00	-
	(b) Time related penalty	hr	-	5 500.00	-
1200	Carried forward				

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**SCHEDULE A: ROAD CONSTRUCTION****SECTION 1200**

TEM NO	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT
	Brought forward				
B12.07	Compliance with Environmental Specification				
	(a) Time for Environmental Training	-	lump	sum	
	(b) General Compliance with Environmental Specifications	-	lump	sum	
	(c.) Penalty for non-compliance with Environmental Specifications per occurrence	number	-	5 500.00	-
B12.08	Occupational health and safety				
	(a) Contractors initial obligations in respect of the Occupational Health and Safety Act and Construction Regulations	-	lump	sum	
	(b) Contractors time related obligations in respect of the Occupational Health and Safety Act and Construction Regulations	month	8		
	(c) Provision of full time construction safety officer	month	8		
	(d) Submission of Health and safety file	-	lump	sum	
	(e.) Penalty for non-compliance with OHS Act and Construction Regulation Requirements per occur	number	-	5 500.00	-
B12.09	Security requirements				
	(a) Security requirements at the Contractor's Gate	-	Prov	Sum	150 000.00
	(b) Handling costs and profit in respect of subitem B12.09(a)	%	150 000		
B12.10	Relocation and protection of existing services				
	(a) Relocation, including lowering or raising protection and/or repair of existing services which are not allowed for in any other items in the schedule of quantities	-	Prov	Sum	30 000.00
	(b) Handling costs and profit in respect of subitem subitem B12.10(a)	%	30 000		
B12.11	Additional testing (FWD) for structural integrity of the concrete pavement				
	(a) Additional testing (FWD) for structural integrity of the concrete pavement	-	Prov	Sum	140 000.00
	(b) Handling costs and profit in respect of subitem subitem B12.11(a)	%	140 000		
1200	TOTAL CARRIED TO SUMMARY				

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SCHEDULE A: ROAD CONSTRUCTION

SECTION 1300

ITEM NO	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT
B13.01	<u>CONTRACTOR'S ESTABLISHMENT ON SITE AND GENERAL OBLIGATIONS</u>				
	The Contractor's general obligations:				
	(a) Fixed obligations	-	lump	sum	
	(b) Value-related obligations	-	lump 8	sum	
	(c) Time-related obligations	month			
	<u>NB</u> The combined total tendered for subitems (a), (b) and (c) shall not exceed 20% of the Tender Sum.				
1300	TOTAL CARRIED TO SUMMARY				

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SCHEDULE A: ROAD CONSTRUCTION

SECTION 1400

ITEM NO	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT
B14.01	<u>HOUSING, OFFICES AND LABORATORIES FOR THE ENGINEER'S SITE PERSONNEL</u>				
	Office and laboratory accommodation:				
	(a) Offices, 6m x 2.4m refitted container	number	1		
	(b) Boardroom, 12m x 2.4m refitted container	number	1		
14.02	(e) Ablution units:				
	(i) Site unit, 1 x male 1 x female	number	1		
	Office and laboratory furniture:				
	(a) Chairs	number	15		
B14.03	(d) Desks, complete with drawers and locks	number	1		
	(f) Conference tables	number	1		
	Office and laboratory fittings, installations and equipment:				
	(a) Items measured by number:				
B14.03 (a)(cont)	(i) 220/250 volt power points	number	3		
	(iii) Double 80 watt fluorescent-light fittings complete with ballast and tubes	number	9		
	(x) Fire extinguishers, 9,0 kg all purpose dry powder type, complete, mounted on wall with brackets	number	4		
	(xi) Air-conditioning units with 2,2 kW minimum capacity, mounted and with own power connection	number	2		
	(xix) Steel plan cabinets	number	1		
	(ii) The provision of min 3G data service with wifi facility, including the cost of data and transmissions in connection with contract administration and data rental (min 2Gig per month)	-	2		16 000.00
			2		
	(ii) Handling costs and profit in respect of subsubitem B14.03(b)(i) above	%	1		
			6		
1400	Carried forward				

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**SCHEDULE A: ROAD CONSTRUCTION****SECTION 1400**

ITEM NO	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT
	Brought forward				
B14.03 (b)(cont)	(ix) Provision of cell phones complete with car kits fitted to vehicles as directed, including all fees and the cost of phone calls in connection with the administration of the Contract	-	-	PC Sum	13 000.00
	(iv) Handling costs and profit in respect of subsubitem 14.03(b)(ix) above	%	R 13 000.00		
	(c) Items measured by area:				
	(vii) Venetian blinds	m² m²	4		
	(viii) Notice boards as specified	number	2		
14.04	Car-ports Services:		2		
14.08	(a) Services at offices and laboratories:			sum	
	(i) Fixed costs	-	lump		
	(ii) Running costs	month	8		
	Provision of photostat, scan and printing facilities (up to A3 size)	month	8		
B14.10	Supply of two-way radios (hand held):				
B14.11	(a) Two-way hand held radio VHF/AM Dittel FSG5 complete with charger, carry bag with strap and vehicle magnetic antenna including adapter cable (one to be used as specified in clause B1230 (b) - including cost of obtaining authority for use from ATNS)	number	2		
1400	TOTAL CARRIED TO SUMMARY				

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**SCHEDULE A: ROAD CONSTRUCTION****SECTION 1500**

ITEM NO	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT
	ACCOMMODATION OF TRAFFIC				
B15.01	Accommodating traffic and maintaining temporary deviations all work airside and lands	-	lump	sum	
B15.03	Temporary traffic-control facilities:				
	(a) Flagmen	man-day	400.00		
	(b) Portable STOP and GO-RY signs	number	6		
	(d) Revolving amber flashing lights	number	20		
	(e) Road signs, R- and TR-series, 1 200 mm in diameter	number	8		
	(f) Road signs, TW-series, 1 500 mm sides	number	6		
	(g) Rectangular road signs, TGS-, TIN- and TW- series (excluding TW-series delineators and barricades)	m²	15		
B15.03 (cont)	(h) Delineators TW401/TW402 (250 mm x 1 000 mm sides):				
	(i) Double sided	number	30		
	(j) Traffic cones 750mm high	number	30		
	(l) Movable barriers				
	(i) Water filled type New Jersey plastic 1.0m high, 2.0m wide (including 5 mm nylon rope between the barrier)	number	70		
	(n) Other traffic control measures ordered by the Engineer				
	(i) Provision of other traffic control measur	Prov	Sum 17	17 000.00	17 000.00
	(ii) Handling cost and profit in respect of subitem B15.03(n)(i)	%	000		
	(p) Temporary taxiway closure crosses	number	4		
	Relocation of traffic control facilities	-	Lump	sum	
15.04	Provision of lighting on site to work areas during night work or where instructed	-	lump	sum	
B15.14	Provision of escort services for all project vehicles	-	lump	sum	
B15.15		-	lump	sum	
1500	TOTAL CARRIED TO SUMMARY				

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SCHEDULE A: ROAD CONSTRUCTION

SECTION 1700

ITEM NO	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT
	<u>CLEARING AND GRUBBING</u>				
17.01	Clearing and grubbing	ha	0.60		
17.04	Clearing and grubbing at inlets and outlets of hydraulic structures	No	10		
17.05	Cleaning out of hydraulic structures:				
	(a) Pipes with an internal diameter up to and including 750 mm	m³	7		
	(b) Pipes with an internal diameter exceeding 750 mm	m³	13		
B17.07	Clearing and grubbing densely wooded areas (not plantations)	ha	4		
1700	TOTAL CARRIED TO SUMMARY				

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**SCHEDULE A: ROAD CONSTRUCTION****SECTION 210**

ITEM NO	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	DRAINS				
21.03	Excavation for subsoil drainage systems:				
	(a) Excavating soft material situated within the following depth ranges below the surface level:				
	(i) 0 m and up to 1,5 m	m³	150.00		
B21.04	(ii) Exceeding 1,5 m and up to 3,0 m	m³	40.00		
	Impermeable backfilling to subsoil drainage systems:				
	(a) Using the excavated material	m³	100.00		
21.06	(b) Using imported selected material	m³	40.00		
	Natural permeable material in subsoil drainage systems (crushed stone):				
	(b) Crushed stone obtained from commercial sources:	m³	50.00		
21.08	(ii) Coarse grade				
	Pipes in subsoil drainage systems:				
	(c) High-density type polyethylene pressure pipes and fittings, complete with couplings (state size, type and class and whether or not perforated):	m	250		
21.10	(iii) 150 mm internal dia, perforated	m²	765		
B21.12	Synthetic-fibre filter fabric (Bidim A4 or similar)				
	Concrete outlet structures, manhole boxes, junction boxes and cleaning eyes for subsoil drainage systems:	number	4		
	(a) Outlet structures	number	4		
21.17	(b) Manhole boxes	number	8		
B21.25	(e) Cleaning eyes	number	5		
B21.26	Test flushing of pipe subsoil drains	m³	10		
	Exposing existing subsoil/stormwater drains, inlets or junction boxes	number	3		
21/22.26	Connecting new sub-surface drainage system to existing stormwater/subsurface drainage system	m³	20		
	Hand excavation to determine the positions of existing services				
2100	TOTAL CARRIED TO SUMMARY				

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**SCHEDULE A: ROAD CONSTRUCTION****SECTION 2200**

ITEM NO	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT
	<u>PREFABRICATED CULVERTS</u>				
22.01	Excavation:				
	(a) Excavating soft material situated within the following depth ranges below the surface level:	m³	100.00		
	(i) 0 m up to 1,5 m	m³	30		
	(ii) Exceeding 1,5 m and up to 3,0 m	m³	130		
22.02	(b) Extra over subitem 22.01(a) for excavation in hard material, irrespective of depth	m³	80		
	Backfilling:	m³	40		
	(a) Using the excavated material	m³	120		
B22.03	(b) Using imported selected material				
	(c) Extra over subitems 22.02(a) and (b) for soil cement backfilling containing 5 % cement*				
	Concrete pipe culverts:	m	55		
B22.17	(b) On class B bedding:				
	(i) Type SC 100 D-load pipes with ogee joints:				
	(1) 600 mm dia				
	Manholes, catchpits, precast inlet and outlet structures complete:				
	(c) Inlet and outlet structure complete as per detail drawing	number	11		
22.26	Hand excavation to determine the positions of existing services	m³	15		
2200	TOTAL CARRIED TO SUMMARY				

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**SCHEDULE A: ROAD CONSTRUCTION****SECTION 3300**

ITEM NO	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT
B33.01	MASS EARTHWORKS				
	Cut and borrow to fill, including all haul.				
	(a) Material in compacted layer thicknesses of 200 mm and less:				
	(i) Compacted to 90% of modified AASHTO density from cut or stockpile (for filling of gravel roads)	m³	3 533		
	(iv) Compacted to 90% of modified AASHTO density (from commercial sources)	m³	700		
	(b) Material in compacted layer thickness of 200 mm and less (for closing up night work areas adjacent operational runway/ taxiways and removed again)				
	(i) Compacted to 90 % of modified AASHTO density	m³	100.00		
	Cut to spoil, including all haul Material obtained from:	m³	3 533		
	(a) Soft excavation	m³	-	.....	rate only
	(b) Intermediate excavation	m³	-	.....	rate only
33.04					
33.10	(c) Hard excavation				
	Roadbed preparation and the compaction of material:	m³	2 460		
33.11	(b) Compaction to 93% of modified AASHTO density	m²	610		
33.12	Three roller passes compaction:				
	(a) Vibratory roller	m³	605		
33/32.06	In situ treatment of roadbed:	m³	3 633		
	(a) In situ treatment by ripping				
	Stockpiling of material				
3300	TOTAL CARRIED TO SUMMARY				

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**SCHEDULE A: ROAD CONSTRUCTION****SECTION 3400**

ITEM NO	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT
34.03	PAVEMENT LAYERS OF GRAVEL MATERIAL				
	Pavement layers constructed from gravel obtained from existing pavement layers:				
	(a) Gravel selected layer compacted to 93% of modified AASHTO density, using:	m³	-	.....	rate only
	(i) Non-cemented material for a compacted layer thickness of 150 mm				
	(b) Gravel selected layer compacted to 95% of modified AASHTO density, using:	m³	-	.....	rate only
	(i) Non-cemented material for a compacted layer thickness of 150 mm				
B34.15	Pavement layers constructed from gravel obtained from commercial sources or approved sources provided by the Contractor, including all haul: pavement layers:	m³	-	.....	rate only
	(a) Gravel selected layer compacted to 93% of modified AASHTO density, using:	m³	2 600		
	(i) Non-cemented material for a compacted layer thickness of 150 mm				
	(b) Gravel selected layer compacted to 95% of modified AASHTO density, using:				
	(i) Non-cemented material for a compacted layer thickness of 150 mm				
	(c) G3 gravel base layer compacted to:				
	(i) 100 % of modified AASHTO density for a compacted layer thickness of 125 mm	m³	-	.....	rate only
	(ii) 100 % of modified AASHTO density for a compacted layer thickness of 150 mm	m³	-	.....	rate only
	(d) G3 for stabilised base layer (chemically stabilized material) compacted to:		370		
	(i) 98 % of compacted AASHTO density for a compacted layer thickness of 200 mm	m³			
	(e) G6 for stabilised subbase layer (chemically stabilized material) compacted to:				
	(i) 97 % of compacted AASHTO density for a compacted layer thickness of 150 mm	m³	1195.00		
34/35.04	Provision and application of water for curing	kilolitre	500		
3400	TOTAL CARRIED TO SUMMARY				

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SCHEDULE A: ROAD CONSTRUCTION

SECTION 3500

ITEM NO	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT
B35.01	<u>STABILIZATION</u>				
	Chemical stabilization extra over unstabilized compacted layers:				
	(c) Gravel subbase 150 mm thick*	m³	1 195		
	(d) Gravel subbase 200 mm thick*	m³	370		
35.02	Chemical stabilizing agent:				
	(a) Ordinary Portland cement	t kilo	145		
35.04	Provision and application of water for curing	litre	140		
3500	TOTAL CARRIED TO SUMMARY				

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SCHEDULE A: ROAD CONSTRUCTION

SECTION 3600

ITEM NO	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT
36.01	<u>CRUSHED-STONE BASE</u>				
	Crushed-stone base:				
	(a) Constructed from type G3 material obtained from commercial sources and compacted to 88% of apparent relative density, 125 mm thick layer	m³	250		
	(b) Constructed from type G3 material obtained from commercial sources and compacted to 88% of apparent relative density, 150 mm thick layer	m³	810		
3600	TOTAL CARRIED TO SUMMARY				

SCHEDULE A: ROAD CONSTRUCTION

SECTION 3600

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SCHEDULE A: ROAD CONSTRUCTION

SECTION 3800

ITEM NO	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT
38.08	<u>BREAKING UP EXISTING PAVEMENT LAYERS</u>				
	Sawing or cutting asphalt or cemented pavement layers:				
	(a) Sawing asphalt		20.00		
3800	TOTAL CARRIED TO SUMMARY				

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SCHEDULE A: ROAD CONSTRUCTION

SECTION 4100

ITEM NO	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT
41.01	<u>PRIME COAT</u> Prime coat: (e) Invert bituminous emulsion	litre	4320.00		
4100	TOTAL CARRIED TO SUMMARY				

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**SCHEDULE A: ROAD CONSTRUCTION****SECTION 4200**

ITEM NO	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT
	<u>ASPHALT BASE AND SURFACING</u>				
42.01	Asphalt base 80 mm thick:				
	(a) Using 35/50 penetration-grade bitumen and 26,5 mm maximum size aggregate:		-		
	(i) Continuously graded	m²	1700.00	.....	rate only
42.02	<u>Asphalt surfacing:</u>				
	(a) 50 mm thick using 50/70 penetration grade binder, continuously graded, medium grade	m²	3700.00		
	(b) 35 mm thick using 50/70 penetration grade binder, continuously graded, medium grade	m²	3 100		
42.04	Tack coat of 30% stable-grade emulsion Binder	litre	-		
42.05	variations (state type):				
	(a) Modified binder A-E2	t t t	-	.....	rate only rate
	(b) 50/70 penetration grade			.....	only rate only
	(c) 35/50 penetration grade	t	-	.....
42.06	Variations in active filler content:				rate only
	(b) Lime	m²	100	.....
42.07	Trial sections				
	(a) 80 mm Asphalt base	m²	200		
	(b) 50 mm A-E2 binder	m²	150		
	(c) 40 mm 50/70 penetration grade binder	number	25		
42.08	100 mm cores in asphalt paving	litre	100		
42.15	Application of prime coat and/or tack coat to the edges of a layer				
4200	TOTAL CARRIED TO SUMMARY				

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SCHEDULE A: ROAD CONSTRUCTION

SECTION 5700

ITEM NO	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT
	<u>ROAD MARKINGS</u>				
57.02	Retro-reflective road-marking paint:				
	(b) Yellow lines (broken or unbroken):				
	(ii) 150 mm wide	km	0.55		
57.06	Setting out and premarking the lines (excluding traffic-island markings, lettering and symbols)	km	0.55		
57.08	Removal of existing, temporary or permanent road markings by:				
	(a) Sand-blasting	m²	0.55		
	(b) Overpainting as temporary measure (with light tack coat application)	m²	0.65		
5700	TOTAL CARRIED TO SUMMARY				

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SCHEDULE A: ROAD CONSTRUCTION

SECTION 5800

ITEM NO	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT
58.03	<u>LANDSCAPING AND PLANTING PLANTS</u>				
	Preparing the areas for grassing:				
	(b) Scarifying for loosening topsoil	ha	2.15		
58.04	(e) Providing and applying chemical fertilizers and/or soil-improvement material:				
	(ii) Superphosphate	t	0.4		
	Grassing:				
	(c) Hydroseeding:				
	(i) Providing an approved seed mixture for hydroseeding	kg	1		
	(iii) Hydroseeding	ha	2.15		
5800	TOTAL CARRIED TO SUMMARY				

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SCHEDULE A: ROAD CONSTRUCTION

SECTION 5900

ITEM NO	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT
B59.03	<u>FINISHING THE ROAD AND ROAD RESERVE AND TREATING OLD ROADS</u> Finishing the Site of the Works	-	lump	sum	
5900	TOTAL CARRIED TO SUMMARY				

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SCHEDULE A: ROAD CONSTRUCTION

SECTION 7100

ITEM NO	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT
B71.22	CONCRETE PAVEMENTS				
	Repair damaged concrete slabs Removed damage slabs and replace with concrete slab: Class 35/19 Mpa concrete. The tendered rate for B71.22 shall include full compensation for all plant, labour and equipment required to repair the damaged slabs as specified. It shall also include full compensation for the procurement and supply, including all haul, of all the materials required as specified. The rates for B71.22 shall also include all saw cutting, breaking out of material, disposing of material, shuttering, texturing and curing of the repaired concrete slabs.	m³	160		
7100	TOTAL CARRIED TO SUMMARY				

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**SCHEDULE A: ROAD CONSTRUCTION****SECTION 7600**

ITEM NO	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT
	<u>CONCRETE PAVEMENTS REHABILITATION</u>				
B76.01	Full depth repairs using hand placed concrete (cement included):				
	(a) Plain and dowel jointed concrete pavement of class 45/19 cement	m ³	35		
	(b) Extra over item B76.01 (a) for rapid hardening concrete	m ³	35		
B76.02	Partial depth repairs using hand placed fine concrete in the following ranges of area (cement type indicated)				
	(a) up to 0.25 m ²	m ³	13		
	(b) exceeding 0.25 m ² and up to 0.5 m ²	m ³	11		
	(c) exceeding 0.5 m ²	m ³	6		
B76.03	Joints				
	(c) Dowel bars (mild steel) (diameter and length indicated)				
	(i) Installed in existing concrete in rehabilitation work	No.	650.00		
	(d) Tie bars (high tensile steel) (diameter and length indicated)				
	(i) Installed in existing concrete in rehabilitation work	No.	55.00		
B76.04		m	1 300		
B76.05	Crack repairs (width after routing indicated) Grouting of	m	1 065		
B76.06	cracks	m ²	80		
B76.07	Partial depth repair using hand placed acrylic resin grout	m	8.50		
B76.08	Spall repairs to joints in existing pavement (Up to 40 mm)	m ³	27		
B76.09	Repair subbase using lean mix concrete Aircraft tie downs:				
	(a) Construct aircraft tie downs into existing concrete or block paving complete as per drawing	No.	5		
B76/57.02	Retro-reflective road-marking paint:				
	(a) White lines (broken or unbroken)	m ²	10.0		
	(i) 150 mm wide	m ²	10.0		
	(b) Yellow lines (broken or unbroken)	m ²	10.0		
	(i) 150 mm wide	m ²	10.0		
	(c) Red lines (broken or unbroken)	m ²	10.0		
	(i) 150 mm wide	m ²	10.0		
	(g) Black lines (broken or unbroken)				
	(i) 150 mm wide				
7600	Carried forward				

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SCHEDULE A: ROAD CONSTRUCTION

SECTION 7600

ITEM NO	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT
	Brought forward				
B76/57.06	Setting out and pre-marking the lines (excluding traffic island markings, lettering and symbols)	km	10.0		
B76/56.10	Complete apron bay parking signage as per drawing P18034-TN-01-TD-004-REV A_APRON BAY PARKING SIGNAGE	No.	6.0		
7600	Total				

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SCHEDULE E: PROFESSIONAL SERVICES

Item	Description	Amount R
1	Construction Manager	
Percentage (%) of the construction value, total amount of Schedule A, B, C, D pricing schedule , of R (excl VAT) for Construction Manager Construction Manager services fee is _____ %		
1.1	Stage 3 - Design Development	
1.2	Stage 4 - Design Documentation	
1.3	Stage 5 - Construction	
1.4	Stage 6 - Close-Out	
1.5	Subtotal 1	
2	CIVIL ENGINEER	
Percentage (%) of the construction value, total amount of Schedule A, B, C, pricing schedule , of R.....(excl VAT) for Civil Engineer Engineer services fee is _____ %		
2.1	Stage 1 – Inception	
2.2	Stage 2 – Concept Development	
2.3	Stage 3 - Design Development	
2.4	Stage 4 - Design Documentation	
2.5	Stage 5 - Construction	
2.7	Construction Monitoring (Level 3) (Resident Engineer)	
2.8	Tests	
2.9	Stage 6 - Close-Out	
2.10	Subtotal 2	
3	Quantity Surveyor	
Percentage (%) of the construction value, total amount of Schedule A, B, C, D pricing schedule , of R.....(excl VAT) for (Quantity surveyor) Quantity Surveyor services fee is _____ %		
3.1	Stage 1 – Inception	
3.2	Stage 2 – Concept Development	
3.3	Stage 3 - Design Development	
3.4	Stage 4 - Design Documentation	
3.5	Stage 5 - Construction	
3.6	Stage 6 - Close-Out	
3.7	Subtotal 3	

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4	<u>Construction Health and Safety Agent</u>	
Percentage (%) of the construction value, total amount of Schedule A, B, C, D pricing schedule, of R.....(excl VAT) for Construction Health and Safety Construction Health and Safety Agent services fee is _____ %		
4.1	Stage 1 – Inception	
4.2	Stage 2 – Concept Development	
4.3	Stage 3 - Design Development	
4.4	Stage 4 - Design Documentation	
4.5	Stage 5 - Construction	
4.6	Stage 6 - Close-Out	
4.7	Provisional sum for Environmental Practitioner	
4.8	Subtotal 4	

5	<u>Electrical Engineer</u>	
Percentage (%) of the construction value, total amount of Schedule A, B, C, D pricing schedule,, of R.....(excl VAT) for Electrical Engineer Engineer services fee is _____ %		
5.1	Stage 1 – Inception	
5.2	Stage 2 – Concept Development	
5.3	Stage 3 - Design Development	
5.4	Stage 4 - Design Documentation	
5.5	Stage 5 - Construction	
5.6	Stage 6 - Close-Out	
5.7	Construction Monitoring (Level 2 @ 8hrs per week)	
5.8	Subtotal 5	
6	Subtotal 6 (Sum subtotal 1- 5)	
7	*Add Disbursements (10% of professional fees/ key personnel)	
	Subtotal 7	
	Total (Carried to Summary)	

- * Provide detailed breakdown of all items catered for under the disbursement as directed in **C.2.1.1 Design and Professional Team above**
- * Include airport personal and vehicle permits cost as per rates provided in **C.2.1.1 Design and Professional Team**

C2.3.3 Summary of Schedules

SUMMARY OF SECTIONS

Section	Description	Amount (Rand)
1200	GENERAL REQUIREMENTS AND PROVISIONS	.....
1300	CONTRACTOR'S ESTABLISHMENT ON SITE AND GENERAL OBLIGATIONS	.....
1400	HOUSING, OFFICES AND LABORATORY FOR THE ENGINEER'S SITE PERSONNEL	.....
1500	ACCOMMODATION OF TRAFFIC	.....
1700	CLEARING AND GRUBBING	.....
2100	DRAINS	.....
2200	PREFABRICATED CULVERTS	.....
3300	MASS EARTHWORKS	.....
3400	PAVEMENT LAYERS OF GRAVEL MATERIAL	.....
3500	STABILIZATION	.....
3600	CRUSHED STONE BASE	.....
3800	BRAKING UP EXISTING PAVEMENT LAYERS	.....
4100	PRIME COAT	.....
4200	ASPHALT BASE AND SURFACING	.....
5700	ROAD MARKINGS	.....
5800	LANDSCAPING AND PLANTING PLANTS	.....
5900	FINISHING THE ROAD AND ROAD RESERVE AND TREATING OLD ROADS	.....
7100	CONCRETE PAVEMENTS	.....
8100	TESTING MATERIALS AND WORKMANSHIP	.....
TOTAL SCHEDULE A: ROAD CONSTRUCTION		.....
SCHEDULE B: ELECTRICAL WORKS		
B	ELECTRICAL WORKS	.....
SCHEDULE C CONCRETE APRON REHABILITATION WORKS		
C_7100	CONCRETE PAVEMENTS	.....
C_7600	CONCRETE PAVEMENT REHABILITATION	.....
TOTAL SCHEDULE C: CONCRETE APRON REHABILITATION WORKS	
SCHEDULE D: TAXILANE EXTENSION WORK		

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D TAXILANE EXTENSION WORKS

CONTRACT NO: _____ DESIGN AND CONSTRUCTION OF PAVED ACCESS ROADS TO RUNWAYS, TURN PAD FOR RUNWAY 24, CONCRETE APRON REFURBISHMENT AND EXTENSION OF TAXILANE AT KING PHALO AIRPORT.

SUMMARY OF SCHEDULES

Schedule / Line	Description	Amount (Rand)
A	SCHEDULE A	.....
B	SCHEDULE B	.....
C	SCHEDULE C	.....
D	SCHEDULE D	.....
E	SCHEDULE E	.....
1	TOTAL OF SCHEDULES ABOVE	.....
2	CONTINGENCIES (10% OF LINE 1 ABOVE)	.....
3	CONTRACT PRICE ADJUSTMENT (Provisional Sum)	638 155.00
4	SUBTOTAL OF LINES 1, 2 AND 3 ABOVE	.....
5	VALUE ADDED TAX (15% OF LINE 4 ABOVE)

TOTAL OF LINES 4 AND 5 ABOVE (CARRIED FORWARD TO FORM OF OFFER)

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C2.3 DECLARATION (In respect of completeness of Tender)

I/we, the undersigned, do hereby declare that these are the properly priced according to part C2.2 of this Contract Document in consecutive order upon which my/our tender for
BID NO. : _____ DESIGN AND CONSTRUCTION OF PAVED ACCESS ROADS TO RUNWAYS, TURN PAD FOR RUNWAY 24, CONCRETE APRON REFURBISHMENT AND EXTENSION OF TAXILANE AT KING PHALO AIRPORT. has been based.

SIGNATURE OF TENDERER/S

DATE

C3: Employer's Works Information

- C3.1 Description of the Works
- C3.2 Professional Services Scope of Work
- C3.3 Engineering
- C3.4 Procurement
- C3.5 Construction
- C3.6 Management
- C3.7 Particular Specifications: Civil
- C3.8 Other Specification

TERMS AND ABBREVIATIONS

Engineer: "Engineer" referred to in the works information also refer to the Supervisor for this contract, the details thereof as stated in Part C1.2 Contract data.

The Client: "The Client" referred to in the works information is synonymous to the The Employer for this contract, the details thereof as stated in Part C1.2 Contract data.

C.3.1 DESCRIPTION OF THE WORKS

C3.1.1 EMPLOYER'S OBJECTIVES

The Employer's objective is to construct runway access roads and turning pad at Runway 24 at East London Airport to comply with the relevant recommended standards and practices in ICAO Annex 14 and CAR Part 139.02.7

C3.1.2 OVERVIEW OF THE WORKS

The work to be performed under this contract comprises mainly of the following:

- Construction of Code D runway turning pad at runway 24 threshold
- Construction of five (5) 90 m access roads for heavy vehicles (fire trucks) at the four runway thresholds and in-situ rip and re-compact up to 1 km long
- Construction of three (3) 90 m access roads for light vehicles adjacent to the runway and in-situ rip and re-compact for the rest of the access road
- Demolishing of one (1) access roads for light vehicles adjacent to the secondary runway
- Rehabilitation of road leading to the maintenance department
- Concrete apron repairs including; edge breaks, corner breaks, spalling, joints to be sealed, cracks with good interlocking to be seal and concrete blocks with no interlocking/ pumping to be replaced. Portion of the existing paint markings on the Apron to be reinstated.

The following aspects will be addressed in this project:

- Construction of sub-surface drains along the turning pad at runway 24 to the nearest manhole
- Repairs to concrete apron
- Sandblasting of existing paint markings at Runway 24 and addition of new paint markings indicating the turn movement at Runway 24
- Removal and protection of existing edge lights and reinstating thereof.

C3.1.3 EXTENT OF THE WORKS

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

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

(a) General

General work operations include:

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

(b) Pavement rehabilitation

Work will have to be undertaken in phases taking the current traffic pattern into consideration and ensuring that the airport will still be operational during the construction period.

Construction adjacent to the Runway 11/29 (main runway) will only be allowed during non-operational hours of the airport, i.e. predominantly night work. The work areas are:

- Within 50 m from the runway edges
- Between threshold up to the instrument landing system (ILS) for work adjacent to the approach lights/ in line with the runway

Construction on the Runway 06/24 (secondary runway) will be allowed during operational hours of the airport. The current operational hours for planning purposes at the airport are:

- Monday to Friday: 06:30 – 20:45
- Saturday: 08:00 – 18:00
- Sunday: 08:00 – 20:45

However, the runway must be available for emergencies at all times, which may call for quick evacuation of the construction area by the Contractor. The Contractor will not be permitted to stock pile or store any material within the specified safety distances from operational runways, taxiways and aprons in order to minimize evacuation time of an area should it be required in case of emergencies for airport operations.

Work areas will be available at the following time periods:

- Runway 06/24 (secondary runway) All hours on NOTAM
- Runway 11/29 (main runway) From 21h00 to 05h00 (to be confirm that the runway is closed)

No access to any runway works will be allowed during low visibility conditions.

The extent of the works can be summarised as follows:

Runway 11/29 (main runway) access roads

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

- Construction of two (2) 90 m access roads for heavy vehicles (fire trucks) at the runway thresholds and in-situ rip and re-compact up to 1 km long
- Construction of two (2) 90 m access roads for light vehicles adjacent to the runway and in-situ rip and re-compact for the rest of the access road
- Demolishing of one (1) access roads for light vehicles adjacent to the secondary runway

Runway 06/24 (secondary runway) access roads and turning pad at runway 24

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

- Construction of Code D runway turning pad at runway 24 threshold
- Construction of two (2) 90 m access roads for light vehicles adjacent to the runway and in-situ rip and re-compact for the rest of the access road
- Demolishing of one (1) access roads for light vehicles adjacent to the secondary runway

Runway 06/24 (secondary runway) access roads and turning pad at runway 24

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

- Construction of Code D runway turning pad at runway 24 threshold
- Construction of three (3) 90 m access roads for heavy vehicles (fire trucks) at the runway thresholds and in-situ rip and re-compact up to 1 km long
- Construction of one (1) 90 m access roads for light vehicles adjacent to the runway and in-situ rip and re-compact for the rest of the access road

Concrete apron repair works

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

- Edge breaks and corner repairs
- Remove old joint filler, clean and fill joints
- Clean cracks and installing new jointing material
- Repair spalled areas and install new joints
- Concrete blocks with no interlock/pumping to be replaced.

Note: The Contractor to evacuate the apron on the instruction from the Fire Department during emergency situations. The Contractor's staff to assemble at the designated assembly point.

Road leading to maintenance department

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

- Section of surface that failed to be removed and rehabilitated.

(c) Other ancillary Works

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

- At the end of each shift to ensure normal runway operations

- Existing surface markings as to be repainted as directed by the Engineer.
- Aircraft stand designators to be upgraded
- Application of permanent runway and taxiway markings consisting of respectively reflective white and yellow markings using water-based paint complying with ICAO recommendations
- Control dust and other pollution according to the safety plan and work method statements
- The Contractor to remove all equipment and material in case of an emergency when working along Runway 06/24.

(d) Electrical Works

Electrical work is limited in this contract. The contractor shall make every effort to identify all existing underground services. This is especially required when work is carried out within the strips of Runway.

All lights on the runways affected by the remedial pavement works will need to be removed, protected and replaced as indicated.

Provision is made to remove existing elevated runway edge lights and supply and install new runway edge lights.

Taxiway edge lights to be installed on the runway turning pad.

(e) Changes to Scope of Work

It is a condition of this contract that the employer reserves the right to limit the total expenditure on the Works due to possible budget constraints. Should the tender sum exceed the budgeted amount, the scope of the works may be reduced at any time before or during the contract period to ensure that the final contract amount does not exceed the budgeted amount. Refer to Scope of Works sub-clause B1209 (h).

C3.1.4 LOCATION OF THE WORKS

The site of the Works is situated on the airside of King Phalo Airport in the Eastern Cape. The site is under the jurisdiction of the Airports Company South Africa (ACSA). Location of the site is shown on the Layout Plan (Drawing No. P18034-PD-01-RD-001-REV b_GENERAL LAYOUT 1-A1). The contractor's site camp will be situated within Airports Company South Africa (ACSA)'s premises as indicated on the same drawing.

C3.1.5 TEMPORARY WORKS

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

- (a) Signage and markings for the surface movement of aircraft and vehicles.
- (b) Placing and removal of barricades where required.
- (c) All facilities within the Contractor's construction camp. The design shall comply with the specifications where provided in these documents and all statutory requirements such as the Occupational Health and Safety Act and Regulations. The area is to be reinstated upon completion.

Access roads for the construction camp and temporary material stockpile site. These roads are to be designed, constructed and maintained by the Contractor to comply with safety and environmental requirements. They must be reinstated upon completion the Works.

C3.2 Professional Services scope of Work

C3.2.1 Project Manager

Standard and full project management services for the Tarred Emergency Access Roads scope of work as per the Guidelines for Scope of Services in respect of services for such work rendered by persons registered in terms of the Project and Construction Management Professions Act, 2000 (Act No. 48 of 2000).

Project Manager will be the project lead for our professional services appointed on the project.

Extent of the Project Management Services:

- Planning, programming, reporting and management of the condition assessment process (Due Diligence).
- Planning, programming, reporting and management of the phasing and interface of construction so as not to interfere with normal operation of existing terminal spaces.
- Planning, programming and management of operational readiness of areas under the project scope and interface areas.
- Liaison with internal and external project stakeholders to ensure approval and delivery of the project timeously.
- Risk identification, management and reporting during life of the project

C3.2.2 Engineers

Standard and full engineering services under each engineering discipline for the Tarred Emergency Access Roads scope of work as per the latest Guideline for Scope of Service for such Persons Registered in terms of the Engineering Profession Act, 2000 (Act No. 46 of 2000).

Extent of the Engineering Service:

- Planning, design, management of implementation, handover and close out for the multiple disciplines to be provided in the project as tendered and to included but not limited to the following;
- Planning, programming, management and reporting of all condition assessment required to execute all pertinent phases of the project (Due Diligence exercise).
- Planning, programming, management and reporting of the phasing and interfaces of services installations so as not to interfere with normal operations of existing engineering installations and terminal spaces.
- Planning, programming and management of operational readiness of all engineering installations in areas under the project scope and the interface areas.

- Liaison with internal and external project stakeholders to ensure specific compliances crucial to the delivery of the project.
- Risk identification, management and reporting during life of the project.
- Design and specification of engineering services for overall improved life cycle of all engineering services.

C3.2.3 Quantity Surveyor

Standard and full Quantity Surveying services for the alterations and additions work for the Tarred Emergency Access Roads scope of work as per the Guidelines for Scope of Service in respect of services rendered by persons registered in terms of Section 34(2) of the Quantity Surveying Profession Act, 2000 (Act 49 of 2000) guideline of professional fees.

Extent of the Quantity Surveying Services

- Project financial risk assessment, management and reporting.
- Pro-active project budget management and reporting.
- Implement project cost saving solutions on behalf of Client.
- Diligent and proactive project cash-flow management and reporting.
- Project Capitalisation at completion stages of the project.

C3.2.4 Construction Health and Safety Agent

Standard and full project management services for the Tarred Emergency Access Roads scope of work as per the Guidelines for Scope of Services in respect of services for such work rendered by persons registered in terms of Construction Health and Safety Professionals Registered in terms of the Project and Construction Management Professions Act, 2000 (Act No. 48 of 2000).

C3.3 ENGINEERING

C3.3.1 DESIGN SERVICES AND ACTIVITY MATRIX

The responsibilities for design and related documentation are as follows:

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

C3.3.2 EMPLOYER'S DESIGN

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

C3.3.3 CONTRACTOR'S DESIGN BRIEF

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

C3.3.4 DRAWINGS

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

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

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

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

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

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

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issued.

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

C3.5: CONSTRUCTION

C3.3.5 DESIGN PROCEDURES

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

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

C3.3.6 CONSTRUCTION IN CONFINED AREAS

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

C3.4: PROCUREMENT

C3.4.1 PREFERENTIAL PROCUREMENT PROCEDURES

The Works shall be executed in accordance with the requirements specified in Section T1.2, Tender Data (Clause F3.11) and submitted by the Contractor in his Returnable Schedules.

C3.4.2 SUBCONTRACTING

(a) Scope of Mandatory Subcontract Works

The Mandatory Works to be subcontracted are the Electrical Works described in Clause C3.1.3(e) The subcontractor shall be approved by the Engineer.

(b) Preferred Subcontractors

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

(c) Subcontracting Procedures

The electrical works shall be subcontracted to CIDB registered contractors in accordance with the subcontracting procedures set out in the General Conditions of Contract. The subcontractor must have Airfield Ground Lighting (AGL) experience.

(d) Attendance on Subcontractors

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

- The programme of works, and
- The contract requirements, and

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

C3.5: CONSTRUCTION

C3.5.1 WORKS SPECIFICATIONS

(e) Applicable Standard Specifications

The Standard General and Technical Specifications for Civil Works shall be the COLTO - Standard Specifications for Road and Bridge Works for State Road Authorities (1998).

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

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

(f) Applicable National and International Standards

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

- ICAO
- SACAA
- SANS (SABS)

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

(g) Project Specifications

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

(h) Certification by Recognized Bodies

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

C3.5.2 PLANT AND MATERIALS

(a) Plant and Materials supplied by the Employer

Nil

(b) Materials, Samples and Shop Drawings

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

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

C3.5.3 CONSTRUCTION EQUIPMENT

(a) Requirements for Equipment

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

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

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

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

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

(b) Equipment Provided by the Employer

Nil

C3.5.4 EXISTING SERVICES

Specifications related to existing services are provided in the Project Specifications (Section C3.6; Clause B1210)

C3.5.5 SITE ESTABLISHMENT

(a) Services and Facilities Provided by the Employer

The location of and access to a proposed construction camp will be provided to the contractor. Approval for the establishment of a construction camp must be obtained from Airports Company South Africa (ACSA). The Contractor is responsible for all arrangements for obtaining all necessary approvals, establishment and subsequent removal and reinstatement of his construction camp. Note that there is no electricity, water or sewer available at the construction camp the contractor to provide all services. These services will be at the expense of the contractor. The contractor to comply with Airports Company South Africa requirements for temporary ablutions (for example: separate chemical ablution facilities for male and females).

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

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

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

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

(b) Facilities Provided by the Contractor

The requirements for facilities to be provided by the contractor for use by the employer and his agents such as office, ablution and laboratory facilities are stated in Part C3.6, Section B1400.

The contractor shall make his own arrangements for the supply of electrical power supply, water (see Clause B1219), telecommunication services, ablution facilities, sewer services, first aid facilities and other services, the payment thereof and all reinstatements required upon completion. No direct payment will be made to the Contractor for the provision the services. The cost thereof shall be deemed to be included in the rates and amounts tendered for the various items of work for which these services are required.

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

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

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

(c) Storage and Laboratory Facilities

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

(d) Other Facilities and Services

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

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

(e) Vehicles and Equipment

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

(f) Advertising Rights

Only one sign board for the Contractor and his subcontractors may be erected at the entrance to the construction camp. Also refer to Clause 1207 (Volume 2) and Clause B1207 of the Project Specification (C3.6).

(g) Notice Boards

A construction notice board complying with the SAICE specifications must be provided and erected at a position to be agreed with the Employer's Agent. The cost of the supply and erection

of this notice board must be included in the establishment cost of the Contractor. Also refer to Clause 1207 (Volume 2) and Clause B1207 of the Project Specification (C3.6).

C3.5.6 SITE USAGE

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

C3.5.7 ALTERATIONS, ADDITIONS, EXTENSIONS AND MODIFICATIONS TO EXISTING WORKS

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

C3.5.8 WATER FOR CONSTRUCTION PURPOSES

The Contractor must make all arrangements for the transport, storage and distribution of water required for construction purposes and for his own use and at his own cost (allowed for in the relevant tendered rates). Alternatively, water can be purchased from Airports Company South Africa (ACSA) at a prescribed rate, the contractor to supply own stand pipe and meter. Refer Clause B1219 for further details.

C3.5.9 SURVEY CONTROL AND SETTING OUT OF THE WORKS

The Contractor shall place beacons in concrete, marked and certified by a professional land surveyor. Beacons shall be check-levelled during construction to confirm the accuracy when instructed by the Employer's Agent. Refer Clause B1206 for further details.

C3.6: MANAGEMENT

C3.6.1 MANAGEMENT OF THE WORKS

(a) Planning and Programming

A simple example of a construction programme is presented on the next page to assist the Contractor in the preparation of his Initial Programme. This programme is provided for illustrative purposes only and the Contractor must draw up his own programme that complies with all requirements of this project and which suits his own resources. Detailed specifications for the compilation and management of the construction programme are stated in Section C3.6 (Clause B1204) and in Clause 4 of the Manual of Procedure of Working Airside (Volume 5).

(b) Sequence of the Works

The sequence of the Works will be determined by the logical order of activities to meet the required completion date and availability to construct the works base on day and night work:

- (a) The contractor shall also allow time in its programme for trial sections of the asphalt mixes.
- (b) A minimum of seven (7) days advance notice from the contractor is required to switch between work areas in order to allow for the required NOTAMs (Notice to Airmen) prepared by Airport Management.

(c) Methods and Procedures

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

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

(d) Quality Plans and Control

The requirements for Quality Plans and Control are stated in Section B1205 of the Project Specification (C3.6).

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Add programme here (simplistic example below)

MAIN ACTIVITY	MONTHS				
	1	2	3	4	5
Establishment					
Main runway access roads					
Secondary runway turning pad					
Secondary runway access roads					
Main apron rehabilitation works					
Drainage					

(e) Construction Method Statement

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

The Method Statement shall include:

- i. All measures to be implemented to comply with the requirements of the Procedure Manual for Working Airside (Volume 5).
- ii. All measures to be implemented to comply with the requirements of the OHS Act.
- iii. A contingency plan to deal with interruptions of shifts by inclement weather, plant breakdowns or emergency closures of the work areas.
- iv. Special measures, such as availability of back-up plant, to be implemented in normal shifts to comply with the Project Specifications.
- v. Measures and equipment that will be used on site to limit the ingress of water into the excavations and to remove rain water from the excavations.
- vi. Measures to protect services (above and below surface) during construction.
- vii. Procedures to ensure that the whole work area is safe before removing staff or handing over of the site at the end of each work shift.
- viii. A watchman to remain on site of excavations/construction with telephone contact to the contract manager in case of emergency.
- ix. The cost of complying with the Airports Company South Africa (ACSA) approved method statement is deemed to be covered by the tendered rates for the Contractor's General Obligations.

(f) Environment

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

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

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

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

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

(i) Recording of Weather

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

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

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

(j) Format of Communications

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

- Site instructions.
- Requests for inspections.

(k) Key Personnel

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

(l) Management Meetings

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

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

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

(m) Daily records

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

(n) Bonds and Guarantees

Original copies of the bonds and guarantees must be lodged at the office of Airports Company South Africa (ACSA), East London Airport and one copy of each must be kept on site with the Employer's Agent's representative. On release, the bond and guarantees can be collected from Airports Company South Africa (ACSA).

(o) Payment Certificates

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

Payment certificated need to be submitted to Engineer on the 20th of the month. The Engineer has 5 days to evaluate the payment certificate. The payment certificate needs to be submitted to Airports Company South Africa on the 25th on the month.

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(p) Permits

All requirements in connection with the application for and usage of permits are stated in the Airside Manual (Volume 5) and Clause B1230 (Project Specification C3.6).

(q) Insurance Provided by the Employer

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

C3.5.2 HEALTH AND SAFETY

(a) Health and Safety Requirements and Procedures

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

(b) Barricades and lighting

Requirements for the provision and usage of barricades and lighting are stated in Volume 5 and Sections 1300 and 1500 of the Specifications.

(c) Traffic Control

Safety requirements and procedures where the Contractor has occupation of taxiways, runways or roads are stated in **Volume 5 and Section 1500 of the Specification**.

C3.7: PARTICULAR (PROJECT) SPECIFICATIONS: CIVIL

The Standard Specifications provide, in certain clauses, for a choice to be specified in the Construction Specifications between alternative materials or methods of construction and for additional requirements to be specified to suit a particular contract. Details of such alternatives or additional requirements applicable to this Contract are contained in this part of the Specifications. It also contains some additional specifications required for this particular contract.

The number of each clause and each payment item in the Particular (Project) Specifications consists of the prefix B followed by a number corresponding to the number of the relevant clause or payment item in the Standard Specifications. The number of a new clause or a new payment item, which does not form part of a clause or a payment item in the standard specifications and is included here, is also prefixed by B followed by a new number. The new numbers follow on the last clause or item number used in the relevant section of the standard specifications.

The Standard Specifications as well as the Particular (Project) Specifications refer to the 'Engineer' whereas the NEC ECC, 2013, (NEC ECC 2013) refer to the 'Supervisor'. In all cases where reference is made to the Engineer in the Standard Specifications or the Project Specifications, it shall have the same meaning as the Supervisor as defined in the NEC ECC.

C3.6.1 SECTION 1100: DEFINITIONS AND TERMS B1107**CARRIAGEWAY AND FREEWAY**

Add the following:

"The carriageway or freeway shall also mean the asphalt surface areas of the runways, RETs, taxiways and the concrete aprons."

B1115 GENERAL CONDITIONS OF CONTRACT

Replace Clause 1115 with the following:

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

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

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

CHANGES TO ALL REFERENCES BY THE COLTO STANDARD SPECIFICATIONS TO THE COLTO GENERAL CONDITIONS OF CONTRACT AND 2015 GENERAL CONDITIONS OF CONTRACT FOR CONSTRUCTION WORKS (GCC 2015)

COLTO Standard Specifications		Reference to COLTO General Conditions of Contract 1998 shown in the Standard Specifications		Equivalent reference to General Conditions of Contract for Construction, 3 rd edition, 2015, applicable to this Contract	
Clause No	Page No	Clause No	Description or Reference	Clause No	Description or Reference amended to
1115	1100-2		Definition of GCC		Definition GCC 2015
1202	1200-2	15	Construction programme	5.6	Construction programme
1204	1200-2		General reference to GCC		Applicable to GCC 2015
1206	1200-3	14	Setting out of works		Clause amended in 1206 of Specifications
1209(a)	1200-4		General references to GCC		Applicable to GCC 2015
1209(e)	1200-5	52	Valuation of material brought onto site	6.10	Valuation of material brought onto site
1210	1200-5	54	Certificate of practical completion	5.14	Certificate of Practical Completion
1212(1)	1200-7	49	CPA on alternative designs	6.8	CPA on alternative designs
1215	1200-9	45	Extension of time for completion due to abnormal rainfall	5.12	Extension of time for completion due to abnormal rainfall
1217	1200-10	35	Care of the works	8.2	Care of the works
1303(ii)	1300-1		General reference to GCC		Applicable to GCC 2004
1303(iii)	1300-1	49	Price adjustment Item 13.01 (a)	6.8	Price adjustment Item 13.01 (a)
1303 (iii)	1300-2	49	Price adjustment Item 13.01 (b)	6.8	Price adjustment Item 13.01 (b)
1303 (iii)	1300-1/2	53	Variations exceeding 15%	6.11	Variations exceeding 15%
1303	1300-2	12	Payment Item 13.01 (c)	5.3	Payment Item 13.01 (c)
1303	1300-2	45	Payment Item 13.01 (c)	5.12	Payment Item 13.01 (c)
1403(c)(ii)	1400-4	40 (1)	Variation for rented accommodation	6.4.1	Variation for rented accommodation

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COLTO Standard Specifications		Reference to COLTO General Conditions of Contract 1998 shown in the Standard Specifications		Equivalent reference to General Conditions of Contract for Construction, 3 rd edition, 2015, applicable to this Contract	
Clause No	Page No	Clause No	Description or Reference	Clause No	Description or Reference amended to
1505	1500-3	40	Variation for temporary drainage	6.4	Variation for temporary drainage
Item 15.08	1500-8	48	Payment of Provisional Sum	6.6	Payment of Provisional Sum
Item 15.09	1500/8	48	Payment of Provisional Sum	6.6	Payment of Provisional Sum
Item 15.11	1500-8	48	Payment of Provisional Sum	6.6	Payment of Provisional Sum
Note (2)	3100-4	40	Payment for prospecting for materials	6.4	Payment for prospecting for materials
3204(b) (iii)	3200-2	40	Payment for oversize material	6.4	Payment for oversize material
3303(b)	3300-2	2	Engineer's decisions, with reference to materials classification	3	Employer's Agent's decisions, with reference to materials classification
Item 44.06	4400-3		General reference to GCC, PC Sums	6.6.2	General reference to GCC, PC Sums
Item 45.06	4500-3		General reference to GCC, PC Sums	6.6.2	General reference to GCC, PC Sums
5803 (c)	5800-3	40	Variation, for landscaping	6	Variation, for landscaping
5805 (d)	5800-4	40	Variation, for grassing	6	Variation, for grassing
Item 58.10	5800-10	48	Payment for Extra Work	6.6	Payment for Extra Work
8103 (c)	8100-1	40	Variation, for testing material	6	Variation, for testing material
Item 81.02	8100-26		General reference to GCC, Provisional Sums	6.6	General reference to GCC, Provisional Sums
Item 81.03	8100-26	22	Clearance of site on completion, with reference to core drilling	5.15.1	Clearance of site on completion, with reference to core drilling

”

B1136 ROAD PRISM

Add the following:

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

Add the following definitions and terms to Section 1100 of the Standard Specifications: (Also refer to the definitions provided in the Airside Manual – Volume 5)

B1156 AIRPORT ROADS

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

B1157 AIR TRAFFIC

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

B1158 CONTROL TOWER

Means an air traffic control unit established to provide an air traffic control service.

B1159 INSTRUMENT LANDING SYSTEM CATEGORY I (ILS CAT

Means an approach and landing aid designed to identify an approach path for exact alignment and descent of an aircraft making a landing with a runway visual range of 800 m and a decision height of 60 m.

B1160 INSTRUMENT LANDING SYSTEM CATEGORY II (ILS CAT II)

Means an approach and landing aid designed to identify an approach path for exact alignment and descent of an aircraft making a landing with a runway visual range of 400 m and a decision height of 30 m.

B1161 INTERNATIONAL CIVIL AVIATION ORGANISATION (ICAO)

Means a specialised agency of the United Nations with a membership of 183 Contracting States as of August 1994.

B1162 LANDING AREA

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

B1163 THRESHOLD

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

B1164 PARTY, PARTIES AND THIRD PARTY

'Party' and 'Parties' means the Client and the Consultant and 'Third Party' means any other person or entity as the contract requires."

B1165 COMPACTION

In December 2017 the THM1 will cease to exist and be replaced by SANS 3001. In preparation for this change-over, the client has already adopted the new test methods and all site Laboratories are required to perform testing according to the SANS 3001 test methods.

Therefore, the standard for compaction efforts should change from Modified AASHTO Density as per TMH1 Test Method to Maximum Dry Density (MDD) as per SANS 3001. Where reference is made to compaction or of Modified AASHTO Density in the tender documentation or the standard specifications or wherever there is conflict between the tender documentation and the standard specifications, the SANS 3001 specification and terminology shall govern."

C3.6.2 SECTION 1200: GENERAL REQUIREMENTS AND PROVISIONS**B1202 SERVICES**

Add the following after the second paragraph:

"The owners of services affected under this Contract are all under the control of the Airports Company South Africa whose representative must be contacted regarding the location of all services in the construction area. Inspections shall be undertaken by means of the authority's service detectors and such inspections shall be attended by the Contractor and the Engineer's Representative. No payment shall be made to the Contractor for attending these inspections.

The following existing surface and subsurface services are currently known and exact locations should be determined with service detection and inspection.

Service	Approximate Location
Runway edge lights	Lights and cables run next to the runway

Protection and/or relocation of certain services will be required. The Engineer will issue instructions after location and exposure of these services. No large compaction equipment will be allowed to work within 10 m of any ground mounted frangible light fixtures or any other navigational equipment without approval by the Engineer. The contractor shall allow for a 1,5 ton sit-on roller or similar compaction equipment approved by the Engineer to work within 10 m of the navigational equipment. No additional payment will be made for work close to the equipment as specified above."

Add the following to the sixth paragraph:

"The Contractor shall also be liable for any loss or consequential loss suffered by the owner of a service which is damaged by the contractor's operations, e.g. loss of the ILS or Runway lighting due to a power failure."

Add the following after the last paragraph:

"This work is planned to be executed in close proximity of approach, edge lights and runway closure crosses and must be executed without interfering with the operation of these lights. The contractor shall ensure that the position of the cables is known to himself and his personnel and shall take all reasonable care to avoid damage to the cables, lights or transformers. Protective covers and markers shall be used as required to protect the lights from being damaged or covered by products (e.g. bituminous) whilst the work is carried out. No additional payment will be made to protect the lights.

Should existing services be damaged, the contractor shall give adequate notice to all concerned and leave enough time after completing a particular work shift to allow for the reinstatement of the cables before opening the runway to air traffic.

Where applicable, existing edge and centre lighting systems for the runway and taxiways need to be kept operational during the course of the project. A number of these lights will need to be raised to match the new level of the surfacing. Payment for this work will be covered under pay item B12.08.

B1204 PROGRAMME OF WORK**(a) General requirements**

Delete the first paragraph and add the following:

"The Contractor shall submit his programme within the time stated in the Contract Data to the Engineer for approval. The programme shall be in the form of a bar chart (Gantt chart) or any other time-activity form acceptable to the Engineer, and shall clearly show:

- (i) The proposed rate of progress in order to complete the Works within the required period as tendered, showing the various activities, their durations and proposed resourcing levels (major plant and labour) for each element of the Works. Sufficient detail shall be provided to enable the Engineer to be able to gauge construction progress. All activities, including establishment on site, trimming and finishing and the completion of all minor ancillary works are to be included in the programme.
- (ii) The sequence of activities and any dependencies (time or resource related) between them.
- (iii) The critical path activities.
- (iv) The anticipated value of work to be done during each month.
- (v) Other information specifically required by the Engineer

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

- (i) Working times and all other constraints stated in Volume 5.
- (ii) Requirements of Clause B1230.
- (iii) Expected weather conditions and their effects (Clause B1215).
- (iv) Known physical conditions or artificial obstructions.
- (v) The accommodation and safeguarding of public and air traffic.
- (vi) Dealing with, altering and installing services.
- (vii) The work to be undertaken by any sub-contractors. This work must be integrated into the programme of the main contractor.
- (viii) All other actions required in terms of this contract.
- (ix) Interim milestone dates and restrictions on the extent of work areas available at a given time (Section C3.5.1).
- (x) Airside access for "normal hours" working as follows (if required):
 - Sunday: 08:00 – 21:00
 - Monday: 06:00 – 20:30
 - Tuesday: 06:30 – 20:30
 - Wednesday: 06:00 – 21:00
 - Thursday: 06:30 – 20:30
 - Friday: 06:30 – 20:45
 - Saturday: 07:45 – 18:00
- (xi) Airside access for "after hours" working as follows:
 - Monday – Sunday
 - Runway 11/19 (main runway): From 21:00 – 05:00 (to be confirmed timeously with Airport Management when preparing for night work shifts)

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

The following details shall be submitted together with the programme:

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

The Contractor shall base his initial programme of work on the scope of the work as described in the Scope of Works and the Bill of Quantities. This programme shall be reviewed on a regular basis by the Contractor in accordance with changing circumstances, delays and amendments to the work ordered

by the Engineer as a result of further examinations made by him.

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

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

Monthly Meeting Programme:

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

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

Weekly Meeting (Fortnightly Rolling) Programme)

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

Add the following subclause:

“(c) Safety and Contingency Plan

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

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

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

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

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

B1205 WORKMANSHIP AND QUALITY CONTROL

Delete the second to fifth paragraph and replace with the following:

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

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

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

Insert the following new subclauses:

(a) "Laboratory for process control testing

The Contractor shall engage the services of a SANAS accredited, independent testing laboratory for the testing of material and workmanship to ensure compliance with the requirements of the specifications. This also include all tests required for mix design approval.

No separate payment will be made for such testing, the cost of which will be deemed to be included in the rates in the Schedule of Quantities. The Contractor's test results shall be submitted to the Engineer for approval, and follow-on work will be subject to such approval having been given. No payments will be certified if tests have not been submitted.

Testing shall be performed in accordance with Section 8200 of the COLTO Standard Specifications and/or as indicated on the construction drawings."

B1206 THE SETTING OUT OF WORK AND PROTECTION OF BEACONS

Add the following to this clause:

"In order to comply with Clause 1206 of the Specification the Contractor shall contract or employ a professional land surveyor and supporting team who will check the reference and level beacons. Agreement shall be reached with the Engineer on the values of the beacons to be used. It is the Contractor's responsibility to maintain and protect all reference beacons."

Replace the requirements of the second to the third last paragraph with the following:

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

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

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

In the last paragraph, the first part of the sentence shall be changed as follows:

"The setting out of level beacons and level control pegs, the measurement of the existing levels and the setting out of the final levels for construction purposed shall not be measured and paid for directly, and ..."

B1207 NOTICES, SIGNS AND ADVERTISEMENTS

Delete the final paragraph and replace with the following:

"All signboards erected in accordance with the drawings or as approved advertisements for the Contractors establishment, shall be removed at the same time as the Contractors de-establishment. Payment under subitem B13.01 for the final instalment of 15% of the tendered lump sum shall not be made unless all the advertisements, notices and temporary signs have been removed."

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B1209 PAYMENT

Add the following to the first paragraph of Clause 1209(b):

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

(c) The meanings of certain phrases in payment clauses

- (i) Procuring and furnishing...(material)

Add the following:

"Payment for procuring and furnishing material from commercial sources shall include all transport costs, irrespective of distance hauled."

Add the following new subclauses:

(g) Work in restricted areas

All work in restricted areas shall be allowed for in the tendered rates in the Bill of Quantities. No additional payment or claim will be entertained for restricted work.

(h) Rates to remain unchanged when scope of work changes

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

- (i) Notification of the change to the scope of work is given in writing within 28 days of the tender closing date.

- (ii) The value of the increase or reduction in the scope of work does not alter the tendered sum by more than 20%."

B1215 EXTENSION OF TIME RESULTING FROM INCLEMENT WEATHER AND DELAYS CAUSED BY ACTIONS OF AIRPORT AUTHORITIES

Delete the entire clause and replace with the following:

Change the existing heading of clause 1215 to read as above and wherever the expression 'abnormal rainfall' is encountered replace it with '*inclement weather*' and make the following changes to *Method (ii) (Critical-path method)* which will apply to this Contract:

Add the following as a new paragraph:

"(a) Extension of time resulting from abnormal rainfall, very cold weather or other forms of inclement weather shall be calculated according to the requirements of Method (ii) (Critical-path method). The value of "n" working days per calendar month as specified in this clause shall be as given in Table B1215/1 below. If no abnormal rainfall or other inclement weather periods occur during a specific calendar month (or months), the n-values as specified shall not be taken as accumulating over the contract period. If the "n"-days allowed for in the programme of work are not taken up by standing time

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due to abnormal rainfall or inclement weather conditions, they will fall away and will not be considered in extension of time claims that may arise later during the contract period.

Table B1215/1: Average delays due to inclement weather ('n')

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Tot
Rainfall 1.0 - 5.0 mm (for information only)	4.6	4.9	4.1	3.9	1.9	1.7	1.5	2.7	2.8	4.6	4.6	5.4	57.7
Rainfall > 5.0 mm ("n")	2.1	1.1	1.9	1.1	0.6	0.5	0.6	1.1	1	1.7	1.6	1.3	28.6

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

The value 'n' is the average number of days on which it is expected that there will be inclement weather at East London Airport. No paving will be allowed when expected temperature is below 4°C for BRASO and 15°C for BRUTFC

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

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

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

- (b) Extension of time resulting from delays during shifts caused by operations of the Airport shall be allowed for in the contractor's programme. The number of working days to be allowed for in the Contractors programme is 50 days for the full contract period. The criteria listed in (i) and (ii) above will also apply to this extension of time.

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

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

B1219 WATER

Add the following to the first paragraph:

"Water for construction purposes will be made available by the contractor for the site camp. Water will be purchased from Airports Company South Africa (ACSA) at R10 per kilolitre. The contractor shall allow in his rates for annual municipal increases. Airports Company South Africa (ACSA) will invoice the contractor on a monthly basis for use of water. The first municipal water increase will be on 1 July 2019."

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B1225 HAUL ROADS

Add the following:

"The usage and selection of haulage roads on the employer's (Airports Company South Africa (ACSA)) premises and on the site will be coordinated on a daily basis between the Contractor, the Engineer's Representative and the Employer's representative."

Add the following new clauses:

"B1230 PROJECT CRITERIA AND REQUIREMENTS AT OPERATIONAL AIRPORTS

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

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

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

(a) Airport management and air traffic control responsibilities

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

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

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

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

(b) Radio communication on the airport

Refer to Clause 14 of Volume 5.

Two handsets must be provided to the Engineer for this purpose and must be handed over in a working condition to the Employer at the completion of the Contract. The Contractor's traffic safety officer and the Construction Manager shall complete a radio operator's basic course at Airports Company South Africa (ACSA) before commencement of the works. The Contractor shall be responsible for any maintenance costs, damages or loss of these sets. Payment Item B14.03(xxiv) shall be deemed to include all costs of the Contractor in this regard (including training of relevant personnel).

(c) Airport security

Refer to Clause 16 of Volume 5.

(d) Movement on the airport

Refer to Clause 17 of Volume 5.

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

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

All construction vehicles and self-propelled equipment to be utilised within the airport security area shall be fitted with a boldly displayed identification number (minimum dimension 600 mm, line thickness 75 mm) on a white background on either side of the vehicle or equipment. A record of all identification numbers and related vehicles shall be available at all times for perusal by the authorities or the Engineer. The cost for providing and using these identification numbers must be included under Pay Item B13.01.

- (ii) Crossing points

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

- (iii) Barricades, lights and markings

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

- (iv) Dust and pollution

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

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

- (f) Traffic safety officer**

Refer to Clause 9.8 of Volume 5.

A traffic safety officer shall be appointed by the Contractor. This person shall be a senior member of the site management team who has been duly authorised to perform his duties on his own initiative and to exercise control over others. He must also complete a communications training course successfully

at the Airport Control Centre after which a license will be issued to him. He shall be on site full-time during the execution of the works and general site safety shall at all times be his first priority. The traffic safety officer shall liaise directly with the Engineer, airport control and air traffic control regarding matters related to safety.

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

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

(g) Provision of Permits

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

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

Permits

Vehicles Permits	
<i>Duration</i>	<i>Cost</i>
Permanent	
Add on	R 0.00
Temporary	
1 day	R 37.92
2 days	R 71.22
3 days	R 104.53
1 - 3 months (done on APIS)	R 263.63
4 - 6 months (done on APIS)	R 520.79
6 - 12 months (done on APIS)	R 1 055.44
Penalty lost	R 1 955.48
Personal Permits	
<i>Duration</i>	<i>Cost</i>
Permanent	
AVOP	R 63.27
1 st Lost card	R 126.54
2 nd Lost card	R 249.75
Cell phone permits	R 53.19
1 st lost card	R 126.54
2 nd lost card	R 249.75
3 rd lost card	No permit will be issued
Photo permit with card holder and lanyard	R 225.71
Photo permit without card holder and lanyard	R 210.90
1 st lost card	R 351.51

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2 nd lost card	R 508.75
3 rd lost card	No permit will be issued
Damage card - reprint	R 126.54
Upgrading category	R 126.54
Temporary	
1 day	R 31.45
2 - 5 days (laminated and clip)	R 43.80
6 days and over (with lamination)	R 210.90
Other	
Lamination	R 4.80
String	R 10.56
Card holder	R 10.56
Crocodile clip	R 4.80

(h) Windrow of material

During the improvements of the side strips for both runways, materials will be temporarily windrowed outside the work areas. No windrows shall be allowed within 37.5 m of the runway edge of both runways of any threshold. Windrow heights shall also be managed to ensure that they do not exceed Airports Company South Africa (ACSA) maximum obstacle height requirements.

B1231 CONTRACTOR'S ESCORTS

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

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

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

The Contractor will be able to recover the cost of carrying out the duties and responsibilities of the Contractor's escort in the Bill of Quantities. The cost of lights and radio's must be included under Pay Item B13.01.

B1232 MEASUREMENT AND PAYMENT

"Item	Unit
B12.01 Standing time (Plant and Labour)	
(a) Pavement team	hour (hr)

Where unforeseen delays attributable to the airport authorities occur and the contractor suffers lost day or night-shift time over and above the allowance made in Clause B1215 (b), the Contractor will be compensated with paid extensions of time to the contract for the durations lost.

Payment will be made only at the pro rata rate tendered for time related item 13.01 (c), if it is demonstrated that the activities in the shift met the criteria in clause B1215. Such extensions of time will be recorded in bi-weekly meetings.

Item B12.01 is for direct plant and labour costs incurred during such delays. Rates under this item shall include for any additional direct plant, operator and labour costs incurred by the Contractor during such delays. All supervision costs will be deemed to be part of the Contractor's General Obligations and no additional payment will be paid under this item for foremen or managers.

The unit of measurement is each hour or portion thereof of a particular operation that is delayed in excess of 30 minutes for each night shift. Losses for the first half-hour of delay are deemed to be covered in the rates tendered for items of work. The measurement will be taken from the time an instruction is received from the ATC to terminate the operation to the time the operation is commenced again or stopped for a particular shift.

The tendered rate shall include full compensation for all losses incurred by the Contractor."

"Item	Unit
B12.02 Control of dust and FOD pollution at all work areas including haul and site access roads and campsites/site offices	Lump sum

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

"Item	Unit
B12.03 Provision for direct costs incurred for obtaining all personal and vehicle permits and parking cards	

- | | | |
|-----|---|----------------|
| (a) | Actual cost of permits | (Prov Sum) |
| (b) | Handling costs and profit in respect of subitem B12.03(a) | Percentage (%) |

The provisional cost item shall be paid for in accordance with the provisions of the general conditions of contract. Only direct actual permit costs (both vehicle and personal) and actual course fee costs for the AVOP and Airside Induction that can be proved and quantified by submitting invoices from the permit office or approved training provider will be paid for under this item. All indirect costs such as labour time costs, maintaining vehicle and plant roadworthiness in accordance with standards, marking of vehicles

in accordance with the specification and any other indirect cost that is associated with obtaining permits shall be included in the contractor's general obligations in Section 1300.

The tendered percentage is a percentage of the amount actually spent, which shall include full compensation for the handling costs of the contractor, and the profit in connection with obtaining the permits.

“Item	Unit
B12.04 Traffic Safety Officer	Month

The tendered rate shall include full compensation for providing a traffic safety officer and all requirements and obligations to perform the requirements required by the traffic safety officer.

The tendered rate shall be paid monthly. The Engineer has the right to subtract days if the traffic officer has neglected his duties in the opinion of the Engineer.”

“Item	Unit
B12.06 Penalty to be deducted for non-compliance with requirements for accommodation of traffic as set out in B1230 and 1500 and Volume 5	

- | | | |
|-----|-----------------------------------|-------------|
| (a) | Fixed penalty per occurrence..... | Number (No) |
| (b) | Time related penalty..... | Hour (Hr) |

In sub-item B12.04 (a) a fixed penalty of R5 500,00 per occurrence shall be deducted for each and every occurrence of non-compliance with any of the requirements of sections 1500 of the standard specifications, Volume 5 and section B1230 of the particular specifications.

In addition, in sub-item B12.04 (b), a time related penalty of R5 500,00 per hour over and above the fixed penalty in sub-item B12.04(a) shall be deducted for non-compliance to rectify any defects in the accommodation of traffic within a reasonable time after an instruction of this effect has been given by the Engineer. The Engineer's instruction shall state the time in hours for re-instatement of the defects. Should the Contractor fail to adhere to the instruction, the time related penalty will be applied from the time the instruction was given. This also applies to opening after closures.

Item	Unit
B12.07 Compliance with Environmental Specification	

- | | | |
|-------|--|--------------------------------|
| (a) | Time for environmental training..... | Lump Sum |
| (b) | General compliance with Environmental Specification..... | Lump Sum |
| (c) | Penalty for non-compliance with Environmental Specification per occurrence | |
| ..... |  | Negative amount per occurrence |

The tendered lump sum shall include full compensation for all activities and costs associated with environmental training as described in the Environmental Specification under C3.7.2. Payment shall be made on completion of the training.

The Contractor shall include a lump sum for general compliance with the Environmental Specification. Failure to provide any item or comply with any instruction of the Responsible Person will be cause for non-payment of the whole lump sum and for ordering the cessation of works.

Item B12.06(c) makes provision for the deduction of a fixed penalty of R5 000.00 per occurrence in terms of Clause EP 7.4.2 under C3.7.2. Records and penalty allocations of any non-compliance with the Environmental Specification shall be recorded by the Engineer and the total allocation of the penalties shall be deducted as a negative number per occurrence from each month's payment certificate.”

Item	Unit
B12.08 Occupational Health and Safety	

(a) Contractor's initial obligations in respect of the Occupational Health and Safety Act, Construction Regulations and client OHS specifications	Lump Sum
---	----------

The full amount will be paid in one instalment only once all of the conditions below has been complied with:

1. The Contractor has notified the Provincial Director of the Department of Labour in writing of the project.
2. The Contractor has made the required initial Appointments of Employees and Sub-Contractors.
3. The Client has approved the Contractor's Health and Safety Plan.
4. The Contractor has set up his Health and Safety File and the file has been approved by the Engineer's Representative and Client.

Engineer's Representative and Client.

Item	Unit
(b) Contractor's time related obligations in respect of the Occupational Health and Safety Act, Construction Regulations and client OHS specifications	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, the Construction Regulations and client OHS safety specifications which are mainly a function of time. The sum will be paid per month only after payment for Item B12.08(a) has been made and only if the contractor remains in compliance with the OHS requirements. 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
(c) 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.

Item	Unit
(d) 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.

(e) Penalty for non-compliance with OHS Act and Construction Regulation Requirements	Negative amount per occurrence
--	--------------------------------

Item B12.08(e) makes provision for the deduction of a fixed penalty of R5 000.00 per occurrence. Records and penalty allocations of any non-compliance with the OHS requirements shall be recorded by the Engineer and the total allocation of the penalties shall be deducted as a negative number per occurrence from each month's payment certificate.

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

B12.09 Security requirements

(a) Security requirements at the Contractor's Gate,	Provisional Sum (Prov Sum)
---	----------------------------

(b) Handling costs and profit in respect of subitem B12.09(a)	percentage (%)
---	----------------

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The percentage tendered will be paid to the Contractor on the actual amounts paid to adhere to Airports Company South Africa (ACSA)'s security requirements at the Contractor's Gate and shall include full compensation for all costs incurred. No payment shall be granted without proper prove of invoices."

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

B12.10 Relocation and protection of existing services

- (a) Relocation, including lowering or raising protection and/or repair of existing services which are not allowed for in any other items in the schedule of quantities
Provisional Sum (Prov Sum)
- (b) Handling costs and profit in respect of
subitem B12.10 (a) percentage (%)

The percentage tendered will be paid to the Contractor on the actual amounts paid to service providers or quotations submitted and shall include full compensation for all costs incurred. No payment shall be granted without proper prove of invoices."

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

B12.11

- (a) Additional testing (FWD) for structural integrity of the concrete pavement
Provisional Sum (Prov Sum)
- (b) Handling costs and profit in respect of
subitem B12.11 (a) percentage (%)

The percentage tendered will be paid to the Contractor on the actual amounts paid to service providers or quotations submitted and shall include full compensation for all costs incurred. No payment shall be granted without proper prove of invoices."

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C3.6.3 SECTION 1300: CONTRACTOR'S ESTABLISHMENT ON SITE AND GENERAL OBLIGATIONS

B1302 GENERAL REQUIREMENTS

(a) Camps, constructional plant and testing facilities

Add the following to the first paragraph:

"The site for the contractor's office and stores as well as the engineer's office and laboratory will be within Airports Company South Africa (ACSA)'s premises (Landside) and is indicated in the Key Plan Drawing (Volume 4). The contractor shall provide 24-hr security at the camp site as well as a dedicated smoking area under roof as required in terms of legislation. The cost of this will be deemed to be included in item B13.01."

Add the following new subclause:

"(d) Contractor's ablution facilities

The Contractor shall provide sufficient portable chemical latrine units at the work sites as required by legislation i.e. 1:30 employees and catering for males and females. The latrine units shall be serviced daily and kept in a hygienic and orderly state to the approval of the Engineer. No separate payment shall be made for this requirement and the costs thereof shall be deemed to be included in the rates tendered for the Contractor's time-related obligations.

B1303 PAYMENT

"Item	Unit
B13.01 Contractor's general obligations	Month

Insert the following paragraph after the fourth paragraph:

"Should the combined total tendered for subitems (a), (b), and (c) exceed 15% of the tender sum, the tenderer shall state his reasons in writing for tendering in this manner.

If the tenderer should require additional compensation for his obligations under section 1300 (over and above the total tendered for item B13.01 by including such additional compensation in the tendered rates and/or lump sum of items in the schedule of quantities, these items and the value of such additional compensation shall also be indicated in writing in a letter."

Delete the 17th paragraph commencing "The tendered rate per month for subitem 13.01(c) "and replace with:

"The tendered rate per month for subitem B13.01(c) represents full compensation for that part of the contractor's general obligations, which are mainly a function of construction time. The tendered sum will be paid monthly, pro rata for parts of a month, from the Commencement Date until the end of the period for completion of the works, plus any extension thereof as provided in the general conditions of contract, provided that".

Add the following at the end of this pay item:

"The amount payable to the contractor for time related costs arising from extensions of time granted by the employer, where the contractor is fairly entitled to such compensation in terms of the General Conditions of Contract, shall be calculated as follows:

- (i) Account shall be taken of all time related items scheduled in Section 1300, 1400 and 1500
- (ii) All pay items for which the unit of measurement is "month" shall be deemed to be based on a 23-day working month."

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Add the following to this pay item:

“The rate will include for the cost of all Escort requirements as specified in Clause B1231.”

C3.6.4 SECTION 1400: HOUSING, OFFICES AND LABORATORIES FOR THE ENGINEER'S SITE PERSONNEL

B1402 OFFICES AND LABORATORIES

(a) General

Add the following:

"The Resident Engineer's offices shall, amongst other things, have one room at least 6 x 3.5 meters to serve as a conference room. All offices and laboratories shall be supplied with approved burglar proofing."

(b) Offices

Add the following subitems:

"(xviii) Whiteboards of 1,5 m and 1,0 m fixed to wall, with tray and four different colour pens.

(xix) Each bookcase shall be at least 0,9 m long, 0,9 m high with three shelves."

(c) Laboratories

Add the following:

"For the purposes of this Contract, commercial laboratory testing shall be used for acceptance control purposes."

(d) Car ports

Replace the last sentence with the following:

"The carports shall be provided with at least 80% shade netting."

B 1404 SERVICES

The following subclause shall be added to clause 1404 of the Specifications:

(e) First Aid

The Contractor shall provide a first aid kit at the site offices. No separate payment will be made and the Contractor shall allow for this in his tendered rates for accommodation for supervisory staff."

B 1406 MEASUREMENT AND PAYMENT

"Item	Unit
--------------	-------------

B14.01 Office and laboratory accommodation

Change description of items to the following:

(a)	Offices, 6.0m x 2.4m refitted container	Number
(b)	Boardroom, 12.0m x 2.4m refitted container	Number
(e)	Ablution units	
	(i) Site ablution unit with one male and one female toilet	Number

The unit of measurement shall be number of units delivered and installed on site and removed upon completion of the contract.

“Item” **Unit**

B14.03 **Offices and laboratory fittings, installations and equipment:**

(a) Items measured by number

Add the following new subitems:

(xix)	Steel plan cabinets.....	Number (No)
(xx)	Floodlights complete with poles and minimum 500W globes	Number (No)
(xxi)	Provision of approved amber strobe lights	Number (No)
(xxii)	Rechargeable 500 000 candlelight halogen lamps	
(xxiii)	Provision of approved lime coloured jackets	
(with lettering).....		Number (No)

Add the following new subitems:

(b) Prime-cost items and items paid for in a lump sum:

“Item” **Unit**

(i)	The provision of min 3G data service with Wi-Fi facility, including the cost of data and transmissions in connection with contract administration and data rental (min 2Gig per month)	Prime cost sum
(ii)	Handling costs and profit in respect of subitem B14.03(b)(i) above	Percentage (%)
(ix)	Provision of cell phones complete with car kits fitted to vehicles as directed, including all fees and the cost of phone calls in connection with the administration of the Contract	Prime cost sum
(x)	Handling costs and profit in respect of subitem B14.03(b)(ix) above.....	Percentage (%)

The tendered rates shall include full compensation for providing the services as specified. The tendered rate shall only be paid from the date that all services are operational and approved by the engineer.”

Add the following new items:

“Item” **Unit**

B 14.10 Provision of photostat, scan and printing facilities (up to A3 format)month

The tendered rates shall include full compensation for providing the services as specified. The tendered rate shall only be paid from the date that all services are installed and operational and approved by the engineer.”

“Item” **Unit**

B 14.11 Supply of two-way radios (hand held) number

- (a) Two-way hand-held radio VHF/AM Dittel FSG5 complete with charger, carry bag with strap and vehicle magnetic antenna including adapter cable (one to be used as specified in clause B1230 (b) - including cost of obtaining authority for use from ATNS)

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The unit of measurement shall be the number of units supplied. The tendered rates shall include full compensation for providing the radios as specified. The tendered rate shall be paid once the radios are operational and approved by the engineer.”

C3.6.5 SECTION 1500: ACCOMMODATION OF TRAFFIC

B1502 GENERAL REQUIREMENTS

Add the following to clause 1502:

This Contract is divided into limited occupation areas in order to allow for the airport to be fully operational during construction. All occupation areas will be over a short duration (e.g. for night shift works). The Contractor shall inform and obtain approval from ATNS and AM prior to closing any runway/RET/taxiway for construction. The requirements of Volume 5 and Clause B1230 shall be fully adhered to by the Contractor. The Contractor is also to note that escort services are to be provided by the contractor for vehicles entering the restricted area to areas where work is taking place (see Clause B1231).

Details of the envisaged Phasing of the work are contained in Volume 4 (Book of Drawings) and also in C3.5 of this document. If the Contractor wishes to deviate from these details in any way, the Contractor shall request approval for such deviation and if approved shall keep the Airport Manager (AM) and the Engineer fully informed of changes."

Add the following new sub-clauses:

(j) Night work

All plant used on site shall be equipped with suitable lights including flashing amber lights to enable the work to be properly performed and controlled at night. Night work will only commence if, according to the Engineer, the Contractor provides all equipment, personnel and stand-by reserves to execute the work at night as if in normal daytime hours.

Payment shall be made under item B15.15 for provision of the lighting for the whole working site in work areas as specified above.

The Contractor shall provide for artificial lighting to ensure the proper execution of the work in terms of the contract. The artificial lighting shall be subject to the Engineer's approval and shall consist of at least the following:

- (i) At least 3 floodlight towers per work area shall be provided when works are performed during the night shift. A work area is defined as an area of radius 15 m in which night work is being done. The Contractor shall provide adequate lighting at night as specified for every work area. The light in a work area shall be a minimum of 75 lux.
- (ii) The power systems shall comply with the Occupational Health and Safety Act No 6 of 1993 as amended, and the Standard Regulation for Wiring of Premises of the South African Institute of Electrical Engineers.

No additional payment will be made to the Contractor over and above payment for the Contractor's general obligations for providing and maintaining all extra personnel and equipment for executing night work. All cost for night work deemed to be included in the tendered rates and unless specific provision has been made there for in the Bill of Quantities.

Upon request by the Engineer or his representative, the Contractor shall make available a mobile flood light tower for use by the Engineer's staff. Payment for this request shall be made under item B15.16"

The Contractor shall timeously arrange with Airport Management to confirm night work hours granted and also consult the weather forecast to complete an activity to adhere to safety conditions working within 50 m from the runway edge.

B1517 MEASUREMENT AND

Item Unit

AMEND ITEM DESCRIPTION TO READ AS FOLLOWS:

B15.01 Accommodating traffic and maintaining temporary deviations on all work airside and
landside lump sum
B15.03 Temporary traffic-control facilities

REPLACE THE DESCRIPTION OF SUBITEMS (g) AND (h) WITH THE FOLLOWING:

"(g) Rectangular road signs, TGS-, TIN-, and TW-series (excluding TW-series delineators and barricades) number

(h) Delineators TW 401 or TW 402
 (250 mm x 1 000 mm sides):

(ii) Double sided number"

ADD THE FOLLOWING TO THE LAST PARAGRAPH:

"Payment for the provision of temporary traffic-control facilities shall be paid for once only, irrespective of the type of work to be executed or the number of times that the temporary traffic-control facilities have to be moved and re-used."

ADD THE FOLLOWING SUBITEMS:

"(n) Other traffic control measures ordered by the Engineer

(i) Provision of other traffic control measures prov sum
 (ii) Handling cost and profit in respect of subitem B 15.03(n)(i) percentage (%)

(p) Temporary taxiway closure crosses number

facilities Provisional Sum (Prov Sum) (i) Provision of other signs or

of subsubitem B15.03(o)(i) Handling costs and profit in respect
 percentage (%)"

"Item

Unit

B15.14 Provision of lighting on site for works areas during night work
or where instructed.....Lump Sum

The tendered sum shall include compensation for providing and maintaining lighting as specified and shall include for all units, required for all the operations being done during the same working period.

Payment shall be made monthly, pro rata to the contract time elapsed but shall not finally exceed the tendered sum, except when extension of time for completion is granted in terms of the general conditions of contract, when additional payment will be made pro rata to the initial contract period of the main portion of the works.

Payment for the moving and operation of the lighting equipment and other incidentals necessary for lighting the site shall be included in the tendered rates."

"Item	Unit
B15.18 Provision of escort services for all project vehicles	Lump Sum

Payment of the lump sum tendered will be made for the escort services required by AIRPORTS COMPANY SOUTH AFRICA (ACSA) to be provided by the Contractor. The tendered lump sum shall include full compensation for training requirements and Airside Vehicle Operators Permit (AVOP) compliance, providing all transport, safety equipment not otherwise specifically covered, labour and ancillaries required to perform an escort service for all construction vehicles from the security gate to the area where work is taking place.

Payment of the lump sum tendered will be made in three instalments.

- (1) The first instalment, 50% of the lump sum, will be made in the first payment certificate after the contractor has made a substantial start with construction in accordance with the approved programme.
- (2) The second instalment, 35% of the lump sum, will be paid when the value of the work reaches one half of the tendered amount, excluding contingencies and price adjustments
- (3) The third and final instalment, 15% of the lump sum, will be paid when the work has been completed and certificate of practical completion has been issued.

The tendered sum shall include full compensation for training requirements and AVOP compliance, providing all transport, safety equipment not otherwise specifically covered, labour and ancillaries required to perform an escort service for all construction vehicles from the security gate to the area where work is taking place."

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C3.6.6 SECTION 1600: OVERHAUL

B1601 SCOPE

Add the following to Clause 1601:

“No overhaul will be paid to the Contractor for transporting any materials whatsoever, whether obtained from commercial sources, designated borrow areas or any other source of material supplied by the Contractor.

The designated stockpile and spoil areas will be provided by the AM within the boundaries of East London Airport.”

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C3.6.7 SECTION 1700 CLEARING AND GRUBBING**B1702 DESCRIPTION OF WORK****(c) Conservation of Topsoil**

Add to the end of the 1st paragraph:

"The depth of the topsoil removal shall be reliant on the terrain, suitability of material and topsoil requirements of the work. Failure of the contractor to comply with the removal of topsoil, and/or failure of the contractor to protect the topsoil for later reuse shall result in the contractor having to provide topsoil at his cost."

B1703 EXECUTION OF THE WORK

Add the following new subclause:

"(f) Windrow of Topsoil and management of windrows

During the improvements of the shoulder areas strips for both runways, materials will be temporarily windrowed outside the work areas. No windrows shall be allowed within 37.5 m of the runway edge within 150m of any threshold. Windrow heights shall also be managed to ensure that they do not exceed Airports Company South Africa (ACSA) maximum obstacle height requirements"

B1704 MEASUREMENT AND PAYMENT

Amend the following pay items as follows:

"Item	Unit
B17.01 Clearing and grubbing:	
(a) Runway strips	hectare (ha)"

Add the following new pay items as follows:

"Item	Unit
B17.07 Clearing and grubbing densely wooded areas (not plantations)	hectare (ha)

The unit of measurement shall be the hectare of densely wooded area cleared and grubbed where instructed by the engineer.

The rates tendered shall include full compensation for all plant, equipment and labour for the clearing and grubbing where required, including the disposal of unsuitable material.

C3.6.8 SECTION 2100: DRAINS

B2101 SCOPE

AMEND THE FIRST PARAGRAPH TO READ:

"This section covers all work both rehabilitative and new work in connection with the excavation and construction of open drains, subsoil drainage, banks and dykes at the locations and to the sizes, shapes, grades and dimensions as shown on the Drawings or as directed by the Engineer, as well as the test flushing of subsoil drains."

B2104 SUBSOIL DRAINAGE

(a) Materials

- (iii) Synthetic-fibre filter fabric

ADD THE FOLLOWING:

"The synthetic-fibre filter fabric used shall be Kaymat Bidim A4 or an approved equivalent material."

- (vi) Galvanized woven wire mesh

REPLACE THE CONTENTS OF THIS SUBSUBCLAUSE WITH THE FOLLOWING:

"Galvanized woven wire mesh manufactured from 3,5 mm diameter wire, 250 mm x 250 mm in area with 12 mm x 12 mm maximum mesh size, and fitted with a frame made from 25 mm x 5 mm galvanized flat steel, shall be secured at the outlets of subsoil drainage systems with 4 x M6 galvanized bolts, in accordance with the details on the Drawings. The mesh shall be welded to the frame before the whole unit is galvanized."

(b) Construction of subsoil drainage system

ADD THE FOLLOWING SUBCLAUSE:

- "(v) Proving of pipes in subsoil drainage systems

On completion of the pipe laying and backfilling, the pipes shall be proved by pulling through a cylindrical cleaning brush followed by a wooden mandrill ± 400 mm long and having a diameter 5 mm less than the bore of the pipe. Proving of pipes shall not be paid for separately and the cost thereof shall be deemed to be included in the rate tendered for laying the pipe."

REPLACE THE HEADING OF CLAUSE 2106 WITH THE FOLLOWING:

"B2106 MANHOLES, OUTLET STRUCTURES, JUNCTION BOXES AND CLEANING EYES"

INSERT ", junction boxes" AFTER "manholes" IN THE FIRST LINE.

Item	Unit
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REPLACE ITEM 21.04 WITH THE FOLLOWING:

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

B21.04 **Impermeable backfilling to subsoil drainage systems**

- (a) Using the excavated material cubic metre (m³)
- (b) Using imported selected material cubic metre (m³)

The unit of measurement shall be the cubic metre of completed backfill, measured in place in the subsoil drainage systems and calculated in accordance with the authorized dimensions. For hot mix asphalt the unit of measurement shall be ton.

If excavations are carried out in excess of the dimensions authorized by the Engineer, the quantity of backfilling will nevertheless be based on authorized dimensions.

The tendered rates shall include full compensation for procuring, furnishing, transporting, placing and compacting the backfilling to 95% of modified AASHTO density. The tendered rate for subitem B21.04(b) shall, in addition, include full compensation for supplying selected material from approved sources provided by the Contractor, including all haul.

Item	Unit
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B21.12 **Concrete outlet structures, manhole boxes, junction boxes and cleaning eyes for subsoil drainage systems**

ADD THE FOLLOWING TO THE PAYMENT PARAGRAPH:

"The tendered rate shall also include full compensation for procuring, furnishing and cutting the galvanized woven wire mesh, inclusive of any waste, as well as installing the mesh in the pipe openings. Also included shall be all associated costs necessary to keep the wire mesh in the pipe openings clean for the duration of the Contract Period."

ADD THE FOLLOWING ITEMS:

Item	Unit
B21.25 Exposing existing subsoil/stormwater drains, inlets of junction boxes	..... m ³

The unit of measurement is the cubic metres of soil removed and re-compacted.

The tendered rate shall include full compensation for excavating, protecting existing service, backfilling and compacting materials to 93% of modified AASHTO density.

B21.26 **Connecting new sub-surface drainage system to existing stormwater/sub-surface drainage system**

..... number

The unit of measurement is the number of connections made, irrespective of the type of connection.

The tendered rate shall include full compensation for core drilling or breaking through existing manholes or junction boxes, installing the new pipe and re-filling around the pipe with appropriate epoxy cement.

C3.6.9 SECTION 3300: MASS EARTHWORKS

B3302 MATERIALS

b) Fill

Add the following under item (iv):

"The maximum swell at 100% Mod AASHTO compaction shall not be more than 2%."

B3303 CLASSIFICATION OF CUT AND BORROW EXCAVATION

Classification of cut and borrow excavation shall be revised as follows:

"a) Classes of excavation

(ii) Intermediate excavation

No distinction shall be made between soft and intermediate excavation, and all intermediate excavation shall be classified and measured as soft excavation."

B3305 TREATING THE ROADBED

a) Removing unsuitable material

Replace "or" in the eight line of the third paragraph with "and"

d) In situ treatment of roadbed

Add the following after the second paragraph:

"Shales and mudstone shall be treated as directed by the engineer."

Add the following new subclause

"(g) Improvement of the runway strips

Electrical conduits and any other instrumentations shall be identified and where required protected against possible damage by the contractor. The contractor shall take cognisance of Clause B1202 when working within the runway strips."

B3306 CUT AND BORROW

e) The temporary stockpiling of materials

Replace the contents of this subclause with the following:

"The contractor shall plan his activities in such a manner so that materials excavated from borrow areas and cuttings can be directly transported to and placed at the designated points.

The temporary stockpiling of material will not be paid for separately unless instructed by the engineer, and full compensation will be deemed to have been included in the rates tendered for the various payment items for work for which the stockpiled material is to be used."

B3312 MEASUREMENTS AND PAYMENT

General direction

(3) Work in restricted areas

DELETE THE CONTENTS OF THIS SUBCLAUSE AND REPLACE IT WITH THE FOLLOWING:

"No additional or extra over payment will be made for work in restricted or confined areas."

Amend the following pay items as follows:

"Item	Unit
B33.01 Cut and borrow to fill, including all haul:	
(a) Material in compacted layer thickness of 200 mm and less:	
(i) Compacted to 93% of modified AASTHO density from cut or stockpile (for filling of gravel roads).....cubic metre (m³)	
(b) Material in compacted layer thickness of 200 mm and less (for closing up night work areas adjacent operational runway/ taxiways and removed again)	

Compacted to 90 % of modified AASTHO density cubic metre (m³)"

Replace the fifth paragraph after the pay items with the following:

"The tendered rates shall include full compensation for procuring, furnishing and placing the material, including excavating as if in soft excavation, providing and placing of synthetic fibre filter fabric, the cutting of benches, for transporting the material for an unlimited free-haul distance, for preparing, processing, shaping, watering, mixing, and compacting the materials to the densities or in the manner specified herein and for removing and disposing of oversize material after processing, including transport for an unlimited free-haul distance."

C3.6.10 SECTION 3400: PAVEMENT LAYERS OF GRAVEL MATERIAL**B3401 SCOPE**

Add the following to this clause:

"This section covers the construction the shoulder drainage improvements on the main runway and works to RETs at East London Airport:

B3402 MATERIALS**a) General**

Add the following at the end of the second paragraph:

"For chemically stabilised layers the material shall conform to the requirements in table B3402/5.

Add the following after the second paragraph:

"Distinction shall be made between crushed and natural G4, G5 and G6 materials. Where the crushing and/or screening of these materials has been specified, the combined grading shall conform to the grading limits specified for G4 class material in Table B3402/1.

The same shall apply for all materials obtained from commercial sources."

Replace the grading section in Table 3402/1 with:

Table B3402/1

	Nominal aperture size of sieve (mm)	Percentage passing through sieve by mass			The percentage by mass passing the 2,00mm sieve shall not be less than 20% not more than 70%
		Crushed material Nominal max size		Uncrushed material	
		37,5 mm	28 mm		
Grading	53			100	
	50			95 - 100	
	37,5	100		85 – 100	
	28	86 - 95			
	20	73 - 86	87 - 96	61 - 91	
	14	61 - 76	73 - 86		
	5	37 - 54	43 - 61	31 - 66	
	2	23 – 40	27 – 45	20 – 50	
	0.425	11 – 24	13 – 27	10 – 30	
	0.075	4 - 12	5 - 12	5 - 15	

Note:

Refer to standard COLTO table for COLTO grading if required

Replace Table 3402/5 with:

"TABLE B3402/5: REQUIREMENTS FOR CHEMICALLY STABILISED LAYERS

Classification	C1	C2	C3	C4
Material before treatment	At least G2 quality	At least G3 quality	At least G5 quality	At least G6 quality
PI after treatment	Non-plastic	Non-plastic	6 max. *(1)	6 max. *(1)
UCS (MPa) *(2)	6 min.	4 min.	1,5 min	0,75 min.
ITS (kPa) *(3)	-	250 min	250 min.	200 min.
WDD (% loss)	5 max.	10 max.	20 max.	30 max.

Note:

- * (1) For materials derived from the basic crystalline rock group, the Plasticity Index after stabilisation shall be non-plastic.
- * (2) Unconfined Compressive Strength @ 100% Mod. AASHTO density
- * (3) Indirect tensile Strength @ 100% Mod. AASHTO density (Rapid Curing)
- * (4) Wet/Dry Durability according to Method B 8110"

b) Compaction requirements

Amend the compaction requirements as follows:

"MDD defined as maximum dry density according to SANS3001 Lower selected layer G6: 93% of

MDD

Upper selected layer G6: 95% of MDD Subbase C4: 97% of MDD

Cemented Base C2: of 98% MDD Gravel Base G3: 100% of MDD

Wearing course: 95% of MDD"

B3406 QUALITY OF MATERIALS AND WORKMANSHIP

Replace the second paragraph with the following:

"Test results and measurements will be assessed in accordance with the provisions of Section 8200. Lot sizes and minimum test frequencies are indicated on the construction drawings."

B3407 MEASUREMENTS AND PAYMENT

DELETE THE FIRST PARAGRAPH AND REPLACE IT WITH THE FOLLOWING:

"No additional or extra over payment will be made for work in restricted or confined areas."

ADD THE FOLLOWING ITEM:

Item	Unit
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B34.15 Pavement layers constructed from gravel obtained from commercial sources or approved sources provided by the Contractor, including all haul:

(b) Gravel selected layer compacted to 95 % of modified AASHTO density, using:

(i) Non-cemented material for a compacted layer thickness
of 150 mm cubic metre (m³)

(d) G3 for stabilised base layer (chemically stabilized material) compacted to:

(i) 100% of compacted AASHTO density for a compacted layer thickness
of 125, 150 and 200 mm cubic metre (m³)

(e) G6 for stabilised subbase layer (chemically stabilized material) compacted to:

(i) 95 % compacted AASHTO density for a compacted layer thickness
of 150 mm cubic metre (m³)

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The unit of measurement shall be the cubic metre of compacted pavement layer constructed with material obtained from commercial sources or approved sources provided by the Contractor. The quantity of which shall be calculated in accordance with the authorised dimensions of each separate completed layer by the method of average end areas from levelled cross-sections prepared from the ground line prior to the construction of new pavement layers, and the final specified or authorised layer cross-section superimposed at 20 m intervals along the centre line of the road.

The tendered rates shall include full compensation for the costs of negotiations and payments of royalties, for procuring, furnishing, placing, spreading, mixing imported and in situ material if required, breaking down, shaping, watering, preparing and compacting the material, for hauling the material over an unlimited free-haul distance from the source to the point of use, for protecting and maintaining the layer and for conducting control tests, all as specified. The tendered rates shall include full compensation for blading all oversize material off the road into windrows, for loading and transporting the material for an unlimited free-haul distance to approved dumping sites provided by the Contractor, and for off-loading and spreading the material, all as specified."

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C3.6.11 SECTION B3500: STABILIZATION

B3501 SCOPE

Add the following as a 3rd paragraph:

"The use of recyclers for cold in situ recycling purposes is also covered in this section, which includes cement, lime and emulsion of base layers consisting of gravel material as described in sections 3400."

B3502 MATERIALS

a) Chemical stabilizing agents

Add the following:

"The Engineer will specify to the Contractor the percentage and blend ratio of the specified stabilizing agents after tests on the Site during construction."

Delete sub-clauses (ii) Ordinary Portland cement and (iii) Portland blast-furnace cement and replace with the following:

"Cement shall comply with the relevant requirements of SANS 50197-1:2000. The use of strength classes greater than 32,5 shall not be permitted.

On this contract CEM II 32.5 N shall be used for stabilization purposes."

B3503 CHEMICAL STABILIZATION

a) Preparing the layer

Insert the following before the first paragraph:

"Moisture content tests shall not be undertaken more than one day in advance of in situ stabilization operations. Care shall be taken to ensure that samples are representative of the in-situ material. Checks shall be conducted when wet weather occurs between initial testing and work commencing on any section."

b) Applying the stabilizing agent

Replace the second sentence of the second paragraph with the following:

"Spreading shall only commence when the Engineer is satisfied that the correct quantity of stabilizing agent has been placed on the layer and has given permission that the stabilizing agent may be spread uniformly over the entire surface to be treated."

Add the following to this subclause:

"The minimum rate of application shall be 1.0% and the nominal rate is 1.5% by mass per mass of the specified stabilizing agent. The Engineer may order an increased rate of application. The spreading of stabilizing agent shall be done by placing sacks along the road and spreading by hand using rubber squeegees. Sacks which have become damaged or wet shall not be used and such sacks shall be replaced at the Contractor's cost."

B3505 BITUMINOUS STABILIZING

a) Preparing the material

Replace the 1st paragraph with the following:

"The material to be stabilised shall be prepared and placed as specified in section 3200. The moisture content during mixing-in of the stabilising agent shall be between 60-80% of optimum moisture content."

d) Applying the stabilising agent

Delete the entire sub-clause and replace with the following:

"The bitumen stabilising agent shall only be applied by means of an approved in situ recycling machine as specified in B3511. The recycling process as described in B3512 shall apply to the application and mixing-in of the stabilising agent."

f) Compaction

Delete the entire sub-clause and replace with the following:

The compaction process as described in B3512 shall apply."

g) Construction limitations

Replace this sub-clause with the following:

"No stabilization shall be done during windy conditions, wet weather or with falling air temperatures (7°C and dropping), or during rising air temperatures (when the air temperature is below 3°C).

Furthermore, the material temperature shall not be less than 10°C for bitumen emulsion and 15°C for foam bitumen.

The surface temperature of a compacted stabilized layer shall not be allowed to fall below 1°C during the first three (3) days after stabilization. The contractor shall be responsible for taking the necessary precautions to prevent the layer from freezing.

All stabilized layers damaged by rain, frost or by the formation of ice in the layer shall be removed and replaced by the contractor at his own expense.

The maximum time allowed to complete the stabilisation process shall be 12 hours.

The contractor shall make allowance for these requirements in his construction programme."

B3509 QUALITY OF MATERIALS AND WORKMANSHIP

Add the following after the second paragraph:

"The test results and measurements will be judged in accordance with the provisions of Section 8200. Bitumen stabilised layers shall be judged on the same criteria as chemically stabilised layers."

Add the following paragraphs:

"The Engineer shall be notified in good time to enable him to conduct tests himself.

Sample preparation and testing for cement stabilization testing shall be done by means of the Rapid Cure Method as described in clause B8110 while bitumen stabilisation sampling and testing shall be in accordance with the latest edition of the TG2.

The stabilized material sampled from the layer for the compaction of modified AASHTO briquettes, shall be prepared according to SANS 3001; GR54; i.e. discard material coarser than a 37,5 mm test sieve, and compacted according to SANS 3001; GR31.

Any delamination of the completed layer (biscuiting), identified by the hollow sound caused when a chain is dragged over the stabilized layer, shall be removed and repaired prior to the construction of subsequent layers. The repair method shall be approved by the Engineer. No payment will be made for repairs.

B3510 MEASUREMENT AND PAYMENT

Item	Unit
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B35.08 Bituminous stabilizing agent

Replace the 2nd payment paragraph with the following:

"The tendered rate for bituminous stabilising agents shall include full compensation for procuring and transporting the bituminous stabilising agent to site, for transfer into storage tanks, storage, heating and transfer into tankers for coupling to the recycling train, for all transport on site, for issuing the required assized weighbridge ticket showing the mass of bitumen contained in the tanker, for any re-heating required, for all wastage and for strict adherence to all safety measures required when handling warm or hot bitumen. The rate shall further include full compensation for diluting and applying the stabilising agent, irrespective of the prescribed rated of application. For foamed bitumen, the rate shall include for foaming the bitumen on the recycler, including the water and any other additive that may be required to achieve the minimum foaming characteristics and for injecting the foamed bitumen into the recycled material."

Item	Unit
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B35.14 Pre-pulverising material in the existing pavement..... cubic metre (m³)

The unit of measurement shall be the cubic metre of in situ measured pavement layer that is pre- pulverised in situ, as instructed by the engineer, regardless of the hardness or type of material encountered in the existing pavement. The quantity shall be calculated from measurements of the actual width and depth of the pre-pulverised section and shall not be increased to include any allowance for overlaps between adjacent cuts, nor for the number of cuts required to cover the width of pre-pulverising.

The tendered rate shall include full compensation for setting out the works, for pre-pulverising all types of material in the existing pavement structure, for controlling the depth of pre-pulverising, for the addition of water whilst pre-pulverising, for mixing, placing, shaping, cutting levels and compacting the material to a nominal density of 95% of the modified AASHTO density. It shall further include for all transport, labour, plant, equipment and incidentals required to pre-pulverise material as specified.

Item	Unit
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B35.15 Removal from site of surplus material cubic metre (m³)

The unit of measurement shall be the cubic metre of surplus material removed from site. The quantity shall be taken as 70% of the loose volume measured in trucks. Accurate load records shall be kept on site and submitted to the Engineer on a daily basis.

The tendered rate shall include full compensation for gathering the surplus material by windrowing or pushing it into heaps, for loading and transporting to a designated spoil or stockpile site including haul for a free haul distance of 1km, for offloading and either spreading the material or placing in neat stockpiles. It shall further include for all labour, plant, equipment and incidentals required to remove the material as specified.

Item	Unit
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B35.16 In situ recycling :

- (a) Chemically stabilised layer (specify layer type and compaction) using:

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(i) Non-cemented material (specify compacted layer
thickness)..... cubic metre (m³)
(b) Emulsion stabilised layer (specify layer type and compaction) using:
(i) Non-cemented material (specify compacted layer
thickness)..... cubic metre (m³)

The unit of measurement shall be the cubic metre of in situ recycled pavement layer, the quantity of which shall be calculated in accordance with the authorized dimensions of the completed layer.

The tendered rate shall include full compensation for setting out the works, preparing and providing the production plan, preparing the existing road surface where required, breaking up the existing pavement layer to the specified depth, breaking down and preparing the material utilising an in situ recycling machine, spreading and mixing the stabilizing agent but excluding the cost of supplying the stabilizing agent, any extra water required, placing and compacting (primary and secondary) the material, cutting final levels as well as the protection and maintenance of the layer, conducting process control and daily monitoring, measuring and demarcating the work where layers are reprocessed partly, protecting the adjacent pavement and its repair should it be damaged.

It shall further include for all labour, plant, equipment and incidentals required to in situ recycle the layer as specified.

The Engineer reserves to himself the right to vary the thickness of the layer to be stabilized by up to 20 mm, and the contract rate for this work shall not be amended by such change.

Material which is temporarily bladed to windrow for the removal of an underlying layer and then bladed back and compacted, will be classed as in situ reconstruction and paid for under this item. The temporary blading of the material to windrow will be paid for under item B35.15.

The tendered rate shall include full compensation for breaking down the material to comply with the specified grading requirements.

Item	Unit
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B35.17 Extra over item 35.16 for adding extra material:

(a) Selected layer (Specify material type and quality)	cubic metre (m ³)
(b) Subbase layer (Specify material type and quality)	cubic metre (m ³)
(c) Base layer (Specify material type and quality)	cubic metre (m ³)

The unit of measurement shall be a cubic metre of material added on the instruction of the Engineer, which quantity shall be taken as 70% of the loose volume measured in trucks, unless instructed by the Engineer that the quantity be determined by way of cross-sections.

The tendered rate shall include full compensation for procuring, adding and spreading the material to the existing pavement layer to be in situ recycled, and for haul over a free haul distance of 1,0 km except for material obtained from commercial sources where all haul will be deemed to be included. It shall further include for levelling and compacting the material to a nominal density of 95% of the modified AASHTO density.

Item	Unit
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B35.18 Finishing off of the stabilised layer

(a) Slushing with:	
(i) Water	square metre (m ²)

The unit of measurement for (a) (i) shall be the square metre of stabilised layer finished off through slushing with water. The quantity shall be calculated from measurements of the actual width and length of the stabilised layer.

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The tendered rate shall include full compensation for provision of all plant, equipment, materials, labour and all other incidentals to slush the layer as specified.

The payment description for payment item 45.04 shall apply mutates mutandis for this item."

Item	Unit
B35.19	
Extra over item B35.16 for additional compaction from 98% to	
100% of modified AASHTO density	cubic metre (m³)

The unit of measurement shall be the cubic metre of material compacted to the increased density. The quantity shall be determined in accordance with the authorised dimensions of the completed layer.

The tendered rate shall include full compensation for additional work and incidentals in respect of compacting the material to the increased density.

"B3511 PLANT AND EQUIPMENT FOR COLD IN SITU RECYCLING

All cold in situ recycling shall be done utilising purpose-built wheel-mounted in situ recycling machines. The following specifications are applicable to such machines. Where the contractor intends using any other type of machine to recycle (e.g. a modified track-mounted milling machine) he shall submit for the approval of the engineer a full motivation for using such a machine, including a detailed work plan describing the recycling / mixing process and subsequent compaction / levelling processes that will produce a layer that meets the specified end product requirements.

(a) In situ recycling machines

In situ recycling shall be carried out using a special-purpose recycling machine to break down and recover material from the prescribed horizon in the upper layers of the existing pavement, blended together with any imported material, stabilising agent(s), water and any other specified additives. The machine employed shall be capable of achieving the required grading and consistency of mix in a single pass.

In addition, the recycling machine shall meet the following requirements:

- (i) Be factory-built by a proprietary manufacturer having a demonstrable track record and manufacturing history in producing such equipment;
- (ii) If older than 10 years, the machine shall be certified by the manufacturer or manufacturer's authorised agent to confirm operational fitness-for-purpose dated not more than 3 months earlier than the date on which it commences work on the contract;
- (iii) Have a level-control system to maintain the cut depth within a tolerance of ± 10 millimetres of the required depth during continuous operation;
- (iv) The milling / mixing drum (the "cutter") shall have a minimum cut width of 2 metres with a facility to change the speed of rotation. The machine shall be capable of recycling to the maximum depth specified in a single pass;
- (v) The cutter shall rotate within an enclosed chamber (the mixing chamber) into which water and any liquid stabilising agents are injected under pressure at the specified application rate relative to the mass of material in the mixing chamber.
- (vi) The cutter shall be mounted on a swing arm that is separate from the housing of the mixing chamber, thereby allowing the volume of the mixing chamber to increase as the depth of cut increases.
- (vii) Have a liquid application system dedicated to adding water to the material in the mixing chamber;
- (viii) Where a bitumen stabilising agent is to be applied, a second separate liquid application system shall be fitted to the mixing chamber. Such system shall be appropriate for the addition of either bitumen emulsion or foamed bitumen;
- (ix) All liquid application systems shall be controlled by a micro-processor / flow meter combination that accurately regulates pump delivery (flow rate) with the speed of advance.
- (x) All liquid application systems shall include a dedicated spray bar that spans the full width of the mixing chamber. Each spray bar shall be equipped with multiple injection nozzles mounted equidistant along the length of the bar at a maximum interval of 200mm with the ability to close off selected nozzles, thereby allowing the width of application to be preset;

- (xi) Where two liquid application systems are used, the water application spray bar shall be mounted below the other spray bar (relative to the direction of rotation of the cutter) such that the recycled material encounters the water spray before the stabilising agent; and
- (xii) The recycler shall have sufficient power to recover and mix the existing pavement material together with all additives to produce a homogenously mixed material whilst pushing (or pulling) bulk supply tanker(s).
- (xiii) For foamed bitumen the liquid application system mounted on the recycler shall have the following additional features:
 - Each injection nozzle on the spray bar shall be fitted with an expansion chamber (the so-called "Mobil system") for foaming the bitumen;
 - Functioning gauges on the bitumen supply line for monitoring temperature and pressure;
 - The ability to demonstrate that all expansion chambers are free of blockages in both the water and bitumen feed lines;
 - A means of producing a representative sample of foamed bitumen at any stage during normal operations (i.e. a "test nozzle"); and
 - The micro-processor shall continuously monitor the actual bitumen consumption whilst working and provide a running total that allows immediate reconciliation with theoretical (calculated) consumption.

Before any recycling work commences, the contractor shall submit a specification sheet (obtained from the manufacturer) stating the capacity, pressure and temperature limits for each liquid application system that will be used to treat the recycled material.

The recycling machine that the contractor intends deploying shall be subject to the engineer's approval and he shall be entitled to reject a machine which, in his opinion, may not be capable of producing a consistent product when recycling to the specified depth(s).

(b) Plant for compacting and finishing the treated layer

The treated material exiting from the rear of the recycler shall be processed using suitable compaction equipment and graders to achieve a layer that meets the specified requirements. Sufficient plant and equipment shall be deployed to enable the treated material to be processed and finished off within the time limitations specified below.

(i) Primary compaction

Initial compaction shall be undertaken immediately behind the recycling machine using a vibrating single-drum padfoot roller selected in accordance with the following guidelines:

TABLE B3511/1 GUIDELINES FOR SELECTION OF PRIMARY ROLLERS

Minimum static mass of roller (tons)	Final layer thickness			
	< 150mm	150 – 200mm	200 – 250mm	> 250mm
	12	14	16	20
Minimum amplitude at frequency range	1.8mm @ 30 - 35Hz			

It will be advantageous if the roller is equipped with an integrated compactometer device to indicate and record the level of density that is achieved with each successive pass of the roller. These records can be used by the contractor for process control to indicate that the maximum density has been achieved.

(ii) Secondary compaction

After primary compaction and shaping of the layer a smooth drum vibrating roller with a static mass not less than 10 tons and not more than 14 tons shall be used to compact the upper portion of the layer.

(iii) Finishing of the layer

After the final level of the layer has been obtained a pneumatic-tyred roller (PTR) with a minimum static mass of 18 tons and mounted on at least seven (7) tyres shall be used to finish off the layer.

(c) Bulk tankers

Only tankers with a capacity exceeding ten thousand (10 000) litres shall be deployed to supply the recycling machine with water and/or liquid stabilising agents. Tankers containing a bitumen stabilising agent shall be fitted with appropriate tow hitches, one in front and one at the rear, thereby allowing the tanker to be pushed from behind by the recycling machine, and to push a water tanker in front. No leaking tanker will be permitted on the site.

Where a bituminous stabilising agent is added, each tanker shall be equipped with:

- (i) A thermometer reflecting the temperature of the contents in the bottom half of the tank; and
- (ii) A rear feed valve (minimum internal diameter of 75mm when fully opened) that is capable of draining the contents of the tank.

B3512 CONSTRUCTION OF LAYERS BY MEANS OF COLD IN SITU RECYCLING**(a) Requirements before recycling commences**

- (i) Stabilisation mix design procedure for cold in situ recycling

The following mix design procedure shall be followed as a minimum requirement for each stabilisation type:

This mix design shall be carried out on samples of neat materials extracted from the full depth of the recycling horizon. Bulk samples shall be extracted by means of the recycling machine proposed for the stabilisation work. For each material uniform section identified, two separate bulk samples shall be extracted from the recycling horizon and used in the stabilisation mix design process. The location at which such samples are taken shall be indicated by the engineer.

Stabilisation mix designs shall be undertaken by the engineer to determine:

- details for blending the recycled material with imported material (where necessary);
- application rates for stabilising agent(s);
- target strengths achieved from such application rates; and
- impact of material variations (sensitivity analysis)

Stabilisation mix designs shall be carried out in accordance with the latest edition of the following best practice guideline publications:

- Cementitious stabilisation: SAPEM, SANRAL M5 manual and TRH 13
- Bituminous stabilisation: SAPEM and TG2

- (ii) Setting out and control of the work for cold in situ recycling

Unless otherwise stated in the specifications, the contractor shall establish his own reference and level beacons for the setting-out and control of the works.

- (1) Layers constructed utilising existing levels

The existing horizontal alignment shall be retained and only minor modifications made to the vertical alignment, as described below.

The contractor shall establish a series of level control poles placed at a constant offset on both sides of the road at a maximum interval length indicated in clause B3405(a). At each level control location, the contractor shall record the existing road surface levels at the centre-line and at the outer limits of each lane and prepare a series of graphs (for sections not less than 2.0km in length) with the recorded levels

plotted at an exaggerated scale against the km distance. Final levels for the new stabilised layer shall be selected in accordance with a "best-fit" principle, taking into account the following:

- the required camber or super elevation details at each location;
- the minimum requirements governing changes in grade (longitudinal grade line);
- the thickness of the existing base layer; and
- minimising the amount of pre-work required (pre-treatment and/or importing new material) before recycling can commence.

At least two weeks before recycling work is scheduled to commence on any specific section, the contractor shall select the best-fit design levels and submit these proposals to the engineer (both as a schedule of longitudinal grade, cross-fall and final surface levels, as well as a drawing with the design lines superimposed on the existing levels) for approval or amendment.

The engineer will take control measurements to determine the accuracy and adequacy of the reference beacons / control poles, and may instruct the contractor to correct any faulty work and to take and provide such additional measurements and details as may be deemed necessary.

Survey work will not be measured and paid for separately and compensation for any work involved in staking, setting out, taking levels, determining the final surface elevations and transferring these design levels on to the level control poles (including the cost of all labour materials and reinstatement if required for any reason) will be deemed to be included in the rates for the relevant payment items for cold in situ recycling. No payment will be made for any inconvenience or delay caused by compliance with these requirements.

(2) Layers constructed utilising new levels

Layers shall be constructed according to new design levels as indicated on the drawings.

(iii) Production Plan

Prior to the start of a shift, the contractor shall prepare a production plan detailing his proposals for the forthcoming shift's work. As a minimum, this plan shall include a sketch showing:

- the overall layout of the length and width of road intended to be recycled during the day, broken into the number of parallel cuts required to achieve the specified width of treatment;
- the location of and overlap width (minimum 150mm) at each longitudinal joint between adjacent cuts, together with the location of the inner and outer wheel paths of each lane affected by recycling;
- the sequence and length of each cut to be recycled before starting on the adjacent or following cut; and
- an estimate of the time required for recycling each cut and for finishing off the work.

(iv) Preparing the surface

Before any recycling work commences, the surface of the existing road shall be prepared by:

- cleaning all vegetation, garbage and other foreign matter including road studs from the full road width, including any adjacent lanes or shoulders that are not to be recycled;
- removing any standing water;
- pre-milling to remove high-spots and/or pre-pulverising where ordered;
- providing a reference line to assist the operator to accurately steer the recycling machine, and
- record the location of all road marking features (e.g. extent of barrier lines) that will be obliterated by recycling.

(v) Surface shape and level requirements

Where surface defects are to be corrected and/or modifications made to the grade line, instructions will be issued detailing the new surface level requirements. These may be achieved prior to recycling by either pre-milling to remove in situ material, by pre-pulverising, pre-shaping and pre-compacting the pulverised material, or by importing material and accurately spreading on the existing road surface, as described below.

(vi) Pre-pulverising existing pavement material

Pre-pulverising shall only be undertaken on instruction from the engineer for the purpose of:

- breaking down excessively hard material;
- loosening the material across the road width so that it can be cross-mixed by grader;
- exposing the loosened (fluffed-up) material to the atmosphere to promote drying; or
- loosening the material in the existing pavement so that it can be loaded and removed from site.

The depth of pre-pulverising shall be carefully controlled throughout the operation to ensure that the cut

Unless the objective of pre-pulverising is to dry the material, a water tanker shall be coupled to the recycling machine and sufficient water added to allow the material to be compacted to a minimum density of 95% of the mod AASHTO density. Except where the material is to be cross-mixed, it shall be compacted immediately behind the recycler before using a grader to pre-shape the material in accordance with final level requirements.

(vii) Cross-mixing

Where cross-mixing is ordered, the material shall be bladed by grader or utilising other mixing equipment to achieve a uniform blend of material throughout the layer. The layer shall be compacted and shaped before being in situ recycled,

(ix) Addition of imported material

Where instructed to import material for blending and/or as make-up material for the purpose of shape, level or material grading correction, the prescribed material shall be imported and spread on the existing road surface prior to recycling. The method of placing and spreading the imported material shall be such as to achieve the required surface levels and will require the use of a paver, motor grader or other such plant. All imported material shall be pre-compacted to a minimum of 95% of the mod AASHTO density.

Nowhere shall the thickness of imported material exceed the recycling depth.

(b) The recycling processes

(i) Before starting

Prior to starting to recycle, the production planned for the day shall be approved by the engineer and the following checks carried out:

- All relevant temperatures shall be measured and recorded, including:
 - air temperature;
 - the material in the recycling horizon; and
 - the contents of all bulk supply tankers (including water).
- All plant and equipment are on site and the operators of the different machines are adequately trained and briefed on their particular tasks.
- The recycling machine has been prepared and set up for the first cut. Such preparations shall include:
 - checking that the mixing chamber is free of any material build-up that may affect the functioning of the application nozzles on all relevant spray bars;
 - the cutting tools have sufficient remaining life to complete the first cut without stopping;
 - all relevant liquid application systems are functioning, free of blockages and the in-line filters are clean. Where a bitumen stabilising agent is applied, a relevant check-sheet (similar to the example forms included in the Appendices of SAPEM and TG2) shall be diligently followed, signed off and submitted to the engineer;
 - the on-board computer has been correctly set up and the input data verified;
 - the spray bar is set up with the correct nozzles selected to achieve the required width of application;
- Bulk supply tanker(s) are coupled correctly to the recycling machine, all feed pipes are properly connected, bled of air and free of leaks. Where a bitumen stabilising agent is applied, the feed pipe shall only be connected immediately before work is about to start. Where the stabilising agent

is foamed bitumen, the outlet plumbing on the tanker shall be checked and any "cold plug" of bitumen removed before attaching the feed pipe.

- Where cement or lime is spread by hand on the road surface ahead of the recycling machine, the bag spacing shall be checked at random intervals and recorded.
- A clear guideline is in place for the recycling machine to follow and is correctly aligned relative to the road geometry.
- The integrated compactometer system on the primary roller properly functioning and has been set up to record the correct relevant data.

(ii) Recycling

The recycling machine shall be set up and operated to ensure that:

- The speed of advance is regulated (below the maximum allowable of 10m/min) to achieve;
 - adequate pulverisation of all bound materials in the existing pavement to produce a material that meets the grading requirements;
 - operating pressures and flow rates in all liquid application systems that remain within the limits prescribed by the manufacturer of the machine.
- The depth of recycling coincides with the line and level specified for the bottom horizon of the new stabilised layer. The bottom of cut horizon shall be checked at least once every 100m of cut using a suitable T-bar to dip from a stringline pulled between the relevant final level reference marks on the level control poles.
- The planned width of overlap along all longitudinal joints is maintained and the line of cut does not deviate laterally by more than 50mm from that required (measured from the operator's guideline that shall be positioned for each and every cut).
- The process is continuous with a minimum number of stops. Transverse joints that occur every time the recycling machine stops are properly treated to achieve continuity of stabilisation and moisture across the resulting joint.
- The application rate of liquid stabilising agent(s) and water is uniformly continuous across the required width of treatment, including all longitudinal joints.
- The temperature across the width of material exiting the mixing chamber shall be checked at least once every 100m using a digital thermometer with a laser beam target held no more than 100mm above the material. Where the temperature varies consistently by more than 3°C along a particular longitudinal strip ± 200 mm wide, the recycling machine shall be stopped and the relevant application nozzles on all spray bars that coincide with the offending strip shall be checked for blockages.
- The moisture content of the treated material is continuously monitored and the application of water adjusted to achieve a uniform moisture content as specified.
- The mixed material exiting from behind the recycling machine is struck off by the rear door of the mixing chamber with sufficient pressure applied to obtain a uniform surface that is free of valley lines, empty pockets and particle segregation.

The advance speed of the recycling machine and the speed of rotation of the recycling drum shall be set to obtain the required grading and sufficient mixing of all components (recycled material and additives) so that a homogeneous material is produced.

(c) Primary compaction

Recycling machines are configured such that their rear wheels run on top of the treated material towards the outer extremities of the cut. To prevent introducing a density differential across the width of cut, primary compaction shall be completed prior to any grader work commencing. If the treated material is pre-shaped by grader prior to being compacted, the work shall be summarily rejected.

A single-drum vibrating roller shall be deployed to compact the recycled material immediately behind the recycling machine. This roller shall travel forwards and backwards at a constant speed (maximum 3km/hr (50m/min)), remaining within the confines of the recycled cut. Recycled material covering the outer extremities of cut shall be moved at regular intervals (± 5 m) to expose the cut line, thereby allowing the operator to remain within the cut width.

Successive lengths of recycled / treated material shall be compacted (each approximately 50m in length).

Rolling shall continue on each section until the maximum achievable density has been reached. Where an integrated compactometer device is utilised normally rolling have to continue until the device indicates that no further density is being achieved over at least 80% of the length of the section (i.e. maximum achievable density has been reached). Should the device indicate a consistent loss of density at any point during primary compaction (as indicated over two successive recording passes), rolling on that section normally has to be terminated and the roller moved forward to start compacting the next section.

After each day's production, the contractor shall provide the engineer with his process control records of the densities achieved for primary compaction. Where a compactometer device was used an electronic copy of the data file containing detailed compaction records for the day's work shall be provided to the engineer. As a minimum, the records shall include the number of passes made on each section of every cut made by the recycling machine, the compaction achieved on every cut as well as the following data for each 2m interval along the length of each cut:

- the compactometer reading (where applicable);
- the amplitude of vibration; and
- the advance speed of the roller.

These records will constitute the contractor's Process Control for primary compaction.

A "roller pass" shall be defined as a single unidirectional pass made by the roller. Where the roller travels forwards and backwards over the same point, it would have made "2 passes".

A "recording pass" is a roller pass where the compactometer readings are stored (recorded) and used for comparison purposes. Recording passes are always in one direction of travel only. Recordings shall be made commencing with the first pass and every alternative subsequent pass that is made (i.e. 1, 3, 5, 7, etc.)

The primary compaction process shall follow at the same rate as the recycling operation. The contractor shall ensure that a sufficient number of rollers are available to achieve this.

(d) Final levels and secondary compaction

- (i) After completing the primary compaction on all adjacent cuts that make up the width of pavement that is recycled in one shift, the surface shall be pre-shaped and final levels cut before final compaction is applied. Pre-shaping shall address the lateral shift of material resulting from the surface inclination (cross-fall). The moisture in the layer shall be controlled during this process. No roller will be allowed onto the layer during the pre-shaping process to prevent the lamination phenomenon (biscuiting) occurring,

Secondary compaction shall then be applied using the smooth-drum vibrating roller operating in low amplitude vibration mode. The outer cut extremities shall be exposed as a guide for the roller operator to ensure that the compaction effort is directed only on to the recycled material (thereby preventing any "bridging across" from the unrecycled pavement).

(e) Finishing off of the layer

When the grader work and secondary compaction of the recycled base is complete, the surface will be sprayed with an appropriate amount of water or diluted emulsion and a pneumatic tired roller (PTR) applied. Such slushing shall be undertaken in short sections ($\pm 40 - 60\text{m}$) over the full width of the recycled layer. The PTR shall make sufficient passes and the surface must be sufficiently wet to generate a "mild" slush and close up voids in the surface together with any other grader-induced defects and achieve a tightly-knit surface finish. Rolling with the PTR must continue until no free water is visible and a uniform appearance, from a visual perspective, is achieved. Personnel equipped with squeegees shall be deployed to move the slush over areas showing signs of roughness and/or segregation. Squeegees shall be used to remove any surplus slush to the side of the road. Whilst still damp, the slush shall be broomed off the road using hand brooms. If a mechanical powered broom is used care shall be taken not to damage or loosen the surface. The final surface shall have a smooth, tightly-knit finish with no "biscuit" layers. Brooming of the surface is not required if the road is opened to traffic. The slushing

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process must be completed on the same day that stabilisation work is completed. The slushing process is dependent on the material properties and therefore the desired finish must be determined through trial sections.

Where the recycled material is treated with a bitumen stabilising agent and the intention is to open the finished layer to early trafficking, a diluted emulsion (15% residual bitumen) applied at between 0.5 and 0.75 litres/m² depending on the material type may be substituted for water in the slushing process. A water tanker fitted with an appropriate spraying system (or binder distributor) shall be used to spray a uniform amount of dilute emulsion on the surface before applying the PTR. Additional dilute emulsion may be applied where the first application failed to generate sufficient slush under the wheels of the PTR. Rolling with a PTR should continue until a uniform appearance, from a visual perspective, is achieved and should stop before when the emulsion shows signs of breaking and becoming sticky/tacky.

Once slushing is complete, the entire area may, on instruction of the engineer, receive a fog spray application using the same dilute emulsion (applied at a nominal rate of 0.75 litres/m²) and left to dry back before opening the road to traffic.

Dilute emulsion for slushing and fog spraying shall only be applied using an appropriate water tanker or binder distributor.

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C3.6.12 SECTION B3600: CRUSHED-STONE BASE

B3602 MATERIALS

a) Requirements for crushed aggregate

After the first sentence delete the remainder of the paragraph and replace with the following:

"The aggregate shall not contain more than 0,1% by mass of unwanted material such as wood, coal or similar organic material.

Aggregates containing mica, such as granite, gneiss, mica schist, pegmatite, sandstone shall not contain more than 2% by mass of free mica, especially muscovite, when assessed by visually separating the particles, or more than 4% by volume when assessed by means of microscopic slides. Aggregate containing easily detectable quantities (more than 1%) of olivine, serpentine and sulphide minerals such as pyrites and marcasite, must be considered with caution, and may warrant additional evaluation to the satisfaction of the engineer. Argillaceous rocks may only be used if specified in the project specifications, or with the engineer's written approval.

Soft or weathered particles shall be controlled by the Durability Mill Index values specified in B3602(e) Durability.

Provision has been made in clause B8108(b)(iii), calculation, for the determination and calculation of the Apparent Density for aggregates with a total water absorption greater than 1,5%, when total water absorption is determined according to SANS 3001-AG20 (replacing TMH1 method B14) and SANS 3001-AG21 (replacing TMH1 method B15)."

c) Grading requirements

Replace entire clause with the following:

"The target grading, after compaction, shall be as near as possible to the mean of the specified grading envelope listed in table B3602/1 and shall be continuous with no marked gaps or excessive quantities of any particular size. The mean grading of each lot (minimum of 4 but preferably 6 test points per lot) shall conform to the approved target grading plus or minus the tolerances specified in table B3602/4. However, no target grading plus tolerance can be set outside the original grading envelope in table B3602/1."

Table 3602/1

In table 3602/1 delete "85% of bulk relative density" and replace with: "88% of Apparent Relative Density".

Replace the grading section in Table 3602/1 with:

TABLE B3602/1

Grading	Nominal aperture size of sieve (mm)	Percentage passing through sieve by mass			
		Nominal max size			
		G1	G2	G3	
		37.5mm	37.5mm	37,5 mm	28 mm
	37,5	100	100	100	
	28	86 - 95	86 - 95	86 - 95	
	20	73 - 86	73 - 86	73 - 86	87 - 96
	14	61 - 76	61 - 76	61 - 76	73 - 86
	5	37 - 54	37 - 54	37 - 54	43 - 61
	2	23 - 40	23 - 40	23 - 40	27 - 45
	0,425	11 - 24	11 - 24	11 - 24	13 - 27
	0,075	6 - 10	6 - 10	6 - 10	5 - 12

Note: Refer to standard COLTO table for COLTO grading if required

Replace Table 3602/4 with:

TABLE B3602/4

Sieve size (mm)	Permissible deviations by mean values (% by mass)		Permissible deviations by individual values (% by mass)	
	Nominal maximum size (mm)			
	37,5	26,5	37,5	28
28	± 5		± 5	
20	± 5	± 5	± 7	± 7
14	± 5	± 5	± 7	± 7
5	± 5	± 5	± 7	± 7
2	± 4	± 4	± 5	± 5
0,425	± 3	± 3	± 5	± 5
0,075	± 2	± 2	± 3	± 3

Note:
Refer to standard COLTO table for COLTO grading if required

Add the following sub-clause:

“e) Durability

The durability property of aggregates derived from the basic crystalline group shall be assessed by means of the Ethylene Glycol Durability Index. When tested in accordance with the method prescribed in B 8105(g) the Durability Index shall not exceed four. In addition, the 10% FACT value obtained after soaking in ethylene glycol for four days shall not be less than 50% of that obtained on the unsoaked sample. Where any values are obtained that fall outside the above requirements, a detailed assessment of the quarry shall be undertaken together with a specialist mineralogical evaluation of both the coarse as well as fine fractions in order to assess the long-term durability properties of the material.

For Basic crystalline rocks, Arenaceous rocks, Argillaceous rocks and Diamictites the Durability Mill Index (DMI) shall be less than 125. For all other rock types, the Durability Mill Index (DMI) shall not be more than 420, subject to the % passing the 0,425mm sieve not increasing by more than 8 percentage points during the Durability Mill test.”

B3604 CONSTRUCTION

b) Compaction

Replace that last sentence of the first paragraph with:

"The density of the layer shall be tested at each third of the layer thickness."

c) Surfacing preparation of the base

Replace the final paragraph in subsubclause 3604(c)(i) with:

"Slushing of the base, is compulsory and shall be carried out within 48 hours after completion of the compaction. Even if the specified density is achieved without slushing or before completion of the slushing process, the full slushing process must still be completed."

Delete sub-sub-clause (ii) Multi-stage process (water or slurry rolling).

B3605 PROTECTION AND MAINTENANCE

Replace "moisture content of the layer" in the first paragraph with "moisture content of the upper 50mm of the layer."

Add the following to the end of the second sentence:

"as determined according to SANS 3001-GR30 (replacing TMH 1 method A7)."

B3607 QUALITY AND WORKMANSHIP

Delete "or 8300" in the second paragraph.

B3608 MEASUREMENT AND PAYMENT

Delete the first paragraph and replace it with the following:

"Note: No additional or extra over payment shall be made for work in restricted or confined areas."

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C3.6.13 SECTION 3800: BREAKING UP EXISTING PAVEMENT LAYERS

B3805 CONSTRUCTION

(a) General

Add the following:

“All bituminous layers will be removed to specified depths or levels.

No additional payment will be made for excavating any material in restricted areas or restricted width or tapered areas at end of section transverse joints or on cold joints (cut back areas as specified).”

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C3.6.14 SECTION 3900: PATCHING AND REPAIRING EDGE BREAKS

B3901 SCOPE

Replace the second paragraph with the following:

"Patching is defined as any work to existing pavement with the purpose of repairing local defects. The area of such local repairs may vary in size and shall be indicated by the engineer and/or shown on the drawings. Front end loaders and/or TLB's may not be used for breaking up and excavating the existing pavement, but may be used to load the excavated material into trucks. Payment for the excavation of patches shall be made in accordance with section 3900 regardless of the size of the patched area or of the method of excavation chosen by the contractor."

B3902 QUALITY OF MATERIALS AND WORKMANSHIP

Replace the second paragraph with the following:

"The test results and measurements will be judged in accordance with the provisions of Section 8200"

B3904 PATCHING

(c) **Excavating pavement material**

ADD THE FOLLOWING AFTER THE FIRST SENTENCE OF THE FIRST PARAGRAPH:

"Asphalt and seal layers shall be cut with approved sawing equipment."

(d) **Backfilling excavations**

ADD THE FOLLOWING:

"Excavations shall be backfilled with materials and to the specification as shown on the drawings"

B3907 MEASUREMENT AND PAYMENT

Item	Unit
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B39.02 for patching in:	Excavation in existing pavements
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REPLACE THE SECOND MEASUREMENT AND PAYMENT PARAGRAPH WITH THE FOLLOWING:

"The tendered rates shall include full compensation for demarcating the excavation, excavating, disposing of the excavated material at approved dumping sites provided by the Contractor, including all haul, complete as specified, and also for work in restricted areas."

ADD THE FOLLOWING PAY ITEM:

Item	Unit
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B39.06 Overhaul on excavated material carted to spoil, **m³-km**
including excavated asphalt, cemented subbase
and gravel material for haul in excess of the free-haul distance

Measurement and payment shall be made in accordance with the provisions of Section 1600, except that the free-haul distance will be >1.0km.

ADD THE FOLLOWING NEW CLAUSE:

"B3908 CONSTRUCTION TOLERANCES, FINISH REQUIREMENTS AND RESTRICTIONS

The final riding surface on any particular point on patches shall not deviate more than 3 mm from the bottom of a 3 m long straight edge.

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C3.6.15 SECTION 4100 : PRIME COAT

B4102 MATERIALS

(a) Priming material

ADD THE FOLLOWING:

"The prime coat shall be an inverted bitumen emulsion (MSP1) prime or as directed by the Engineer."

(b) Aggregate for blinding

ADD THE FOLLOWING:

"Blinding of the primed surface with aggregate shall only be permitted to facilitate vehicular access to adjoining properties."

B4103 EQUIPMENT

ADD THE FOLLOWING BEFORE THE FIRST PARAGRAPH:

"Before any storage, dilution or spraying operations commence the Contractor has to provide a safety and security and environmental protection method statement for approval of the Engineer. All personnel involved, including brooming, prime distributor, storage and production yard operators and labour shall wear the necessary protective clothing. Appropriate fire extinguishers and medical aid devices must be provided in working order. The Engineer reserves the right to stop the Contractor's operation or order any person from the Site who does not adhere to the above."

B4104 WEATHER AND OTHER LIMITATIONS

REPLACE SUBCLAUSE (g) WITH THE FOLLOWING:

"(g) When at any position within the layer the moisture content of a granular base layer is more than 50% of the optimum moisture content determined according to SANS 3001-GR30 (replacing TMH 1, Method A7). In the event of rain after priming, the base shall be allowed to dry out to meet the above moisture content requirement prior to surfacing."

B4106 APPLICATION OF THE PRIME COAT

ADD THE FOLLOWING TO SUBCLAUSE (c):

"The nominal application rate of the prime shall be 0.8 litre/m². Unless directed otherwise by the Engineer or indicated on the Drawings, the width of the primed surface shall be 150 mm wider than the edges of the surfacing on each side."

ADD THE FOLLOWING SUBCLAUSES:

"(j) Application in areas treated by reworking and construction of a new base shall be primed using a mechanical distributor complying with subclause 4103(a). The edges of the previously constructed or existing surfacing shall be adequately protected by approved means to ensure that an overlap of prime not exceeding 50 mm is sprayed onto the previously constructed or existing surfacing."

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(j) Where the prime coat is utilised as a curing membrane the prime shall be applied within 24 hours or as soon as the moisture content of the covering layer so permits."

B4108 TOLERANCES

ADD THE FOLLOWING TO THIS CLAUSE

"The actual spray rates measured at spraying temperature shall not deviate by more than 8.0% from that ordered by the engineer. The engineer may, at his discretion, conditionally accept application rates falling outside this tolerance at reduced payment in accordance with Table B4108/1.

TABLE B4108/1: PAYMENT REDUCTION FACTORS FOR CONDITIONALLY ACCEPTED PRIME COAT

Deviation specified spray rate at spraying temperature. (%)	Payment reduction factor of tendered rate.
±8,0	1.00
±9,0	0.97
±10,0	0.95
±11,0	0.90
±12,0	0.85
±13,0	0.80

Any deviation outside these limits shall not be paid for, however, the engineer shall have the right to instruct the contractor to make up any deficiency, or blind excessive prime without additional payment. Where so instructed, the material for blinding shall consist of approved, but shall consist of screened 5mm nominal single size aggregate. The use of crusher dust for blinding shall not be permitted. If under-spraying occurs, and it is accepted by the engineer, only the actual quantities applied shall be paid for."

B4109 TESTING

ADD THE FOLLOWING

"No payment shall be made if this condition is not adhered to. The Contractor shall provide, at his cost, representative samples of every batch of prime delivered onto site."

B4110 MEASUREMENT AND PAYMENT

ADD THE FOLLOWING BEFORE THE PAYMENT ITEMS:

"No additional or extra over payment will be made for work in restricted or confined areas."

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C3.6.16 SECTION 4200: ASPHALT BASE AND SURFACING

B4201 SCOPE

ADD THE FOLLOWING SUBCLAUSES:

"(e) Inlays to the milled pavement surface using continuously graded asphalt base and/or asphalt surfacing with/or without rolled-in pre-coated chippings.

(f) The establishment of asphalt paving and compaction equipment."

B4202 MATERIALS

(a) Bituminous binders

(i) Conventional binders

Add the following:

"The binders to be used shall be as follows:

(a) Continuously graded surfacing course: 50/70 penetration grade bitumen complying with the latest version of SANS 4001 BT1

ADD THE FOLLOWING SUBCLAUSES:

The Contractor shall submit the following to the Engineer for each batch of bitumen used on site:

- A copy of the SANS quality certificate, indicating the batch number and grade.
- A sample of the (base) bitumen.
- The source of the bitumen.

The Engineer will require the Contractor to submit samples of the bitumen to an approved accredited laboratory at random intervals to check compliance with the SANS 4001 criteria. The cost of these additional tests will be reimbursed through a prime cost item.

In addition to the above, the binder shall be recovered from hot box samples taken at the paver and tested for penetration and viscosity. These shall be compared with RTFOT testing on base bitumen, recovered directly from the asphalt plant. Two samples shall be tested per week (i.e. on base bitumen at plant and on the binder recovered from hot box samples) and the results submitted to the Engineer for evaluation purposes. All expenses related to these tests are deemed to be included in the Contractor's rates and prices and no payment will be certified under Section 4200 unless these results are submitted.

(b) Aggregates

ADD THE FOLLOWING PARAGRAPH AFTER THE INTRODUCTORY PARAGRAPH:

"Asphalt mixes shall be manufactured using different individual single size coarse aggregates fractions and crushed fine aggregates blended to conform to the specified grading requirements. The use of natural sands shall only be permitted if approved by the engineer and shall be limited to a maximum of 5% for continuously graded mixes. All aggregate in excess of 5mm shall consist of individual nominal single sized aggregate. The Contractor shall note that commercial suppliers may

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not be able to supply all the required single size aggregates, in which instance arrangements will have to be made for additional on-site screening. No additional payment shall be made for screening aggregate. The use of run of crusher type materials shall not be permitted."

Natural sand shall not be used unless all performance related tests proved to be acceptable."

(v) Absorption

ADD THE FOLLOWING:

"The bituminous binder absorption of the combined coarse and fine aggregate blend determined in accordance with TMH1 Method C4 (8) shall not exceed 0,5%."

(viii) Grading

ADD THE FOLLOWING:

"The grading limits for the combined aggregate grading for the asphalt surfacing shall be as specified in table 4202/7: Continuously graded - medium grade."

The Engineer may request a reconsideration of blends to achieve any grading within the relevant envelope in order to improve certain properties.

ADD THE FOLLOWING SUBCLAUSES AFTER SECTION (x):

"(xi) Deleterious materials

Presence of deleterious material in both coarse and fine aggregates to be used in the asphalt mixes shall be determined by a combination of the following tests (will vary from case to case):

- AASHTO test method T112: Clay lumps and friable particles in aggregates: Maximum weight percentage of material lost as a result of wet sieving shall not exceed 1% for coarse aggregates and 3% for fine aggregates.
- SABS Method 1243, 1994: Deleterious clay content of the fines in aggregate (methylene blue adsorption test): The methylene blue value of the materials shall be a maximum of 5%.

(xii) Durability of materials

It is recommended that the resistance of dolerite to weathering (or any other aggregates suspected of having rapid weathering properties) be determined by a combination of the following tests (will vary from case to case):

- Petrographic analysis of thin sections for the identification of minerals
- X-ray diffraction test to confirm the absence of smectite clays
- Slake durability tests in ethylene-glycol."

(xiii) Moisture content

The moisture content of aggregates, sampled from the cold feed belt, shall not exceed the following limits at the time that it is introduced into the mix:

-Coarse aggregate <2%

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-Fine aggregate

<4%.

(c) Fillers

REPLACE THE FIRST SENTENCE OF THE SECOND PARAGRAPH WITH THE FOLLOWING:

"An active filler of at least 1% and not more than 2% by volume shall be included in the design mix. The active filler for asphalt surfacing shall be hydrated lime. The omission of active filler shall not be permitted."

(h) General

ADD THE FOLLOWING AFTER THE SECOND PARAGRAPH:

"Aggregates used in the approved production mix shall only be taken from stockpiles that are sufficient in size for the production of a minimum of three day's work and shall have been tested for conformance and uniformity. The test results shall be presented to the Engineer."

B4203 COMPOSITION OF ASPHALT BASE AND SURFACING MIXTURES

ADD "or aggregate content" AFTER "or active filler content" IN THE THIRD LAST LINE OF THE FIRST PARAGRAPH.

REPLACE THE FIFTH PARAGRAPH WITH THE FOLLOWING:

"The design of the asphalt mixes shall be in accordance with the procedures given in Sabita Manual 35/TRH8. 2016. Design and use of asphalt in road pavements., and appropriate national and international research developments related to airfield pavements. Gyratory compaction tests and Hamburg Wheel Track Tests should be carried out during the mix design process on the plant mixes.

The testing requirements for the design of the continuously graded asphalt surfacing shall be as listed in table B4203/1.

ADD THE FOLLOWING:

The Contractor shall commence with a laboratory mix design (Level I) for the surfacing mix at various bitumen contents, demonstrating that the proposed mix complies with the specification. This shall be done within 14 calendar days from the commencement date.

Upon receiving the written approval for the laboratory mix design from the Engineer (feedback or approval to be given within 5 work days), he shall proceed with the plant mix design to prove that the plant is adequately calibrated and could produce mixes, consistent with the laboratory results, at three target bitumen ratios. The target bitumen ratios include the optimum (binder content at 4% voids, volumetric design at Level I), optimum-0.5%, and optimum+0.5%

This shall be done within at least 30 calendar days before the trial section is planned. The testing requirements for the plant mix design shall be as listed in table B4203/1, and should now also include the Laboratory test (A) as well as Gyratory testing and Hamburg Wheel Track Tests (B) for three bitumen contents.

Once the plant mix is approved in writing by the Engineer, the trial section surfacing operations can commence.

REPLACE TABLE 4203/1 WITH THE FOLLOWING TABLE:

TABLE B4203/1: TEST REQUIREMENTS FOR SURFACING

Property	Unit	Medium Grade, Continuously Graded
Base bitumen for tender		50/70 Pen
A. LABORATORY MIX DESIGN		
Marshall blows per face	number	75
Marshall stability at 60 °C	kN	9.5-18
Marshall flow	mm	2-4
Voids in mix	%	3-4.5
Stability/flow ratio	kN/mm	>2.5
Filler/bitumen ratio	-	1-1.5
Bitumen film thickness	µm	5.5-8
Dynamic creep modulus at 40 °C	MPa	>20
Indirect tensile strength at 25 °C	kPa	1000-1650
Air permeability @ 7% voids	cm ²	<1 x 10 ⁻⁸
Modified Lottman test%	%	>80
Voids in mineral aggregate (VMA)	%	Voids 5%>15 Voids 4%>14 Voids 3%>13
Voids filled with binder (VFB)	%	65-75
Permeability (EN 12697-19)	mm/s	0.1 - 4.0
B. PLANT MIX DESIGN (A+B)		
%G _{mm} at Superpave Gyratory compaction of N _{ini} = 8 gyrations	%	≤90.5*
Voids content at Superpave Gyratory compaction of N _{des} = 100 gyrations	%	4%*
%G _{mm} at Superpave Gyratory compaction of N _{max} = 300 gyrations	%	<98*
Hamburg Wheel Track Test (AASHTO: T 324)		
Minimum number of passes to 6mm rut (PG58)	Passes	>16 000
Minimum number of passes to 6mm rut (PG58)	Passes	> 10 000

* The tests and properties listed under Section B shall be conducted and reported by the Contractor as part of the design process and submission of plant mix test results. Target values are established in accordance with FAA Engineering Brief 59A, 2006.

All costs for test work as described above, including Permeability, Gyratory and Hamburg Wheel Track testing, shall be included in the rates and prices and no additional compensation shall be paid the testing and trial work described above.

Replace Table 4202/7 with B4202/7Part 2

TABLE B4202/7 PART 2: GRADING LIMITS FOR COMBINED AGGREGATE FOR ASPHALT SURFACING

		Continuously graded			Semi-open graded
		Coarse	Medium	Fine	
PERCENTAGE THROUGH SIEVE BY MASS	28	100			100
	20	88 – 100			75 – 100
	14	73 – 86	100		53 – 85
	10	64 – 77	85 – 100	100	20 – 41
	5	44 – 62	56 – 77	66 – 89	7 – 20
	2	27 – 45	33 – 48	42 – 59	4 – 13
	1	21 – 35	25 – 40	31 – 51	3 – 10
	0,600	16 – 28	18 – 32	24 – 40	3 – 8
	0,300	12 – 20	11 – 23	16 – 28	2 – 6
	0,150	8 – 15	7 – 16	10 – 20	1 – 4
	0,075	4 – 10	4 – 10	4 – 12	
NOMINAL PROPORTIONS BY MASS	AGGREGATE	93,5%	93,5%	93,0%	90,5%
	BITUMEN (GRADE ACCORDING TO PROJECT SPECIFICATIONS)	5,5%	5,5%	6,0%	8,5%
	ACTIVE FILLER	1,0%	1,0%	1,0%	1,0%

Notes:

1. For recycled asphalt the nominal mix ratios of recovered asphalt, new aggregate, new bituminous binders, and active mineral filler to be used for tender purposes, shall be as specified in Table B4202/16
2. Refer to standard COLTO table for COLTO grading if required

B4204 PLANT AND EQUIPMENT**(a) General****ADD THE FOLLOWING:**

"Before any storage, mixing or spreading operations commence, the Contractor shall provide a safety and security and an environmental protection method statement for approval by the Engineer.

The Contractor shall ensure that his operations are carried out in a safe and secure manner. All personnel involved, including bitumen distributor, batching plant and storage yard operators and labourers must wear the necessary protective clothing. No person without the necessary protection clothing will be allowed on the Site. Appropriate fire extinguishing equipment and medical aid devices must be provided in good working order. The Engineer reserves the right to stop the Contractor's operation should any of the above not be in order.

The Contractor shall ensure that his operations pose the minimum risk to the environment. Any accidental spillage of bituminous materials has to be cleared up and disposed of before any operations can continue. The Contractor will be

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required to submit a written report to the Engineer in which he details precautionary measures instated to prevent future accidents.

"In all cases of night work and/or other limited occupation work sections, the contractor shall ensure that a minimum of 50 tons of asphalt is available in hot bins at the plant before excavation/removal of existing surfacing commences. The contractor is to ensure that the production shall be such that should there be a problem at the plant that sufficient asphalt is stored in hot bins to backfill the full milled areas. In cases of night time work or other limited access occupation areas requiring opening to traffic at the end of the occupation period, binned asphalt or asphalt already on site shall be equivalent / or greater than the quantity of material required to backfill any milled work."

(b) Mixing plant

- (i) Conventional binders

ADD THE FOLLOWING AFTER THE THIRD PARAGRAPH:

"The manufacturer's rated capacity of the mixing plant shall be adequate to meet production requirements for the work. The rate of production shall not exceed manufacturer's rated capacity of the plant."

ADD THE FOLLOWING AFTER THE SEVENTH PARAGRAPH:

"If the material recovered from the dust collecting equipment is to be fed into the mixer it shall first be weighed by means of a suitable weighing device. No material finer than 0,005 mm may be fed back into the mixer without the written permission of the Engineer."

(c) Spreading equipment

- (i) Paver

ADD THE FOLLOWING:

"Each paver must be capable to be operated at forward speeds consistent with satisfactory placement and compaction of the relevant mixture. The paver must also be capable of screeding a smooth asphalt finish of uniform texture."

(f) Vehicles

ADD THE FOLLOWING:

"Plant and vehicles used at the laying site shall be free from oil, fuel, and hydraulic fluid leaks. Any item of plant or vehicle showing signs of these leaks shall immediately be removed from the site."

B4205 GENERAL LIMITATIONS AND REQUIREMENTS AND THE STORAGE OF MIXED MATERIAL

(c) Surface requirements

- (iii) Tack coat

ADD THE FOLLOWING NEW PARAGRAPH:

"Hand spraying shall only be permitted on areas approved by the Engineer. The binder distributor shall comply with the requirements of clause 4103 and shall be capable to applying the binder evenly over the full area. The specified tack coat shall be uniformly applied to all transverse and longitudinal joint faces by hand utilising a paint brush."

ADD THE FOLLOWING SUBCLAUSES:

"(e) Layer thicknesses

Minimum paving thickness of continuously graded asphalt surfacing shall be 30 mm. The maximum paving thickness of the asphalt surfacing shall be 50 mm, above which paving must be carried out in two layers.

(f) Removal of grass etc.

Prior to spraying the tack coat, all grass, weeds, etc, encroaching onto the road surface or growing between the edge of the existing surfacing and kerbs, channels, etc, shall be removed.

(g) Construction requirements

- (i) Immediately before placing the asphalt mixture, the surface shall be cleaned of loose or deleterious material by brooming or other approved means.
- (ii) Wherever the existing surface is excessively distorted, milling and replacing with a continuously graded, medium grade asphalt shall be done to restore proper cross-section prior to constructing the new overlay."

B4206

PRODUCING AND TRANSPORTING THE MIXTURE

(b) Production of the mixture

- (ii) Using drum-type mixer plants:

ADD THE FOLLOWING:

"The Contractor shall ensure that sufficient cold-feed bins are installed to accommodate each individual aggregate fraction, including the filler. Pre- blending of aggregate fractions shall not be permitted."

(c) Transporting the mixture

ADD THE FOLLOWING PARAGRAPH:

"Special precautions shall be taken by the Contractor to ensure that the temperature of the total mass of asphalt does not decrease by more than 10 °C from point of despatch to the point where it is to be paved. The use of the thermal blankets is obligatory."

ADD THE FOLLOWING SUBCLAUSE:

"(f) Approval of asphalt mixes

Before any asphalt is placed on the road, the Engineer shall approve the mix design and asphalt produced from the design. The approval process shall be as follows:

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(i) Laboratory mix design

The Contractor shall prepare and submit a laboratory design mix together with test results at four different bitumen contents on the prescribed form D3 of TMH 10, including all tests stated in TABLE B4203/1. All the expenses in preparing and submitting the laboratory design mix shall be to the contractor's cost.

The proposed design, as well as samples of all aggregates and bitumen intended for use, shall be submitted to the Engineer for check testing within 14 calendar days from the commencement date.

(ii) Plant design

After approval is obtained for the laboratory design mix, plant mixes of approximately 5 to 10 ton, at three varying binder contents, shall be produced. The purpose of the plant mix is for the Contractor to prove that the laboratory design mix can be reproduced successfully and that the plant is accurately calibrated. The Contractor shall repeat all testing done for the laboratory design (TABLE B4203/1) on plant samples, which now must also include Gyratory and Hamburg Wheel Track tests. These mixes shall not be placed on the road. All the expenses in preparing and submitting the plant design mix shall be to the contractor's cost. Results shall be presented in form D3 OF TMH 10 and complete Gyratory compaction and Hamburg Wheel Track test curves shall be presented. This shall be done within at least 30 calendar days before the trial section is planned

(iii) Trial section

After the plant mix has been approved, permission shall be given for laying a trial section at the approved binder content in accordance with the requirements of Section 4211 of the Standard Specifications (see also B4211).

Mass production of asphalt shall only commence after approval of the trial section. Trial results shall be evaluated within a maximum of seven calendar days of the Contractor submitting all test results obtained during the trial.

The Engineer may instruct the Contractor at any time to halt his production process in order to review the whole, or part, of the approved design mix should there be a change of aggregate properties, the specified asphalt requirements are not being met or a consistent asphalt mixture not be obtained."

(iv) Production

The Engineer may instruct the contractor at any time to halt his production process in order to review the whole, or part, of the approved design mix should there be a change of aggregate properties, the specified asphalt requirements are not being met or a consistent asphalt mixture not be produced."

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B4207 SPREADING THE MIXTURE

Add the following to subclause (a):

"The following paving restrictions will strictly apply:

- No paver stops will be allowed for reversing supply trucks.
- Continuous paving operation is a requirement. Paver speed to be regulated to prevent supply related stops. Paving operations may only start if sufficient asphalt supply trucks are available to ensure a continuous paving operation.
- Levelling skid-beams (9 m length at least with free wire between ends) or wire guide system to be used on both sides – no joint matchers except if agreed or instructed by the Engineer.
- Automatic auger feed control, which can keep the asphalt mount in-front of the screed constant, are required.
- No pneumatic rolling as breakdown rolling on the final surfacing layer.
- Handwork shall not be allowed.
- No fat spots or loose stones.
- No water ponding.

In the case of non-appliance herewith the Engineer's personnel will stop the paving operations and sections done in non-compliance can be rejected after assessment by the Engineer."

B4208 JOINTS

DELETE THIS CLAUSE AND REPLACE WITH THE FOLLOWING:

The contractor shall submit his jointing plan at least seven days before surfacing operations are to commence. The jointing plan shall indicate the type and location of joints of subsequent layers. The general jointing requirements are described below.

(a) General requirements

Joints shall be at right angles or parallel to the centreline. Rollers shall not pass over unprotected ends of freshly laid mixtures except when necessary to form a transverse joint. All joints shall be neat and have the same texture as the asphalt surface course. Joints shall be marked out by chalk lines prior to cutting and cutting shall take place by means of cutting wheel. Before a new layer is placed next to an existing layer, the cut edge and bottom surface of the existing layer shall be painted with a thin coat of bitumen emulsion of the same type used for the tack coat as shown on the drawings. Excess binder to the top and base of the joints, streakiness and blobs shall be avoided. Heating of joints shall not be permitted.

(b) Longitudinal joints

- (i) Longitudinal joints in asphalt layers shall be constructed whenever the temperature of the surface mat has decreased below 100°C. Joints shall be placed in such a position that they are at least 600mm horizontally away from any longitudinal joints in the underlying material but the joint on the top shall be located on the centreline of a crowned surface. The longitudinal lane joints shall be vertical in straight lines which are continuous for the full length of the pavement, or on smooth curves along bends.
- (ii) The exposed vertical edges of longitudinal lane joints shall be carefully cut-back and trimmed to firm material in the compacted lane, or for a minimum of one and a half times the layer thickness, whichever is the greater and all material arising from this operation shall be removed before the cut edge is painted.

- (iii) Cutting back and trimming will not be required when two or more spreading units operate in echelon in close proximity, permitting adjacent lanes to be continuously compacted before the material around the joint between the lanes falls below the compaction temperature specified in (i).

(c) Transverse joints

- (i) Transverse joints are required at the end of a day's work and following any interruption in laying which prevents continuity of rolling at, or below the specified minimum temperature (i).
- (ii) The exposed vertical edges of the transverse joints shall be cut back for at least 300mm and trimmed. All material arising from the operation shall be removed from the pavement and the underlying surface cleaned and painted with bitumen as specified in (a). Joints shall be placed in such a position that they are at least 600mm horizontally away from any underlying joints
- (iii) On completion, the joints shall present the same texture as the remainder of and the accuracy of the surface across the joints shall meet the criteria specified in (d).

(d) Surface accuracy of joints

- (i) Notwithstanding the requirements of Section B4213, surface accuracy on joints shall be measured as the gap between the bottom of a 3m long test straightedge and the surface of the pavement when the straight edge is placed unsupported on the surface. The surface accuracy shall not exceed 3mm for surface courses in any direction, other than across the crown of a camber or across a drainage channel.
- (ii) Twenty surface accuracy tests shall be made for every 500 ton laid. The location of all tests shall be selected by the Engineer and shall be carried out in his presence. All areas not complying with this requirement shall be marked with white paint.
- (iii) Any non-complying area shall be removed for the full width of the lane and replaced by the Contractor, at his own expense, with material and workmanship that shall satisfy the acceptance criteria.

(e) Tests on joints

- (i) Core samples shall be extracted adjacent longitudinal as part of normal quality control operations, and when directed by the Engineer in writing, across transverse joints.
- (ii) Cores adjacent to longitudinal lane joints shall be situated at a distance not exceeding 50mm or nearer than 25mm from the joint. For transverse joints, cores shall be extracted on the joint.
- (iii) Cores on joints shall be taken at intervals of not less than 150m and test results shall be assessed together with cores taken from the mat, as one quality control lot.

All the construction joints should be ready sealed with a modified cold asphalt emulsion after rolling and compaction to ensure non-permeability of the joint (refer to Item 42.14 and 42.15 for quantities).

B4210 COMPACTION

REPLACE THE SIXTH PARAGRAPH WITH THE FOLLOWING:

"The sequence of rollers used in compaction is at the discretion of the Contractor provided that the completed pavement shall have a density as measured on the

recovered core of the greater of 93% or 97%, minus the percentage voids in the approved production mix, of the theoretical maximum density, determined as described in TMH1 method C4 or the SANS equivalent."

ADD THE FOLLOWING:

"Rollers must move at a uniform speed not exceeding 5 km/h, with the driving wheel nearest the paver. Rolling must continue until all roller marks have been eliminated and the specified minimum density obtained, but not after the mat has cooled to 90 °C or below. The Contractor shall monitor density during the compaction process by means of nuclear density gauges to ensure that at least the minimum required compaction is being achieved.

To prevent adhesion of the mixture to the rollers, it will be necessary to keep the wheels properly moistened with water mixed with very small quantities of detergent or other approved material.

Immediately after the mixture has been spread and struck off, it is to be thoroughly and uniformly compacted by rolling.

Once sufficient in-place density has been achieved, rolling operations shall be stopped immediately as over-rolling may cause migration of bitumen and filler to the compacted pavement surface.

Traffic must not be allowed on the newly compacted surface before the mat has cooled to 60 °C or lower."

B4211 LAYING TRIAL SECTIONS

ADD THE FOLLOWING:

"For conventional asphalt, a trial section of about 60 m x 2 lanes (at least 3.5m wide) shall be laid based on the results of the laboratory design mix. A cold longitudinal joint of 60m shall thus be formed as part of the trial (including cutting-back operation). Volumetric properties, indirect tensile strength on briquettes shall all be checked against the criteria set in tables B4203/2 and B4203/3. Gyratory compaction tests should be carried out on the samples obtained from the trial sections. MMLS testing and Marvil permeability tests shall commence as soon as it is confirmed that density specifications have been achieved. MMLS testing is not required on the conventional binder section (i.e. service road area).

B4213 CONSTRUCTION TOLERANCES AND FINISH REQUIREMENTS

(a) Construction tolerances

(v) Surface regularity

REPLACE THE SUBCLAUSE WITH THE FOLLOWING:

"For all hot mix asphalt overlaid areas, the surface regularity, in addition to the specified requirements, shall be determined with a high speed profilometer (HSP), capable of producing a class 1 vertical measurement and class 3 longitudinal sampling distance as defined in ASTM standard E950-94, with a valid validation certificate. Record the longitudinal profile in both wheel tracks, 1.7 m apart for each paved lane (shoulders may be omitted from the assessment if approved by the Engineer). Then, from the data, determine the average IRI for the left and right wheel track for each 100 m section for each lane paved in one width. The first and last 50m of the runway/taxiway intersection will not be

assessed for riding quality. The IRI shall be judged in terms of the payment adjustment factors in Table B4213/2.

TABLE B4213/2: RIDING QUALITY FOR HOT MIX OVERLAY PAYMENT ADJUSTMENT FACTOR

Riding quality	Payment adjustment factor
100 m IRI values (mm / m)	Overlay on existing milled surface
< 1,20	1,0
1,21 – 1,30	1,0
1,31 – 1,40	1,0
1,41 – 1,50	0,98
1,51 – 1,60	0,97
1,61 – 1,70	0,96
1,71 – 1,80	0,94
1,81 – 1,90	0,92
1,91 – 2,0	0,90
> 2,0	Not acceptable

Sections that are found to be unacceptable in terms of regularity shall either be replaced or remedial measures implemented that will provide the required riding quality. A method statement describing these measures shall be approved by the employer before implementation. Skimming of the areas with a milling machine shall not be allowed. All corrective work shall be done at the contractor's expense. After completion of the corrective work the specific 100 m section shall be re- evaluated as described above.

Any adjustment to the payment of asphalt surfacing shall be done by multiplying the payment adjustment factor derived as above with the full payment of the relevant asphalt pay item plus tack coat and other payable incidentals. The payment adjustment factor shall apply to the full layer width paved in one operation for that specific 100 m section.

Riding quality tests using the HSP shall be paid for under pay item 83.01.

Any acceptance of asphalt quality control will not be deemed to include for this clause until such testing has been complete and finalised with the Engineer. Acceptance at partial payment, based on obtained riding quality between 1,4 and 2,0, is at the discretion of the Engineer (based on adherence to B4207 and all other applicable COLTO workmanship specifications). In areas where the Engineer can certify adherence to the criteria, in the absence of available IRI test results, he may do so with permission of both the Employer and Contractor.

The rolling straight edge test in the Standard Specifications will not be applicable except on the transverse construction / stop joints of all paved sections. The maximum irregularity measure with the wheels of the standard apparatus removed (only outer wheels at 3m spacing in place) shall be + or - 3mm. Joints that do not satisfy these criteria shall be milled and reconstructed over a minimum "10m in length" section."

The Contractor shall arrange for the IRI testing of all sections by a Laboratory approved by the Engineer. It is recommended that frequent measurements be made during the initial set up of the paver and over the progress of the project. However, as an absolute minimum, measurements shall be provided to the Engineer after 10%, 50% and 100% of the surfacing area has been completed.

The contractor is to supply surveyed levels of each layer (including the milled interface and the original surface) to the engineer at a frequency of at least five positions along the width of the paved layer and at 20m interval. These co-ordinated positions shall then be used for all subsequent surveyed layers."

(c) Gradings

Replace Table 4213/1 with:

TABLE B4213/1: AGGREGATE GRADING TOLERANCES

Size of aggregate passing Sieve size (mm)	Permissible deviation from target grading (%)
28	± 5
20	± 5
14	± 5
10	± 5
7	± 5
5	± 4
2	± 4
1	± 4
0,600	± 4
0,300	± 3
0,150	± 2
0,075	± 1*

* When statistical methods are applied the permissible deviation for the 0,075 fraction is ± 2%.

(e) Voids

ADD THE FOLLOWING:

"The void content shall not deviate from the approved production mix void content by more than 1%."

(f) Construction tolerances for overlays

ADD THE FOLLOWING TO THE FIFTH PARAGRAPH:

"The nominal thickness of the asphalt scratch coat shall be as indicated on the drawings."

ADD THE FOLLOWING SUBCLAUSE:

"(g) Air-void tolerance

The actual air voids may not deviate by more than 1 percentage point from the air voids in the approved production mixture."

B4214 QUALITY OF MATERIALS AND WORKMANSHIP

(b) Coring of asphalt layers

ADD THE FOLLOWING:

"A suitable coring machine shall be available on a daily basis when asphalt paving is taking place.
Cores shall only be drilled and extracted when the road

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temperature is 20° C or less. Core holes shall be filled with hot mix asphalt and compacted within 24 hours of the core's being taken. Coring shall be carried out within 48 hours after the section has been completed and supplied to the engineer for acceptance control testing. The process control test results on cores shall be submitted to the engineer within 24 hours after coring."

(c) Routine inspection and tests

REPLACE THE SECOND PARAGRAPH WITH THE FOLLOWING:

"Test results and measurements will be assessed in accordance with the provisions of Section 8200."

ADD THE FOLLOWING:

"The Contractor shall keep accurate records of

- (i) the position where every truckload of asphalt is paved (distance, lane, width, time and date)
- (ii) the temperatures of the asphalt in the trucks both at the mixing plant and at the paving equipment immediately prior to discharging the load
- (iii) the truck and weigh bill number from which control samples are taken."

ADD THE FOLLOWING SUBCLAUSE:

"(d) Special tests

- (i) n-Heptane-Xylene Equivalent (Spot test) (AASHTO-T102)

If the Engineer considers that the bitumen or asphalt mix has been overheated, he may order that the bitumen, or the bitumen recovered from the asphalt, be subjected to the Spot Test.

Recovery of binder for use in the spot test shall be carried out according to an approved method.

Any sample showing an n-Heptane-Xylene equivalent in excess of 36, or is in excess of the manufacturers test result on the new stock, shall be considered to have been overheated and shall be deemed to be rejected until proven to be acceptable based on further evaluation."

B4215 MEASUREMENT AND PAYMENT

REPLACE THE FIRST PARAGRAPH WITH THE FOLLOWING:

"Items 42.13, 42.14 and 42.16 are applicable solely to work that has to be executed in a restricted area of which the width is less than 1,8 m or the length is less than 150,0 m."

Item	Unit
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B42.08	100 mm cores in asphalt paving..... number
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AMEND THE FIRST SENTENCE BY ADDING THE FOLLOWING AFTER THE WORD "drilled": "irrespective of depth of core."

C3.6.18 SECTION 5700: ROAD MARKINGS**B5706 SETTING OUT THE ROAD MARKINGS**

Add the following:

"Where road markings are to be replaced after milling/overlay, it is essential that all existing road markings be accurately referenced before commencement of milling or other operations which will obliterate the existing road markings. The position of the new road markings shall be reassessed on site by the Engineer before the Contractor commences with the road marking. No separate payment will be made for referencing the existing road markings and full compensation shall be included in the rate tendered for item B57.06. For safety purposes, pre-marking of the final road markings shall be done on a daily basis at the end of each working shift for the construction of the final overlays."

B5707 APPLYING THE PAINT

Add the following:

"Where the runway or taxiway is to be re-opened to traffic after shifts, the Contractor will be required to apply all necessary paint markings at completion of each such shift within a designated area. The paint shall be non-reflectorised and applied strictly in accordance with the manufacturer's instructions. The paint shall be normal road marking paint complying with SABS 731. Solvent-based paints will be used for temporary paint markings and water-based paint for all permanent paint markings. At the start of the project, the Contractor will supply samples of the paint he intends to use and apply trial sections to the satisfaction of the Engineer.

The contractor will not be permitted to occupy a new construction zone before the final road markings for the current construction zone have not been completed.

No separate payment will be made for establishing the road-marking team on site during the construction period, irrespective of the number of times the road-marking team is required on the site or is required to move within the site, and full compensation shall be included in the rates tendered for road marking."

B5714 MEASUREMENT AND PAYMENT

Item	Unit
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B57.06	Setting out and premarking the lines (excluding traffic-island markings, lettering and symbols)
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ADD THE FOLLOWING:

"Referencing of existing road markings prior to milling and other operations, shall be included in the tendered rate for setting out and pre-marking."

C3.6.19 SECTION 5800: LANDSCAPING AND GRASSING

B5803 LANDSCAPING THE AREAS

(a) Shaping

Replace the term "road reserve" with "runway end safety areas and runway strips"

B5805 GRASSING

(c) Hydroseeding

Add the following:

During seeding, the seed mixture shall be regularly mixed by hand in order to prevent the separation of smaller and larger seeds in the mixture. After seeding, the soil surface shall be lightly raked parallel to the contours in order to cover the seed. During raking, care shall be taken to prevent the redistribution or removal of seed from any area. Seeding to comply with supplier's guidelines and all additional costs are deemed to be included in tendered rates. This includes shade netting at areas close to runway thresholds."

B5806 PLANTING AND MAINTAINING THE PLANTS

(a) Watering, weeding, mowing and replanting

Add the following to the second paragraph:

"The Contractor shall remain off newly grassed areas or areas that have been prepared for grassing. Any damages caused by the Contractor to newly grassed areas or areas that have been prepared for grassing shall be repaired to the satisfaction of the Engineer, at the Contractor's own expense."

(c) Maintenance period

Add the following before the first paragraph:

"In this subclause all reference to the maintenance period in respect of grass shall mutatis mutandis also apply to the maintenance of the shade netting required to protect the grass sods or newly planted hydroseed against the damage caused by jet blast. The maintenance period is also one (1) year and comprises the repair and securing of the netting as and when required by the Engineer. The Contractor may be required to remove the netting before the maintenance period has expired."

B5809 MEASUREMENT AND PAYMENT

Amend the payment unit in subitems to 58.04(c)(ii) as follows:

Item	Unit
B58.04 Grassing:	
(c) Hydroseeding	
(ii) Providing an approved seed mixture for hydroseeding	Prov-Sum

The expenditure under this item shall be made in accordance with the general conditions of contract and also Clause 6.5.1.2.3 of the contract data.'

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C3.6.20 SECTION 5900 : FINISHING THE ROAD AND ROAD RESERVE AND TREATING OLD ROADS

B5901 SCOPE

ADD THE FOLLOWING:

"Where reference is made in this section to 'the road and road reserve', this shall also be deemed a reference to 'the Site of the Works'."

B5904 MEASUREMENT AND PAYMENT

Unit

ADD THE FOLLOWING ITEM:

"Item Unit

B59.03 Finishing the Site of the Works lump sum

The tendered lump sum shall include full compensation for clearing, trimming, disposing of material, tidying and all other work required to finish off the Site of the Works as specified."

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C3.6.21 SECTION 7100: CONCRETE PAVEMENTS

B7102 MATERIALS

(e) Materials for joints

Add the following sub-sub-clauses:

“(viii) Two-component self-levelling elastic joint filler, based on Polysulphide Polymer

All joints and cracks in the concrete pavement covered in this contract shall be sealed using a two- component, polysulphide sealant. The sealant may have moderate resistance to motor fuels, solvents and chemicals but shall have full resistance to jet blast and aircraft fuels. The product shall be certified (or qualify for certification) by the CE hallmark according to EN-14188-2, Class A, B and C or US FED SPEC SS – S – 200E(2).

(ix) Supporting materials for two-component polysulphide sealant

The backing strip shall be a closed cell polyethylene cord with a minimum density of 30 kg/m³ unless otherwise approved by the engineer.

Surfaces shall be fully primed with an approved primer before the sealant is introduced.”

B7103 REQUIREMENTS IN RESPECT OF CONCRETE

(d) Specified Strength

In point (ii) replace “28-day flexural strength of 4,5MPa” with “28-day flexural strength of 5,5MPa.”

Add the following to point (ii):

“The requirements of Clause 7602(b)(iv) must also be achieved.”

B7120 JOINT SEALING

Add the following sub-clauses:

“(d) Two-component, polysulphide sealant

(i) Materials

Material used for the sealing of joints shall not be older than six (6) months. The age of the sealant shall be certified by an approved testing facility. All sealant delivered to site shall be batch marked (batch n^o,

Confidential

date, colour coded etc) and used in the order of batch receipt i.e. batch n° 01 used completely before batch n° 02 is used etc. The contractor shall keep a record of where each batch of sealant is used.

The manufacturer shall supply to the contractor a "certificate of compliance" for each batch of sealant delivered to site.

(ii) Installation

Prior to commencing with the sealing operations, the contractor shall submit to the engineer for his approval a Quality Control (QA) plan, stating clearly how he will ensure that the seals are correctly installed. The QA plan shall have definite hold points that will require the signature of both the contractor's foreman and the engineer's representative before the next step may commence. Once the QA plan has been approved, the contractor shall prove, by means of a trial section, that his objectives can be met. Continued deviation from the approved QA plan, or failure to obtain the required signature at the stipulated hold points, shall be sufficient reason for the engineer to reject that portion of the seal."

Resealing existing joints.

The existing seals including backing material shall be removed immediately prior to the resealing operation and traffic shall be kept off the pavement until the new, cured, seal is in place. The joint face shall be treated by an approved method (not sandblasting) to remove all dirt and old sealant and blown clean with oil-free compressed air, as per the requirements of the sealant supplier, immediately before the supporting materials are installed. Where a primer is required, it shall be applied before the supporting materials are installed.

B7114 CURING

In the second paragraph second sentence replace "0,35l/m²" with 0,50l/m²."

B7127 MEASUREMENT AND PAYMENT

Item	Unit
B71.04 Texturing and curing the concrete pavement	
(a) Burlap-dragged.....	square metre (m ²)
(b) Curing (applied at 0,5l/m ²)	square metre (m ²)

B71.06 Joints

Add the following payment sub-item:

- (i) Sealing of joints in existing concrete pavements as follow:
- (a) Joints (less than 15 mm wide).....metre (m)
- (b) Joints (15 mm to 25 mm wide)..... metre (m)
- (c) Joints (25 mm to 40 mm) metre (m)

B71.09 Removing existing concrete works in rehabilitation work

- (a) Concrete without reinforcement to be crushed to (specify size) and temporary stockpile on airport premises as directed by Engineer cubic metre (m³)
- (b) Concrete to be disposed off site by the Contractor cubic metre (m³)

Contract
Part C3: Scope of work
Reference no. 1327

C3 - 92

C3.6.12
Particular (Project) Specification
SECTION 7100

Confidential

Add the following new section

C3.6.22 SECTION 7600: CONCRETE PAVEMENT REHABILITATION

B7601 SCOPE

This section covers maintenance and repairs to existing concrete pavement and includes for materials, preparation, construction and finishing of the Works. Section 7600 shall also be read in conjunction with Section 7100 Concrete Pavements. However, where conflict arises, the requirements of Section 7600 shall take preference.

The main types of repair work included under this section are as follows:

- (a) Full depth Repairs
- (b) Partial Depth Repairs
- (c) Crack Repairs and Sealing
- (d) Subsealing and slabjacking

B7602 FULL DEPTH REPAIRS

(a) Description

Full depth repairs to existing concrete panels shall be carried out as indicated on the drawings and or confirmed by the Engineer at the positions of both transverse and longitudinal cracking where the degree of cracking has progressed to high severity and where there is evidence of surface spalling or faulting. The repairs under this section covers all repair areas shorter than approximately 30m and or narrower than approximately 5m. Full depth repairs shall also be required where spalling at joints or surface "pop- outs" extend beyond a depth greater than 75mm from the surface.

The positions and minimum dimensions of the various types of repair sections together with the type of joint preparation required, are as shown on the drawings, and the location of panels to be repaired shall be designated by the engineer.

Full depth repair work shall include: saw cutting around the perimeter of the repair sections; breaking up and removal of the concrete paving within the repair section; preparation of surfaces including repairs to subbase and application of bond-breaker or wet to dry epoxy to faces; drilling and placing of tie-bars or dowel bars; placing and finishing of new concrete. The nature of full depth repairs therefore is such that all designated defective concrete pavement panels shall be replaced in part or full and that such work generally requires labour intensive construction methods.

(b) Materials

A rapid set concrete shall be used for all full depth repairs. The accelerated strength shall be gained by using CEM I 52,5 in conjunction with an accelerator, but only if approved. All mix designs shall be compiled by an approved concrete testing laboratory and approved by the engineer.

Materials shall comply with Section 7100 except for the following revisions:

- (i) Item 7102(a) - Cement shall be CEM I 52, 5 complying with SABS EN 197-1.
- (ii) Item 7102(d) – An accelerator may be used to accelerate the early gain in strength of the repair concrete only if approved by the engineer. The accelerator shall not exceed 2% by mass of the cement.
- (iii) Item 7102(e), add "(viii) Adhesive Products – Wet to Dry Epoxy for the bonding of fresh concrete to old concrete surfaces shall be Epidermix 344 applied strictly in accordance with the manufacturer's instructions. Tie-bars shall be installed using Epidermix 372 epoxy. Over-cuts at corners of panels shall be filled with Epidermix 314."

Contract
Part C3: Scope of work
Reference no. 1327

C3 - 93

C3.6.12
Particular (Project) Specification
SECTION 7100

Alternative products of similar quality may be used in place of the above products but subject to the approval of the engineer.

- (iv) Item 7103(d), add "(iii) – The minimum required compressive strength of the full depth concrete repair prior to re-opening to traffic shall be the compressive strength equal to a flexural strength of 3,8MPa, to be achieved within 4 days after placing."

Lean mix concrete shall be a class 1:7:7/38 and comply with the requirements in clause 6404.

(c) Requirements in Respect of Concrete

The requirements of Section 7100 shall apply but the concrete shall attain the specified strength within sufficient time in order that the requirements as regards traffic accommodation set out in Section 1500 can be met.

(d) Removal of Existing Concrete

Prior to removal of concrete an initial full depth pilot saw cut shall be made 60mm inside the boundary of the repair area and the concrete within this initial saw cut shall be removed by either of two methods – (i) THE BREAK UP AND CLEAN OUT METHOD or (ii) THE LIFT OUT METHOD. Any repairs necessary to the subbase and adjacent slabs due to damage caused by the removal and breaking out of the concrete shall be to the contractor's cost.

THE BREAK UP AND CLEAN OUT METHOD can be carried out with a front-end loader used together with a jackhammer. Breaking out may also be assisted by additional intermediate saw cuts. The breaking operation shall proceed from the centre of the repair area towards the boundary saw cuts to eliminate damage to the adjoining slabs. Care shall also be taken with this method to avoid damage to the subbase or to adjacent slabs.

THE LIFT OUT METHOD requires lifting hooks to be attached to the slab and heavy lifting equipment to lift out larger areas. Alternatively, the slab may be sawed into smaller pieces so that they can be lifted out by a front-end loader.

If during the process of breaking out the concrete, the sawn edge of the remaining concrete is damaged beyond the repair boundary, a further pilot cut parallel to the initial cut shall be sawn without any payment to the contractor.

After removal of the bulk concrete a final saw cut, 50 mm deep, shall be made on the boundary of the repair area, 60 mm back from the pilot cut. This remaining 60mm vertical wedge shall be chopped out using hand tools or light pneumatic hammers with a maximum size of 14 kg, in order to produce a rough vertical face for aggregate interlock load transfer. Where saw cuts cross over each other at corners of repair areas, the saw cuts extending beyond the boundary of the repair shall be filled with an approved epoxy filler to the surface of the concrete pavement and the cost of such work shall be included under the rates for the repair.

The contractor shall demonstrate by means of a trial that he is able to achieve a full depth penetration of the epoxy into the saw cuts extending beyond the boundary of the repair.

Broken up concrete shall be removed from the road and road reserve and spoiled at locations arranged by the contractor himself. No overhaul will be payable for the removal of broken up concrete or any other materials resulting from the breaking up of concrete. The minimum width and length of the concrete patch shall be 2m.

(e) Preparation of Repair Area

After the existing concrete has been removed, the repair area shall be cleaned out using oil-free compressed air to remove all dust and loosened concrete. Any partially loosened concrete that remains shall be removed by wire brushing.

The subbase shall then be examined by the Engineer and any loose or unstable material which has been disturbed below the desired level of clean-out, shall be removed and replaced. The disturbed area shall be neatly cut out to dimensions and depths as directed by the engineer and the excavated cavity shall be cleaned of all loose debris. The underlying pavement layers shall be compacted if required to the satisfaction of the engineer and the cavity backfilled with lean mix concrete (as indicated by the Engineer) to a finished level with the adjacent subbase.

Where specified on the drawings, tie-bars or dowels shall be placed into the face of the existing slab. Dowel bars shall be installed for all interfaces with adjacent slabs and tie-bars shall be installed along all cut faces within the same slab in case of partial slab construction. The equipment used for drilling tie- bars or dowels shall preferably be the hydraulic percussion type and the drill shall not crack or spall the adjacent concrete. Tie bar or dowel holes shall be drilled at mid-depth of the slab and the diameter of the hole shall be a minimum of 4mm but not more than 8mm larger than the tie bar or dowel diameter. A drill support system, using the pavement surface or subbase as a reference, shall be required to assure hold alignment. Hand-held drills will not be allowed.

After drilling, the tie-bar or dowel holes shall be cleaned out with compressed air prior to grouting in the tie-bars or dowels using an approved quick setting non-shrink epoxy. The material shall be injected to the rear of the hole and must be dispersed along its length to ensure that the tie bars or dowels are completely covered and no voids exist. Lockset resin cartridge anchor systems may also be used. The bars or dowels shall be inserted with a twisting motion and seated in place by tapping. Tie-bars and dowels shall be placed parallel to the surface and centre line of the pavement for transverse joints or perpendicular to the centre line for longitudinal joints. A tolerance of not more than 2 mm in 250 mm from correct alignment, either vertical or horizontal, shall be permitted.

If required, steel reinforcement in accordance with the drawings shall be placed in the appropriate position and hold in place by stools. Steel reinforcement shall not be in contact with dowels and a spacing of at least 75 mm shall be maintained between dowels and steel reinforcement.

After placing of tie-bars, dowels or steel reinforcing, the repair area shall again be cleaned out with oil free compressed air at a minimum pressure of 0,5N/mm². The subbase shall then be coated with bitumen-based bond breaking agent or prime coat as indicated by the Engineer and the vertical faces of existing paving coated with bond-breaker or wet to dry epoxy as indicated on the drawings. Wet to dry epoxy shall only be applied to a clean, dry concrete face, free of all dirt, loose material, etc.

(f) Placing of Concrete

The time intervals between sawing, concrete removal, preparation and placing new concrete, shall be as short as possible in order to eliminate or reduce any potential for slab creep.

The subbase shall be dampened down, joint faces shall be coated with bond-breaker tack coat and tied joint faces coated with wet to dry epoxy to the vertical concrete faces. The repair concrete shall be placed when the wet to dry epoxy is tacky and within the time limit stipulated by the manufacturer of the epoxy.

Where rapid set concrete is required for early re-opening to traffic the contractor shall be required to mix the concrete as close as possible to the location of the repair area in order to avoid premature setting of the concrete prior to placing. The concrete shall be placed and evenly spread up to the level of the mesh reinforcing as shown on the Drawings. The mesh shall then be placed in position and the remainder of the concrete placed. The mesh shall be accurately cut to the dimensions required and shall be discontinuous at joints. The concrete shall be compacted in place by means of an internal poker vibrator particularly near the edges and corners. The surface shall be struck off at least twice with a screed flush with the existing pavement at the repair limits. While the concrete is still plastic, the contractor shall test the repair surface for tureens and this shall be finished flush with the surrounding pavement to within a tolerance of $\pm 3\text{mm}$ between the surface of the repair and a straight edge.

Where two adjacent panels are placed together across a joint, transverse and / or longitudinal joints shall be formed by means of saw cutting as shown on the Drawings. It is important that the initial saw cut to the joint be carried out at the correct time and depth in order to avoid shrinkage cracks developing. Initial saw cutting time is dependent on temperature, curing etc. and should be carried out when the

Confidential

concrete strength is approximately 4 MPa and when only slight ravelling of the joint occurs. The joint shall be sawed before the concrete cracks but definitely before 24 hours have elapsed after placement.

Where a full depth repair abuts a joint, the vertical face of the joint shall be coated with a bitumen bond- breaker, an insert or joint forming medium such as closed cell polyethylene, shall be secured against the joint face of the adjacent panel in order to maintain the existing joint width. It is the intent of this requirement to prevent contact between the repair and any adjacent slab which could cause a compression or other type failure in the fresh repair concrete.

Joints for tie-bar interfaces need not be sealed but the joint face need to be coated with wet to dry epoxy before casting the concrete.

Only after the repair has been completed and gained adequate strength, shall the joints be re-sealed in accordance with Clause 7120.

Concrete patches shall be protected from the rain until the concrete has reached a compressive strength of 30 MPa.

(g) Texturing and curing

Texturing and curing shall comply with Section 7100. Generally, the repair material may be lightly brushed against the hardened edges around the perimeter with a soft brush and a surface texture applied which match the existing texture as far as possible.

Hand operated texturing devices shall be allowed and the preferred method is the application of the burlap drag followed by a metal tine grooving device. The depth of texturing shall be between 4 and 6 mm and the spacing of the grooves shall not be less than 10 mm and not more than 40 mm apart. The direction of the texturing shall be at right angles to the direction of traffic movement and as approved by the Engineer. The surface texture shall be applied and completed before the concrete is so hard that the surface will be torn and coarse aggregate unduly loosened during texturing. I

The repair shall be cured immediately after casting by the application of an approved resin based white pigmented curing compound. In order to assist accelerated curing for earlier re-opening to traffic the repair shall be covered with black polythene sheeting as soon as it can be put on without damaging the surface. In hot weather the repair shall first be covered with wet hessian before covering with the polythene sheet. During cold weather or at night, the polythene sheeting shall be covered over with polystyrene sheeting or other insulation board. Concrete shall not be placed to the repair areas unless the ambient temperature is at least 5°C and rising.

(h) Reinstating subbase with lean mix concrete

It may be required that the subbase be reinstated with lean mix concrete. The roadbed shall be cleaned out to remove all stones and other debris.

The subbase shall then be examined and any loose material which has been disturbed below the desired level of clean-out, shall be removed and repaired. The disturbed area shall be neatly cut out to dimensions and depths as directed by the engineer and the excavated cavity shall be cleaned of all loose debris. The minimum lean mix concrete thickness shall be 100mm. The underlying pavement layers shall be compacted if required to the satisfaction of the engineer and the cavity backfilled to the level of the adjacent roadbed layers with a commercial G6 material and compacted to 93 % mod. AASHTO density.

The roadbed shall be dampened down before the placement of the lean mix concrete. The lean mix concrete shall be placed, evenly spread up to the level of the subbase and compacted by means of vibrating pockers. Care shall be taken not to spill and contaminate the adjacent concrete slabs. A period of 24 hours shall lapse after the reinstatement of the subbase and the reinstatement of the concrete panels on top.

B7603 PARTIAL DEPTH REPAIRS

(a) Description

Contract
Part C3: Scope of work
Reference no. 1327

C3 - 96

C3.6.12
Particular (Project) Specification
SECTION 7100

Confidential

Thin bonded repair work may be carried out to shallow spalling at the arrises and joints, or at the corner of a panel or at cracks, and to pop-outs which have occurred on the slab surface. Where the depth of spalling or defective concrete exceeds 75mm, or where indicated by the Engineer, repairs shall be executed by means of a Full Depth Repair as described under Section B7602. Small joint spalls with an area less than 150mm in length and 40mm in width at the widest point need not be repaired but shall be filled with joint sealant as directed by the Engineer.

(b) Materials

(i) Concrete Repairs

A fine graded concrete mix with small size coarse aggregate, shall be used for partial depth repairs. The design mix should adopt the least amount of water necessary in order to reduce the drying shrinkage of the fine concrete to a minimum. All mix designs shall be compiled by an approved concrete testing laboratory and approved by the engineer.

The materials shall comply with Section 7100 except for the following revisions: Item

7102(a) – Cement shall be CEM I 52.5 complying with SABS ENV 197-1.

Item 7102(c)(ii)(5) – The coarse aggregate for this type of repair shall be supplied in one nominal size only and shall be 9,5mm size stone, or as recommended by an approved concrete testing laboratory.

Item 7102(d) – An accelerator may be used to accelerate the early strength gain of the repair concrete only if approved by the engineer. The accelerator shall not exceed 2% by weight of the cement.

Item 7103(d), add "(iii) – The minimum required compressive strength of the full depth concrete repair prior to re-opening to traffic shall be the compressive strength equal to a flexural strength of 3,8MPa."

(ii) Asphalt Materials

If so instructed by the Engineer, asphalt materials shall be used for temporary partial depth repairs, comprising a hot or cold asphalt mix suitable for temporary repairs to the concrete pavement. The maximum sized aggregate used in the material shall be 9,5mm nominal size.

(iii) Requirements in Respect of Concrete

The requirements of Section 7100 shall apply but the concrete shall attain the specified strength within sufficient time in order that the requirements as regards traffic accommodation as set out in Section 1500 can be met.

(iv) Preparation of Repair Area

Partial depth repairs shall be constructed at locations shown on the plans or as directed by the Engineer. A sawcut shall be made around the perimeter of the repair area to provide a vertical face at the edge with a maximum depth of 60mm. Near vertical edges resulting from the use of milling or grinding machines shall also be considered acceptable provided the vertical faces are suitably scabbled to the engineer's satisfaction. Where spalls occur at joints the length of repair shall extend a minimum of 75mm beyond the defective concrete and the width of the repair from the joint shall be a minimum of 150mm, to ensure removal of all unsound concrete. For thin bonded surface repairs, the repair area shall extend a minimum of 75mm beyond all unsound concrete and be at least 150mm x 150mm with a minimum depth of 75mm. The minimum extensions of sawcut boundaries listed above, must also apply beyond any hollow sounding or delaminated concrete.

Concrete within the repair area shall be broken out to a minimum depth of 75mm with pneumatic tools and until sound and clean concrete is exposed. If the depth of the repair exceeds 100mm, the entire area should be removed and replaced according to specification Section B7602 pertaining to Full Depth Repairs. It is the intent of this specification that proper size tools be used which will not fracture the

Confidential

concrete below that needed to reach sound and clean concrete. The maximum weight of a pneumatic hammer shall therefore be 14kg.

After removal of all unsound concrete the repair area shall be cleaned out using oil free compressed air to remove all dust and loosened concrete. Any partially loosened concrete that remains shall be removed by wire brushing after which the area shall again be cleaned out with compressed air and water at a minimum pressure of 1,0 N/mm² immediately prior to placing the repair material.

Where saw cuts cross over each other at corners of repair areas, the saw cuts extending beyond the boundary of the repair shall be filled up with an approved epoxy filler to the surface of the concrete pavement and the cost of such work shall be included under the rates for the repair.

The contractor shall demonstrate by means of a trial that he is able to achieve a full depth penetration of the epoxy into the saw cuts extending beyond the boundary of the repair.

Where instructed by the engineer, the repair shall be reinforced using dowel bars and welded steel fabric as detailed on the drawings.

(v) Placing Repair Material

Prior to placing of the fine concrete, a wet to dry epoxy shall be applied to all horizontal and vertical surfaces, except the vertical face of an adjacent working joint or crack. The wet to dry epoxy shall be applied as soon as possible after final preparation of the repair area and shall be applied to a clean, dry surface free of all dirt, loose material etc. Where a partial depth repair abuts a joint or crack, the vertical face of the longitudinal construction joint or crack shall be coated with a bitumen bond-breaker, an insert or joint forming medium such as closed cell polyethylene, shall be secured against the joint face of the adjacent panel in order to maintain the existing joint width and to prevent mortar from entering the joint or crack void. It is the intent of this requirement to prevent contact between the repair and any adjacent slab which could cause a compression or other type failure in the fresh repair concrete.

The fine concrete shall be placed when the epoxy coating is tacky and within the time limit stipulated by the manufacturer of the wet to dry epoxy, and shall be compacted to eliminate all voids at the interface of the repair concrete and the existing concrete. Compaction may be carried out using hand tamping together with a vibrating screed board.

As only small quantities of concrete mix are normally required for partial depth repairs it is preferable that the aggregates are dried and that the aggregates and cement are pre-weighed in plastic bags for easy transportation and mixing at the location of the repair. The methods of proportioning and mixing the repair material shall be to the approval of the engineer and shall also comply with Section 7100 of the Specifications.

Where a partial depth repair is placed across a longitudinal construction joint, the joint shall be reformed while the concrete is still plastic by using a thin cutting tool and a straight edge.

Only after the repair has been completed and gained adequate strength, shall the transverse joints be re-sealed in accordance with Clause 7120.

All repairs shall be finished flush with the level of the surrounding slab to within a tolerance of $\pm 3\text{mm}$.

(vi) Texturing and Curing

The requirements of Clause B7602(g) shall apply.

(vii) Temporary Partial Depth Repairs Utilising Acrylic Epoxy or Asphalt Materials

The preparation of the repairs shall be as specified in Clause 7603(d) but reinforcing fabric shall not be required. Repairs using asphalt material shall be deemed temporary repairs and shall be only utilised where emergency repairs are required. Such temporary repairs shall only be utilised where emergency repairs are required. Such repairs shall be replaced with concrete or acrylic epoxy when practicable.

Contract
Part C3: Scope of work
Reference no. 1327

C3 - 98

C3.6.12
Particular (Project) Specification
SECTION 7100

Confidential

B7604 CRACK REPAIRS**(a) Description**

This type of repair shall be carried out to transverse or longitudinal cracks as indicated by the Engineer, which are of at least medium width and exhibit spalling. The repair includes the routing (no other method will be allowed) of cracks in width and depth ranges as detailed to suit the degree of cracking/spalling, the installation of a closed cell expanded polyethylene backing strip, where required, and sealing with a sealant. If the slot cut to receive the sealant is shaped so that the sealant can be installed to its correct shape without the use of a backing strip, then the latter may be omitted, provided that a suitable bond breaker can be applied to the base of the slot without contaminating the sides.

Some longitudinal cracks that have opened may require stitching to prevent further opening and grouting to restore shear resistance across the joint.

(b) Materials

Grout used for filling cracks shall be an approved non-shrink cementitious based grout, and its consistency when mixed shall be such that it will be able to gravitate to the full depth of the crack when poured in from the surface. Where cracks in excess of 15mm are to be filled, a pre-mixed non-shrink cementitious grout/fine aggregate mix may be substituted. Pre-mixed grout/fine aggregate mix shall be supplied in suitable containers pre-mixed by the supplier to achieve the desired strength and flow characteristics.

The minimum 100 mm cube compressive strength of the grout shall be 30 MPa prior to re-opening to traffic.

All sealant materials, primers and backing medium shall be certified or tested and approved by the engineer before being incorporated into the work. When requested by the engineer the, contractor shall furnish a complete written statement of the origin, composition and manufacture of any or all materials that are to be used in the work. Where installation procedures or any part thereof are required to be in accordance with recommendations of the manufacturer of sealing compounds, the contractor shall submit catalogue data and copies of recommendations prior to installation of the materials.

The backing strip shall be a closed cell polyethylene with a minimum density of 30 kg/m³ and shall be an approved brand such as "Sondor" or similar and shall be subject to the engineer's approval.

The epoxy used for securing the bars in stitched repairs shall be PROSTRUCT 638' pourable epoxy grout or similar approved.

The stitching bars shall be 12 mm nominal diameter high yield reinforcing steel cut to lengths. The requirements of Section 6300 shall apply where applicable.

The sealant shall be DowCorning a self-levelling two component Polysulphide complying with required properties as indicated in Section 7100. Where a primer is required this shall be strictly in accordance with the manufacturer's recommendation.

(c) Construction**(i) Widening of Crack**

The routing machine shall be capable of following closely the path of the crack and of widening the top to form a routed reservoir of the required section without causing excessive spalling or other damage to the concrete. The routing shall also be executed in such a way that the actual crack is always visible in the middle half of the widened slot with vertical and parallel sides to the crack. A second pass may be required to provide vertical faces to both sides of the crack. A router shall be used to widen the crack to the slot dimensions as detailed on the Drawing.

(ii) Equipment

The router's cutting bit must be manufactured on a vertical rotating shaft with or without a vertical oscillating action, which is manually pushed or self-propelled at a pre-set depth. The router shall be lifted with shields to control flying debris and dust. Routers with a horizontal rotating shaft or a concrete saw shall not be accepted.

(iii) Cleaning of Crack

The crack shall be thoroughly cleaned using a high-pressure water jet to remove all cuttings or debris remaining on the faces and in the crack opening. Cleaning of cracks may be assisted by tools such as hard nylon brushes. After water cleaning, and before grouting, surplus water shall be allowed to drain or be blown out using an air hose but care must be taken to prevent splashing mud onto the face of the crack.

(iv) Grouting of Cracks

Normally, all open cracks wider than 3mm shall be grouted. Existing concrete shall be saturated where possible before grout is poured into a crack. Excess water shall be removed immediately prior to the grouting operation.

Grout of the correct consistency shall be poured into the crack until it is full. After 24 hours, any bleeding water shall be blown out and the process shall be repeated until the crack is filled with grout.

(v) Stitching

Where required stitching shall be carried out to active cracks and certain longitudinal joints where instructed by the engineer. This operation shall be completed before the crack or joint is sealed. The stitching details for both crack repairs and longitudinal joints are shown on the Drawings. Cleaning of the grooves for the tie-bars shall be as specified elsewhere for the cleaning of cracks and joints. The application of the epoxy grout to secure the tie bar shall be strictly in accordance with the manufacturer's recommendations. Under no circumstances shall the recommended working time of the epoxy grout be exceeded.

(vi) Cleaning of Slot

Immediately after grouting, the widened slot that is to be sealed shall be brush cleaned to ensure that no grout remains in the slot.

For final cleaning, immediately prior to installation of the backing medium, the slots shall be blown out with oil-free compressed air at a minimum pressure of 0,5 N/mm². Care shall be taken to ensure that grout is not removed from the underlying crack. This process shall be repeated if necessary, until the slot is thoroughly cleaned of all foreign material and new, clean, dry concrete faces are exposed prior to sealing. If necessary, further drying using soot-free hot air shall be carried out.

(vii) Priming

Where the sealant to be used requires priming of the crack before installation, the priming procedure shall follow the manufacturer's instructions for proper application rate and proper time of cure before the sealant is applied. In most cases the primer cure time will change as the temperature and relative humidity changes. Should the recommended maximum primer cure time be exceeded, a fresh coat of primer shall be applied, at the contractor's expense, prior to installation of the sealant.

Prior to application of the primer the widened slot over the crack must be thoroughly dry and clean. Any necessary cleaning, air blasting etc. shall be completed before priming and installation of backing strip and sealant.

(viii) Installation of backing Medium or Bond-Breaker

The backing medium shall be a closed cell polyethylene strip and shall act as a bond-breaker between the bottom face of the slot and the silicone sealant. The backing strip shall be compatible with the sealant, clean and free of scale, foreign matter, oil or moisture, and shall be non-absorbing. Every effort

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shall be made to ensure that the sides of the slot are not contaminated during the application of the bond-breaker or insertion of the backing medium.

(ix) Installation of Sealant

The installation of sealants is to be done as soon after priming (if required) and placing of the backing strip as reasonably possible to ensure that the slot is still clean and dry. In the event the slot does become contaminated, damp, or wet, the backing strip is to be removed, the slot cleaned and dried, and a new backing strip and primer re-applied prior to placing the sealant material, all at the contractor's expense. The sealant shall also be applied within the time limit specified by the manufacturer after priming the sides of the slot.

The sealant material shall be applied by pumping through a long nozzle or with a hand gun. The pumping equipment shall be of sufficient capacity to deliver the necessary volume of material to completely fill the slot to the specified width and height of sealant in one pass. The nozzle shall be of sufficient size and shape to closely fit into the slot and introduce the sealant inside the slot with sufficient pressure to prevent voids occurring in the sealant and to force the sealant into contact with the slot faces.

Any excess material on the surface of the pavement shall be removed and the pavement surface shall be left in a clean condition. Unless otherwise specified, the period of cure shall be in accordance with the manufacturer's recommendations. Vehicular or heavy equipment traffic shall not be permitted on the pavement in the area of the cracks until the sealant is tack free and debris from traffic does not embed into the sealant.

B7605 SLAB REPLACEMENT

(a) Description

The replacement of an entire slab will only be done on the instruction of the engineer.

Slab replacement shall include: breaking up and removal of the concrete and joint material within the repair section; preparation of the surfaces including repairs to the subbase and the application of a bond- breaker or a wet-to-dry epoxy; placing and finishing of the new concrete as well as reinstating the joints.

Payment for this type of repair will be made under payment item B76.01 as for full depth repairs

(b) Materials

A rapid set concrete shall be used for all slab replacements. The accelerated strength shall be gained by using CEM I 42,5N in conjunction with an approved accelerator. All mix designs shall be compiled by an approved concrete testing laboratory and is subject to the approval of the engineer.

Materials shall comply with Section 7100 except for the following revisions:

- (i) Item 7102(a) - Cement shall be CEM I 42,5N complying with SABS EN 197-1.
- (ii) Item 7102(d) – An accelerator may be used to accelerate the early gain in strength of the repair concrete only if approved by the engineer. The accelerator shall not exceed 2% by mass of the cement.
- (iii) Item 7102(e), *add* "(viii) Adhesive Products – Wet-to-Dry Epoxy for the bonding of fresh concrete to old concrete surfaces shall be Epidermix 344 applied strictly in accordance with the manufacturer's instructions.

Alternative products of similar quality may be used in place of the above but are subject to the approval of the engineer.

- (iv) Item 7103(d), *add* "(v) – The minimum required compressive strength of the full depth concrete repair prior to re-opening to traffic shall be the compressive strength equal to a flexural strength of 3,8MPa."

Contract
Part C3: Scope of work
Reference no. 1327

C3 - 101

C3.6.12
Particular (Project) Specification
SECTION 7100

Confidential

Lean mix concrete shall be a class 1:7:7/38 and comply with the requirements in clause 6404.

(c) Requirements in Respect of Concrete

The requirements of Section 7100 shall apply but the concrete shall attain the specified strength within sufficient time in order that the requirements with regards to airport operations as set out in section 1200 can be met.

(d) Removal of Existing Concrete

The entire slab shall be removed by a method that will not damage the surrounding slabs and longitudinal keyed joints. Any repairs necessary to the subbase and adjacent slabs due to damage caused by the removal and breaking out of the concrete shall be for the contractor's own expense.

The breaking operation shall proceed from the centre of the repair area towards the pilot saw-cut, to eliminate damage to the adjoining slabs. Care shall be taken with this method to avoid damage to the subbase or the adjacent slabs.

Broken up concrete shall be removed from the concrete apron and spoiled at locations arranged by the contractor himself. No overhaul will be payable for the removal of broken up concrete or any other materials resulting from the repair work.

(e) Preparation of Repair Area

After the existing concrete has been removed, the repair area shall be cleaned out using oil-free compressed air to remove all dust and loosened concrete. Any partially loosened concrete that remains shall be removed by wire brushing.

The subbase shall then be examined by the engineer and any material which has been disturbed or damaged below the desired level of clean-out, shall be removed and repaired. The disturbed area shall be neatly cut out to dimensions and depths as directed by the engineer and the excavated cavity shall be cleaned of all loose debris. The underlying pavement layers shall be compacted if required to the satisfaction of the engineer and the cavity backfilled with a Lean mix concrete and finished level with the adjacent subbase.

The subbase shall then be coated with bitumen-based bond breaking agent and the vertical faces of existing paving coated with a suitable bond-breaker.

(f) Placing of Concrete

The time intervals between sawing, concrete removal, preparation and placing new concrete, shall be as short as possible in order to eliminate or reduce any potential for slab creep.

The joint shall be re-instated and cut to the existing joint dimensions and before the forming of any shrinkage cracks.

It is important that the initial saw-cut to the joint be carried out at the correct time and depth in order to avoid shrinkage cracks developing. Initial saw-cutting time is dependent on temperature, curing etc. and should be carried out when the concrete strength is approximately 4 MPa and when only slight ravelling of the joint occurs. The joint shall be sawed before the concrete cracks but within a maximum period of 24 hours after placement.

Where rapid set concrete is required for the early re-opening to traffic, the contractor shall be required to mix the concrete as close as possible to the location of the repair area in order to avoid premature setting of the concrete prior to placing. The concrete shall be placed and evenly spread up to the level of the mesh reinforcing as shown on the drawings for a full depth repair. The mesh shall then be placed in position and the remainder of the concrete placed. The mesh shall be accurately cut to the dimensions required and shall be discontinuous across the joints. The concrete shall be compacted in place by means of an internal poker vibrator particularly near the edges and corners. The surface shall be struck

off at least twice with a screed, flush with the existing pavement at the repair limits. While the concrete is still plastic, the contractor shall test the repair surface for tureens and this shall be finished flush with the surrounding pavement to within a tolerance of $\pm 2\text{mm}$ between the surface of the repair and a straight edge.

Where a full depth repair abuts a transverse or longitudinal weakened plane joint, an insert or joint forming medium such as closed cell polyethylene, shall be secured against the joint face of the adjacent panel in order to maintain the existing joint width. It is the intent of this requirement to prevent contact between the repair and any adjacent slab which could cause a compression or other type failure in the fresh repair concrete.

Only after the repair has been completed and gained adequate strength, shall the joints be re-sealed in accordance with Clause B7120.

Fresh concrete shall be protected from the rain and traffic until the concrete has reached a compressive strength of 30 MPa.

The edge of the repaired are shall be rounded and the existing concrete edge mechanically bevelled to the dimensions as shown on the drawings.

(g) Texturing and curing

Texturing and curing shall comply with Section 7100. Generally, the repair material may be lightly brushed against the hardened edges around the perimeter with a soft brush and a surface texture applied which match the existing texture as far as possible.

The repair shall be cured immediately after casting by the application of an approved resin based white pigmented curing compound. In order to assist accelerated curing for the earlier re-opening to traffic, the repair shall be covered with black polythene sheeting as soon as it can be put on without damaging the surface. In hot weather the repair shall first be covered with wet hessian before covering it with the polythene sheet. During cold weather or at night, the polythene sheeting shall be covered over with polystyrene sheeting or any other insulation board. Concrete shall not be placed to the repair areas unless the ambient temperature is at least 5°C and rising.

(h) Reinstating subbase with lean mix concrete

It may be required that the subbase be reinstated with lean mix concrete. The roadbed shall be cleaned out to remove all stones and other debris.

The subbase shall then be examined and any loose material which has been disturbed below the desired level of clean-out, shall be removed and repaired. The disturbed area shall be neatly cut out to dimensions and depths as directed by the engineer and the excavated cavity shall be cleaned of all loose debris. The underlying pavement layers shall be compacted if required to the satisfaction of the engineer and the cavity backfilled to the level of the adjacent roadbed layers with a commercial G6 material and compacted to 93 % mod. AASHTO density.

The roadbed shall be damped down before the placement of the lean mix concrete. The lean mix concrete shall be placed and evenly spread up to the level of the subbase. Care shall be taken not to spill and contaminate the adjacent concrete slabs. A period of 24 hours shall lapse after the reinstatement of the subbase before the reinstatement of the concrete panels on top.

B7606 SUBSEALING (SHALL NOT BE REQUIRED IN THIS PROJECT)

(a) Materials

(i) Mix design

The grout material shall consist of the following:

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- 1 part (by volume) portland cement
- 3 parts (by volume) Pozzolan or fly ash
- Sufficient water to achieve required fluidity

If ambient temperature is below 12°C an accelerator may be used subject to approval of the engineer. Consideration of the time required prior to opening the pavement to traffic is necessary.

- (ii) Portland cement

The requirements of subclause 7102(a) shall apply

- (iii) Water

The requirements of subclause 6402(d) shall apply.

- (iv) Pozzolans and fly ash

Pozzolans and fly ash shall meet the requirements of ASTM-618.

- (v) Fluidity

Fluidity of the grout slurry shall be measured by the corps of engineers flow cone method as per their specification CRD-C 611-80. Time of efflux for pozzolanic grouts shall range from 16 to 26 seconds. A more fluid mix having a flow cone time of efflux of 9 to 15 seconds should be used during the initial injection at each hole. These measurements shall be made not less than twice each day.

- (vi) Design mix

The contractor shall submit a design mix for materials and additives to be used as specified in this clause. The mix design shall include physical and chemical analysis for the pozzolans and tests of the grout slurry by an approved laboratory showing one day, three day, and seven day strengths, flow cone times, shrinkage and expansion observed and time of initial test. The seven day compressive strength shall not be less than 4,0MPa. The test specimens shall use the materials (including water and admixtures) which are to be used in the project.

- (vii) Grout for sealing of injection holes and slots for load transfer

Injection holes for subsealing and slots for load transfer shall be sealed with a cementitious grout (Duragrout 1000) or a similar approved material.

(b) Equipment

The contractor shall furnish all equipment necessary or incidental to the adequate performance and acceptable completion of the work as follows:

- (i) Grout plant

The grout plant shall consist of a positive displacement cement injection pump capable of applying 2MPa pressure, a high-speed colloidal mixing machine and a grout return system. The colloidal mixing machine shall operate at a minimum speed of 800 RPM, maximum speed to 2000 RPM, creating a high- shearing action and subsequent pressure release to make a homogeneous mixture.

The dry materials shall be accurately measured by weight or volume if delivered in bulk shall be packaged in uniform volume to sacks. The water shall be batched through a meter of scale capable of measuring the today day's consumption.

- (ii) Water tanker

If water tanker and pumps are not an integral part of the plant, water shall be supplied from a water truck with adequate capacity and pressure for delivery to the grout plant.

Contract
Part C3: Scope of work
Reference no. 1327

C3 - 104

C3.6.12
Particular (Project) Specification
SECTION 7100

Confidential

(iii) Drilling

An air compressor and rock drills or other device capable of drilling the grout injection holes through the concrete pavement and stabilised subbase materials shall be required. In addition, a coring machine shall be required to take cores through the pavement and to drill pilot holes to prevent breakout on the concrete pavement surface. The equipment shall be in good condition and operated in such manner that the holes are vertical and not "cut-of-round". Down-feed pressure whether by hand or mechanical means shall not exceed 90 kg maximum downward pressure. Holes shall be drilled in such a manner so as to prevent breakout at the bottom of the pavement.

(iv) Transport

Transport required for the transportation of all materials, equipment and personnel required for the subscaling of the concrete pavement must comply with all safety requirements and regulations applicable to vehicles operating on public roads.

(v) Miscellaneous

All necessary hoses, valving and valve manifolds, positive cut-off and bypass provisions to control pressure and volume, pressure gauges and gauge protectors, expanding packers and hoses to provide positive seal during grout injection, wood plugs, hole washing tools, drill steel and bits shall be provided by the contractor.

(c) Construction

(i) Drilling Holes

Grout holes for injection shall be drilled in a pattern determined by the engineer in consultation with the contractor. Holes shall be between 50mm and 60mm in diameter, drilled vertically and round and to a depth sufficient to penetrate through the stabilised subbase but not more than 75mm into the subgrade. Downfeed pressure, whether by hand or mechanical means, shall be drilled in such a manner so as to prevent breakout at the bottom of the concrete pavement.

(ii) Washing of holes

Holes shall be briefly washed to create a small cavity to allow for the initial spread of grout.

(iii) Subsealing

Locations with loss of support due to the presence of voids under the concrete pavement (normally located underneath the stabilised subbase layer) shall be subsealed by means of filling the voids with grout. During this operation a means of monitoring the lift of the slab will be undertaken by the contractor to ensure that the upward movement of the slab does not exceed 3mm. Each hole shall be pumped until:

- The maximum permissible pressure is built up
- The grout is observed flowing from hole to hole
- The grout is observed flowing out of longitudinal or transverse joints
- The maximum slab lift is attained
- A reasonable time has elapsed (± 2 minutes)

A maximum continuous pressure of 0,35MPa will be permitted to reduce the possibility of the slab raising except that a short surge up to 1,5MPa will be permitted when starting to pump the hole. In the event that the adjacent slab has been removed, the contractor shall pack the side of the slab to be subsealed in such a way that grout will not flow pass the packing.

(iv) Sealing of injection holes

After grouting has been completed at any one hole, the packer (expanding rubber used to seal the open space between the grout injection pipe and the hole) shall be removed and the hole plugged immediately with a tapered wooden plug. These plugs are only temporary and can be removed once the grout has set sufficiently to prevent back pressure from forcing the grout through the hole.

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Each hole must be permanently sealed flush with the pavement surface with a cementitious grout or other material approved by the engineer.

(v) Loss of grout

Excessive loss of grout during the subsealing and slabjacking operations through other injection holes, joints and cracks or the sides of the pavement will not be paid for.

(vi) Unanticipated conditions

In the event of the engineer determines that continued grout injection at any specific location due to major voids is no longer economically feasible, he should direct the contractor to cease grout injection at the location. The contractor will be paid at the unit price for the material used up to that point.

(vii) Changed conditions

The engineer, at his discretion, may delete any location or may add a new location to be subsealed or slabjacked (raised). Variation in the plan quantity at any specific location will not be considered cause for renegotiation of the unit prices.

(viii) Acceptance

All loose concrete, joint filler or grout accidentally or otherwise spilled on the surface of the concrete pavement or on the adjoining gravel shoulder/median and any other construction waste material shall be removed and the surrounding areas shall be left in a neat and orderly condition by the contractor prior to final acceptance of the work.

B7607 CONSTRUCTION TOLERANCES

(a) Level and Grade

The level tolerance on any portion of full depth fresh concrete cast between existing panels or portions thereof, shall be governed by the levels on the adjacent edges of the existing concrete. Where the fresh concrete is a portion of an existing panel the level shall be checked by a 3m straight-edge placed across the existing concrete edges and the level of the fresh concrete shall not deviate by more than $\pm 3\text{mm}$ from the line of the straight-edge. Where complete panels are replaced between existing joints, the longitudinal grade tolerance of each replaced panel shall be governed by the longitudinal grade along the edge of adjacent concrete panels remaining in position. The concrete shall be finished flush with the adjacent panels and the maximum deviation from the existing longitudinal grade shall not exceed $\pm 3\text{mm}$.

For thin bonded areas and surface repairs the fresh concrete shall be finished flush with the surrounding concrete to within a tolerance of $\pm 3\text{mm}$.

(b) Thickness

Where full depth panels or portions thereof, are replaced on top of the existing subbase layers, the nominal thickness of the concrete shall be equal to the nominal thickness of the adjacent concrete pavement.

(c) Surface Regularity

Where single concrete panels or portions thereof are replaced between existing panels, no irregularity of more than 3mm shall be measured with a rolling straight-edge or a 3mm long straight-edge laid along the centre line of the road.

(d) Testing frequency

For full-depth repairs the testing frequency for construction tolerances shall be as per the following:

Contract
Part C3: Scope of work
Reference no. 1327

C3 - 106

C3.6.12
Particular (Project) Specification
SECTION 7100

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TABLE 7606/1 TESTING FREQUENCY FOR CONSTRUCTION TOLERANCES

TEST	TESTING FREQUENCY
Surface Levels	9 Random Control Points per Panel
Width and Edge Alignment	Each Panel
Joint Alignment	Each Panel

B7608 TESTING OF MATERIALS**(a) General**

Concrete and grout mix designs shall be determined in accordance with the requirements of Section 7100 together with the revisions listed under Section B7600. All mix designs for approval shall be as recommended by an approved concrete testing laboratory and shall include full tests for both the aggregates and cements to be used in the mixes.

Routine inspection and acceptance of work shall comply with Clause 7124 and Section 8200.

(b) Aggregates

Testing of fine and coarse aggregates shall be carried out for every batch of aggregate delivered to site and shall include:

- Grading analysis
- Fineness modulus of sands and organic material
- Particle size distribution
- Flakiness index for stone
- Moisture content of sand to be checked every day and after any rain

(c) Concrete Mix

A slump test shall be taken for every batch of concrete.

A lot of concrete shall be tested for every full depth panel or group of panels cast on the same day. Where fine concrete is used for thin bonded repairs a minimum of 3 lots per day shall be taken. This frequency of testing may be increased or relaxed at the discretion of the engineer and depending on the amount of concrete being poured each day.

A lot shall include:

- cubes of 24-hour compressive strength
- 1 cube for 3-day compressive strength
- 1 cube of 7-day compressive strength
- 3 cubes for 28-day compressive strength
- 2 beams for 28-day flexural strength (concrete only)

If the initial results satisfy the relationship between compressive and flexural strength established by preliminary laboratory results, the necessity for beam tests may be relaxed at the discretion of the engineer.

Initially 24-hour, 3 day and 7-day compressive strengths are required to ensure the required minimum compressive strength is achieved prior to re-opening to traffic. This frequency of testing may also be decreased at the discretion of the engineer as soon as a relationship between minimum strength requirement versus time has been firmly established on site.

B7609 MEASUREMENT AND PAYMENT

Item	Unit
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B76.01 Full depth repairs using hand placed concrete (cement indicated):

- | | |
|---|-------------------------------|
| (a) Plain and dowel jointed concrete pavement of class 45/19 cement | |
| (b) Extra over item B76.01 (a) for rapid hardening concrete..... | cubic metre (m ³) |

The unit of measurement shall be the cubic metre of pavement placed by hand and finished in accordance with the Specifications and Drawings, and the quantity shall be the summation of the individual areas calculated by multiplying the length by the width at the top surface of the repaired panel by the average depth of the repair.

The tendered rate shall include full compensation for:

- Procuring, furnishing and storage of all materials
- Provision of all plant
- Saw cutting including both pilot and final cuts
- Epoxy filling of overcuts at corners
- Cutting existing reinforcement as required
- Preparing subbase including cleaning out and priming
- Determination of mix proportions
- Mixing, transporting, placing and finishing of the concrete, including formwork were required
- Mechanical texturing, curing and surface protection
- Disposal of surplus material and cleaning up
- Sampling and testing

Breaking out and removing concrete will be paid under item 71.09

In addition, the tendered rate shall also include full compensation for the preparation of joint faces in accordance with the specifications and drawings and shall include following:

- Cleaning of joint faces
- Supply and application of bond-breaker
- Supply and application of wet to dry epoxy
- Installation of joint former where required
- Initial saw cutting for crack control where two panels are cast together
- Saw cutting for installation of silicone sealant
- Forming of central key at longitudinal construction joints
- Provision of all plant and materials
- Disposal of surplus materials and cleaning up

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

B76.02 Partial Depth Repairs using hand placed fine concrete in the following ranges of area (cement type indicated)

- | | |
|--|------------------------------|
| (a) up to 0,25 m ² | cubic metre(m ³) |
| (b) Exceeding 0,25 m ² and up to 0,5 m ² | cubic metre(m ³) |
| (c) Exceeding 0,5 m ² | cubic metre(m ³) |

The unit of measurement shall be the square metre of partial depth repair placed by hand and finished in accordance with the Specifications and Drawings, and the quantity shall be the summation of the individual repair areas measured at the surface of the slab.

The depth of the repair shall be a minimum of 50 mm and a maximum of 75 mm. The tendered

rate shall include full compensation for:

- Procuring, furnishing and storage of all materials
- Provision of all plant
- Saw cutting or routing
- Breaking out and removing concrete
- Cleaning surfaces
- Supply and installation of polyethylene former to transverse and longitudinal weakened plane joints
- Supply and application of wet to dry epoxy
- Supply and application of bitumen bond-breaker as required
- Determination of mix proportions
- Mixing, transporting, placing and finishing of the concrete including formwork where require
- Reforming longitudinal construction joints as required
- Saw cutting for the installation of silicone sealant
- Mechanical texturing, curing and surface protection
- Disposal of surplus material and cleaning up
- Sampling and testing

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

B76.03 Joints

- | | |
|---|-------------|
| (c) Dowel bars (mild steel) (diameter and length indicated) | |
| (i) Installed in existing concrete in rehabilitation work..... | Number (No) |
|
(d) Tie bars (high tensile steel) (diameter and length indicated) | |
| (i) Installed in existing concrete in rehabilitation work..... | Number (No) |

The unit of measurement for joints in the pavement shall be the metre of completed joint, except that dowel bars and tie-bars across joints shall be measured separately by the numbers of each type installed.

Construction joints as such shall not be measured for payment and their cost shall be deemed to be included in the rate tendered for the concrete pavement. However, if the position of a longitudinal construction joint coincides with that of a hinge joint, the contractor will be paid at the rate tendered for the type of hinge joint replaced by the construction joint, provided that the requisite number and sizes of tie bars for the hinge joints are installed. Where the hinge joint replaced by the construction joint is a sealed hinged joint, the construction joint shall be sawn and sealed, in which case the contractor will be paid at the tendered rate for sawn and sealed hinge joints.

The tendered rates for expansion joints shall include full compensation for forming the joint complete with joint filler, rounding or chamfering the corners (if required) and installing a compression seal.

The tendered rates for longitudinal hinge joints shall include full compensation for sawing the joint (if required) and supplying and inserting the seal (if required).

The tendered rate for transverse contraction joints shall include full compensation for sawing the joint and installing the specified type of seal, including appurtenant materials, and for temporarily sealing the joint with paper rope.

The tendered rates for dowel bars and tie-bars shall include full compensation for supplying, cutting, placing, holding the bars in position, including a supporting framework or cradles where required, and fixing the end caps and bond breaking materials to dowels.

The tendered rate for forming and sealing the joints between asphalt and concrete pavements shall include full compensation for supplying all the necessary plant and materials, for forming a joint to the required dimensions in the asphalt seal, cleaning the joint and sealing it as specified in sub-clause 7120(c).

Item	Unit
B76.04 Crack repairs (width after routing indicated)	metre (m)

The unit of measurement shall be the linear metre of crack repaired in accordance with the specifications and drawings and the quantity shall be the summation of individual lengths measured along the line of the crack. The width shall be width of seal as measured after routing.

The tendered rate shall include full compensation for:

- Provision of all plant and materials
- Saw cutting and routing
- Cleaning
- Application of primer if required
- Installation of backing strip where required
- Installation of silicone sealant
- Bevelling of concrete edges
- Disposal of surplus material and cleaning up

The tendered rate will not include for grouting or stitching if required, which shall be measured under Item B76.06 and B76.08.

Item	Unit
B76.05 Grouting of cracks.....	metre (m)

The unit of measurement shall be the linear metre of crack grouted irrespective of width, in accordance with the Specifications, and the quantity shall be the summation of individual lengths grouted measured along the line of the crack.

The tendered rate shall include for the supply and mixing of the grout, pouring it into the crack, repeating the process as often as is necessary to fill the crack, and for subsequent cleaning of the slot and pavement surface of all grout.

Item	Unit
B76.06 Partial Depth Repairs using hand placed acrylic resin grout	square metre (m2)

The unit of measurement shall be the square metre of partial depth repair placed by hand and finished in accordance with the Specifications and Drawings, and the quantity shall be the summation of the individual repair areas measured at the surface of the slab.

The depth of the repair shall be a minimum of 50 mm and a maximum of 75 mm. The tendered

rate shall include full compensation for:

- Procuring, furnishing and storage of all materials
- Provision of all plant
- Saw cutting or routing
- Breaking out and removing concrete
- Cleaning surfaces
- Supply and installation of polyethylene former to transverse and longitudinal weakened-plane joints

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- Supply and application of any concrete primer
- Mixing, transporting, placing and finishing of the acrylic epoxy grout including formwork where required
- Reforming joints as required
- Texturing, curing and surface protection
- Disposal of surplus material and cleaning up
- Sampling and testing

Item	Unit
B76.07 Spall repairs to joints in existing pavement (width indicated)	metre (m)

The unit of measurement shall be the linear metre of joint repaired in accordance with the Specifications and Drawing and the quantity shall be the summation of individual lengths measured along the line of the joint. The width shall be width of seal as measured after routing.

The tendered rate shall include full compensation for:

- Provision of all plant and materials
- Saw cutting or routing
- Cleaning
- Application of primer if required
- Installation of backing strip where required
- Installation of silicone sealant
- Bevelling of concrete edges
- Disposal of surplus material and cleaning up

Item	Unit
B76.08 Repair subbase using lean mix concrete.....	cubic meter (m³)

The unit of measurement cubic meters of lean mix concrete supplied and placed. The tendered rate shall include full compensation for:

- Procuring, furnishing and storage of all materials
- Provision of all plant
- Preparing subgrade including cleaning out
- Determination of mix proportions
- Mixing, transporting, placing and finishing of the concrete, including formwork were required
- Curing and surface protection
- Disposal of surplus material and cleaning up
- Sampling and testing

C3.6.23 SECTION 8100 : TESTING MATERIALS AND WORKMANSHIP**B8105 TESTING THE AGGREGATES**

ADD THE FOLLOWING SUBCLAUSES:

(h) Ethylene Glycol Weathering Test for durability of aggregates used in seals and asphalt

- (i) Select 100 number single sized chippings from a representative sample retained on the 13,2 mm sieve but passing the 19 mm sieve. The selected aggregate chippings shall be oven dried for 12 hours and the mass of the chippings shall then be determined to the nearest 0,001 kilogram. The chippings shall then be immersed in ethylene glycol contained in a glass container for 28 days. After 28 days the chippings shall be removed from the ethylene glycol and oven dried for 12 hours. All friable and loose pieces shall then forcibly be removed by fingers from the chippings. The mass of the chippings shall then be determined and the percentage weathering loss shall be calculated from the results.
- (ii) Acceptance Criteria

Only aggregate that shows a breakdown after 26 days in ethylene glycol of less than 2% shall be used in seals or in asphalt."

B8117 MEASUREMENT AND PAYMENT

Item	Unit
B81.02	Other special tests requested by the Engineer:
(a) Cost of testing	Provisional Sum (Prov Sum)
(b) Handling costs and profit in respect	
of subitem B81.02(a) above.....	percentage (%)

The provisional sum provided to cover the cost of special tests as requested by the Engineer in terms of Clause 8115 shall be expended in accordance with the provisions of the General Conditions of Contract. Payment will not be made for any special test should the test indicate that the specifications have not been complied with. Tests required for mix design shall also not be classified as special tests.

The percentage tendered is a percentage of the amount actually spent under subitem B81.02(a), which shall include full compensation for the handling costs of the Contractor and the profit in connection with the tests requested by the Engineer.

Item	Unit
B81.03 Providing testing equipment and/or doing the following tests:	
(b) Core drill	Number of tests / equipment specified
(c) Profilometer	Number of tests / equipment specified
(d) Grip tester (surface friction, 1.0 mm	

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water film, at 65 km/hr and 95 km/hr
on 3.0 m left and right of centerline) Number of tests / equipment
.....specified

The unit of measurement for sub-item B81.03 (c) shall be the number of times the particular piece of equipment is established and de-established on site to perform acceptance control measurements, as approved by the engineer.

The tendered rate for sub-item B81.03 (c) shall include full compensation for providing and establishing the equipment on site, and for the subsequent de- establishment and removal of the equipment from site when no longer required.

The tendered rate shall include full compensation for surveying the specified layer, and for analysing and determining the longitudinal profiles and 100 m International Roughness Index (IRI), all as specified in sub-clauses B4213 (a) (v) of the specification. The tendered rate must also include full compensation for the number of runs per lane specified.

The Contractor shall appoint a reputable and accredited company to perform the applicable tests as specified. This company is subject to the Engineer's approval and his approval must be obtained before any test results will be evaluated.

C3.6.24 SECTION 8200: QUALITY CONTROL (SCHEME 1)**B 8201 SCOPE**

Add the following paragraph:

"Quality Control Scheme 1 as specified in section 8200 shall apply to this contract."

B8304 LOT SIZES**(a) Determining the lot size**

(i) Road construction layers

ADD THE FOLLOWING TO THE LAST PARAGRAPH:

The Contractor's process control tests and results shall adhere to the test frequencies and intervals for various layers as presented in Tables B8204/A1 to A5. TABLE B8204/A1 FILL

LAYER TEST REQUIREMENTS AND LOT SIZES

Test	Sample from	Minimum frequency (lot size)	Use results for
In-situ density	Completed layer	Minimum 4 tests on day's work or 1 per 500m ³	Ensure compliance
Maximum dry density	Completed layer	Minimum 1 per lot	In-situ density
CBR	Windrow after mixing but before final compaction	Minimum 1 per lot	Ensure compliance
Indicator tests	Windrow after mixing but before final compaction	Minimum 1 per lot	Ensure compliance
Visual inspection	Previous day's work	Daily	Ensure compliance
Finished levels	Previous day's work	Daily	Ensure compliance

TABLE B8204/A2 SELECTED LAYER TEST REQUIREMENTS AND LOT SIZES

Test	Sample from	Minimum frequency (lot size)	Use results for
In-situ density	Completed layer	Minimum 6 tests on day's work or 1 per 225m ³	Ensure compliance
Maximum dry density	Completed layer	Minimum 1 per lot or 1 per every 4 in-situ density tests	In-situ density
CBR	Windrow after mixing but before final compaction	Minimum 1 per lot or 1 per every 4 in-situ density tests	Ensure compliance
Indicator tests	Windrow after mixing but before final compaction	Minimum 1 per lot	Ensure compliance
Visual inspection	Previous day's	Daily	Ensure

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Test	Sample from	Minimum frequency (lot size)	Use results for
	work		compliance
Finished levels	Previous day's work	Daily	Ensure compliance

TABLE B8204/A3 STABILISED LAYER TEST REQUIREMENTS AND LOT SIZES

Test	Sample from	Minimum frequency (lot size)	Use results for
In-situ density	Completed layer	Minimum 6 tests on day's work or 1 per 225m ³	Ensure compliance
Maximum dry density	Completed layer	Minimum 2 per lot or 1 per every 4 in-situ density tests	In-situ density
Indicator tests	Windrow after mixing but before final compaction	Minimum 2 per lot or 1 per 225m ³	Ensure compliance
UCS	Windrow after mixing but before final compaction	Minimum 2 per lot or 1 per 750m ³	Ensure compliance
Visual inspection	Previous day's work	Daily	Ensure compliance
Finished levels	Previous day's work	Daily	Ensure compliance

TABLE B8204/A4 CRUSHED STONE BASE TEST REQUIREMENTS AND LOT SIZES

Test	Sample from	Minimum frequency (lot size)	Use results for
In-situ density	Completed layer	Minimum 6 tests on day's work or 1 per 225m ³	Ensure compliance
Bulk relative density	Completed layer	Minimum 2 per lot or 1 per every 4 in-situ density tests	In-situ density
Indicator tests	Windrow after mixing but before final compaction	Minimum 2 per lot or 1 per 225m ³	Ensure compliance
Grading	Windrow after mixing but before final compaction	Minimum 2 per lot or 1 per 225m ³	Ensure compliance
ACV	Windrow after mixing but before final compaction	1 per 3 000m ³	Ensure compliance
Flakiness	Windrow after mixing but before final compaction	1 per 3 000m ³	Ensure compliance
Visual inspection	Previous day's work	Daily	Ensure compliance
Finished levels	Previous day's work	Daily	Ensure compliance

TABLE B8204/A5 ASPHALT SURFACING TEST REQUIREMENTS AND LOT SIZES

Test	Sample from	Minimum frequency (lot size)	Use results for
Aggregate grading, sieve analysis	Stockpile	Minimum of 4 per lot or 1 per 1 000m ³	Compliance
Aggregate shape, flakiness index	Stockpile	Minimum of 4 per lot or 1 per 1 000m ³	Compliance
Aggregate resistance to crushing. ACV, 10% Fact (wet and dry)	Stockpile	Minimum of 4 per lot or 1 per 5 000m ³	Compliance
Sand equivalent in fine aggregate	Stockpile	Minimum of 4 per lot or 1 per 2 000m ³	Compliance
Polishing stone value (PSV)	Stockpile	1 per source	Compliance
Aggregate adhesion	Stockpile	Minimum of 4 per lot or 1 per 5 000m ³	Compliance
Aggregate absorption	Stockpile	Minimum of 4 per lot or 1 per 5 000m ³	Compliance
Plasticity of fines (Plasticity index)	Stockpile	Minimum of 4 per lot or 1 per 2 000m ³	Compliance
Durability, methylene blue test	Stockpile	1 per source	Compliance
Analysis of hot mix: - Binder content - Aggregate/filler proportion - Grading	Paving train	Minimum of 6 per days work or 1 test per 200 ton for each mix type. whichever is highest	Show comparison with the approved grading curve of the approved production mix
Sand equivalent	Paving train	1 per week or 1 per 5000 tons whichever is highest	Ensure mix complies with approved mix
Stability Flow Bulk density MTRD (Rice's method) Voids ITS	Paving train	Minimum of 2 per days work or 1 test per 500 ton for each mix type. whichever is highest	Comparison of mean results from twin specimens with approved production mix and permitted variation
Temperature at delivery	Truck	Each load	Check for compliance
Wind speed & air temperature	n/a	Whenever laying is planned. Check and record every 2 hours	Check suitability of weather conditions
Surface accuracy	Previous day's work	Daily	Ensure compliance
Finished levels			
Core samples	Previous day's work	Cores as follows: <ul style="list-style-type: none"> Minimum of 6 per days work or 1 test per for every 2000m² laid for each mix type Adjacent to longitudinal joints at not more than 150m intervals At locations on transverse joints as requested by 	Ensure compliance
Course thickness			
Bulk density			
MTRD (Rice's method)			
Air voids content			

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		Engineer	
Recovered binder penetration	Previous week's work	Weekly, locations requested by Engineer	To ensure binder degradation does not take place in mixing plant

B 8206 JUDGEMENT PLAN B

Notes (Table 8206/3)

Replace note 1(a) with the following:

"(a) Density $L_s=93\%$ of theoretical relative maximum density for all base and wearing course layers (Rice's density, see also clause B4210)."

To note 1(b) add "Non-homogeneous modified binders" to the first sentence and delete the third to fifth paragraphs from the sentence "For gap graded mixes, slurry seals and non-homogeneous modified binders."

Change this specification to read:

"Binder variations to be 0.3% (by mass) for all mixes."

Replace note 1(c) with the following:

"Voids

L_s = specified values - 1 percentage points

L_s = specified values + 1 percentage points"

C3.7: Generic Specifications

The Specifications herein are Specifications prepared by the employer applicable to this contract. Three Specifications are included:

C3.7.1: OCCUPATIONAL HEALTH AND SAFETY SPECIFICATIONS	C3-119
C3.7.2: ENVIRONMENTAL WORK INSTRUCTIONS.....	C3-186
C3.7.3: REQUIREMENTS OF GOVERNMENT'S PROGRAMME FOR BROAD- BASED BLACK EMPOWERMENT.....	C3-209

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C3.7.1: OCCUPATIONAL HEALTH AND SAFETY SPECIFICATIONS

This part of the Specifications contains comprehensive occupational health and safety specifications.

LIST OF ABBREVIATIONS

(ACSA)	Airports Company South Africa
AIA	Approved Inspection Authority
BoQ	Bill of Quantities
CC	Compensation Commissioner
CHS	Construction Health and Safety
CR	Construction Regulations (Gazette 10113 of 7/02/2014)
DMR	Driven Machinery Regulations
DoL	Department of Labour
GAR	General Administration Regulations
GSR	General Safety Regulations
HIRA	Hazard Identification Risk Assessment
H&S	Health and Safety
OH	Occupational Health
OHS	Occupational Health and Safety
OHSA	Occupational Health and Safety Act No. 85 of 1993 (as amended)
OHSS	Occupational Health and Safety Specification
PC	Principal Contractor
PPE	Personal Protective Equipment
ER	Engineer's Representative
RHCS	Regulations for Hazardous Chemical Substances
SACPCMP	South African Council for the Project and Construction Management
Professions	
SANS	South African National Standards (Authority)
SMME	Small, Micro, Medium Enterprise
SSHSS	Site Specific Health and Safety Specification

1. INTRODUCTION**1.1 Purpose of the Occupational Health and Safety Specification**

The purpose of the OHSS is to assist Contractors to achieve compliance with the Occupational Health and Safety law, in order to reduce incidents and injuries. The OHSS will be implemented during the construction of this project or any construction activity that the Employer has control over.

The OHSS is a performance specification to ensure that the Employer and any bodies that enter into formal agreements with the Employer viz. Agents, Consultants and Contractors achieve an acceptable level of OHS performance. No advice, approval of any document required by the OHSS such as hazard identification and risk assessment action plan or any other form of communication from the Employer shall be construed as an acceptance by the Employer of any obligation that absolves the Contractor from achieving the required level of performance and compliance with legal requirements. Further, there is no acceptance of liability by the Employer which may result from the Contractor failing to comply with the OHSS, i.e. the Contractor remains responsible for achieving the required performance levels.

1.2 Implementation of the Occupational Health and Safety Specification

This SSHSS is intended for use with **Construction of runway access roads and turning ear at East London Airport.**

Contract	C3 - 118	C3.7
Part C3: Scope of works Reference		Specifications
No. ELS5837/2018/RFP	Occupational Health and Safety Specification	

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This OHSS forms an integral part of the Contract, and Contractors are required to make it an integral part of their Contracts with Sub-Contractors and Suppliers. It will be disseminated by the Employer to persons responsible for the design of the infrastructure works, who will ensure that it is included in the Tender Document(s) issued to prospective Contractors. The prospective Contractors shall incorporate the requirements of the OHSS in their submission of tenders to the Employer.

This specification must be read in conjunction with the OHS Act No 85 of 1993 (as amended), the Construction Regulations as published in Government Regulation Notice No GNR 84 of 7 February 2014 as well as all regulations governed by the OHSA as amended.

The OHS Act Agreement in this document (Returnable Schedules) must be fully completed by the Contractor.

KEY ROLE PLAYERS

Client	Airports Company South Africa
Contact:	Dupie du Plessis
Contact Number:	+27 507 7348
Email address:	Dupie.duPlessis@airports.co.za

Principal Agent	ACSA
Contact	Cornelius du Plessis
Contact Number:	(041) 507 7378
Email address:	Dupie.duPlessis@airports.co.za

Health & Safety Agent	TBC
Contact	
Contact Number:	
Email address:	

2. STANDARD OCCUPATIONAL HEALTH AND SAFETY SPECIFICATION

2.1 Scope

This OHS covers the requirements for eliminating and mitigating incidents and injuries in all Employer controlled projects.

The scope also addresses legal compliance, hazard identification and risk control, promoting a health and safety culture amongst those working on Airports Company South Africa (ACSA) projects and those affected by the activities taking place in and around them.

2.2 Interpretations

2.2.1 Application

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The OHS contains clauses that are generally applicable to building / construction and that impose pro-active controls associated with activities that impact on human health and safety as they relate to plant and machinery.

Compliance to the requirements of the OHSA, Construction regulations and General Safety Regulations is in addition to the requirements of the OHSS and is part of the Contractor's responsibility. The Employer will through its Agents, as appointed, monitor that the Contractor complies with the requirements of the OHSA and will not prescribe to the Contractor how such compliance is achieved.

Definitions

The definitions used will be those set out in the Government Regulation Notice No 84 of 7 February 2014 with the following addition:

(ACSA): Airports Company South Africa

Occupational Health and Safety Agent (OHS Agent): A person appointed by the Client to carry out the duties of the Client in respect of Occupational Health and Safety on the Project in terms of Regulation 5 sub regs (5) and / or (6)

Hazard Identification and Risk Assessment and Risk Control:

Means a documented plan, which identifies hazards, assesses the risks and details the control measures and safe working procedures which are to be used to mitigate and control the occurrence of hazards and risks during construction or operation phases.

Health and Safety Management Plan:

Means a documented plan which addresses the hazards identified and include safe working procedures to mitigate, reduce or control the hazards identified.

Induction Training:

Means once off introductory training on general health and safety issues given to all employees before commencement of work on site. An abbreviated version should be given to all visitors.

Risk:

Means the probability or likelihood that a hazard can result in injury or damage.

Site:

Means the area in the possession of the Contractor for the construction of the works. Where there is no demarcated boundary it will include all adjacent areas, which are reasonably required for the activities for the Contractor, and approved for such use by the Engineer.

The Act:

Means, unless the context indicates otherwise, the Occupational Health and Safety Act, 1993 (ACT NO. 85 of 1993) and Regulations promulgated there under.

Contractor:

The Contractor terminology used in these specifications shall be deemed to cover Principle Contractor, Contractors and Sub-Contractors.

3. REQUIREMENTS AT TENDER STAGE

The Contractor shall make available the following with his completed tender:

A Preliminary Health and Safety Plan as described in Regulation 5 of the Construction Regulations. The Safety Plan must be based on the Construction Regulations 2014 and this specification and will be subject to approval by the Employer. No work may be started on site until this approval has been given.

Contract	C3 - 120	C3.7
Part C3: Scope of works Reference		Specifications
No. ELS5837/2018/RFP	Occupational Health and Safety Specification	

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This will include a Hazard Identification and Risk Assessment appropriate to the project, expansion of Annexure D, and a declaration to the effect that he has the competence, completion of Occupational Health and Safety Questionnaire, and necessary resources to carry out the work safely in compliance with the OHSA and its Regulations (as amended), especially the Construction Regulations 2014.

Failure to submit the foregoing with his tender, will lead to the conclusion that the Contractor is not able to carry out the work under the contract safely in accordance with the Construction Regulations and may result in the tender being disqualified.

4. APPLICATION FOR A CONSTRUCTION WORK PERMIT

This project has an estimated value in excess of R 40 million. The Client (airports Company South Africa (ACSA)) must acquire a "Construction Work Permit" from the Department of Labour as per CR3.

Work may not commence without the "Application for a Permit to do Construction Work" form being completed by Airports Company South Africa (ACSA) and accepted by the Department of Labour. This includes, inter alia, the Contractor's Health and Safety Plan as accepted by Airports Company South Africa (ACSA).

It should be noted that this OHSS in no way relieves the Contractor of any of his responsibilities set out in the Act and Regulations.

The Principal Contractor will ensure that the Site-Specific number is conspicuously displayed at the main entrance of the site for which that number is assigned.

5. GUIDELINES FOR THE DEVELOPMENT OF A HEALTH & SAFETY PLAN

5.1 Background

In terms of the Construction Regulations [Regulation 5 (1) (a)] to the Occupational Health and Safety Act, No 85 of 1993, the Client is required to compile an Occupational Health and Safety specification for each of its projects and the Contractor, appointed by the Client in terms of Regulation 5 (1) (k), is required to prepare an Occupational Health and Safety Plan. This plan has to be prepared in terms of Regulation 7 1 (a) as well as the this Occupational Health & Safety Specification. In terms of Regulation 5 (1 (f)), the Client and the Contractor are required to agree on the Occupational Health and Safety Plan which must be approved by the Client before any work may commence.

5.2 Framework for an Occupational Health and Safety Plan

5.2.1 Introduction

The Contractor has to demonstrate to the Client that he has a suitable and sufficiently documented Occupational Health and Safety Plan as well as the necessary competencies, experience and resources to perform the construction work safely. The Contractor is required to submit, the following documentation for perusal and verification by the Client:

- Management Structure including an organogram - Tender Stage
- Quality Plan - Tender Stage
- Human Resources Plan - Tender Stage
- Registered Workplace Skills Plan

- Valid "Letter of good standing" from the Compensation Commissioner or licensed compensation insurer - Tender Stage
- Proof of induction and other training of employees
- Example copies of minutes of previous Occupational Health and Safety Committee meetings and copies of Incident Investigation Reports

5.2.2 Contents of an Occupational Health and Safety Plan

The Occupational Health and Safety Plan shall include the following:

5.2.2.1 Occupational Health and Safety Management Programme

- Management of Occupational Health and Safety risks
- Occupational Health and Safety structures and appointments
- Programme of Occupational Health and Safety inspections
- Occupational Health and Safety Representatives
- Occupational Health and Safety committee

5.2.2.2 Statement Regarding the Communication and Management of the Work

- Management structure and responsibilities
- Occupational Health and Safety objectives for the project and arrangements for monitoring and review of Occupational Health and Safety performance
- Arrangements for regular liaison between parties on site
- Consultation with the workforce
- The exchange of design information between the Client, Engineer, supervisors and subcontractors on site
- Handling design changes during the project
- Selection and control of subcontractors
- The exchange of Occupational Health and Safety information between all subcontractors
- Security
- Site induction and on-site training
- Facilities and first-aid
- The reporting and investigation of accidents and incidents
- The production and approval of risk assessments and method statements
- Site Occupational Health and Safety rules
- Fire and emergency procedures
- Reporting to the Client i.e. results of Occupational Health and Safety inspections.
- Incident investigations and committee meetings
- Reporting of incidents to the Department of Labour and Compensation Commissioner where appropriate

6. APPOINTMENT OF COMPETENT SITE PERSONNEL

The CEO (OHSA S16.1) of the PC will take overall responsibility for the appointment of competent site staff for the duration of the project. Should the CEO not be personally involved in the project, the H&S responsibilities are to be delegated to the Site Agent (OHSA 16.2). Knowledge and training in H&S is required, and certificates indicating H&S training as well as experience to be included in CVs.

All other legal appointments are to be made with relevance to the type of work required and kept current with the project programme. The construction team is to ensure the appointed CHS Officer is kept up to date with all planned activities, to ensure all H&S requirements are met.

All construction/technical method statements are to be generated by senior site personnel, and the appropriate risk assessments developed therefrom in conjunction with the CHS Officer.

The Occupational Health and Safety Plan shall include the following, but is not limited to the following key appointments:

6.1 Construction Supervision

Competent Construction Managers (CR8.1) will be appointed to manage part or all of the works and have training and/or experience in the area of responsibility. All site supervisors must show evidence of appropriate training in H&S, and an understanding or training in areas of responsibility (i.e. risk assessments, method statements etc.).

Multiple competent Assistant Construction Managers (CR8.2) may be appointed where justified by the scope and complexity of the works.

Curriculum Vitae (CVs) are to be submitted for approval by the Designer, and/or Client. The Supervisor will be held responsible for the safety of working teams and subordinates, housekeeping and stacking and storage of materials.

6.2 Construction Health and Safety Officer

The PC will employ at least one competent, full-time CHS Officer (CR8.5) for the duration of the contract. The CHS Officer's CV is to be submitted for approval by the CHS Agent or the Client, at time of tender. The PC is to ensure adequate resources are provided in order to undertake all responsibilities (i.e. mobile phone, computer and internet access, vehicle etc.) Qualifications shall include at least Grade 12 SAMTRAC/NEBOSH/Diploma in H&S qualifications or similar, with exposure to civil engineering and building that is appropriate given the level of project complexity preferably in an OHS capacity. He should also have undergone training in the Act and Regulations. In the case of a contract where contractors are employed, the CHS Officer must have a competence to evaluate the Contractors Health and Safety plans.

If proof of registration as a Construction Health and Safety Officer with SACPCMP is supplied, the above requirements will not be required.

This person may not hold any other position on the site staff. The site supervisor may not act as the CHS Officer.

The CHS Officer/s will be held responsible for all H&S on the project.

- Senior site staff and supervision, Contractors are to follow systems, instructions etc. given by the CHS Officer at all times;
- No new workers or Contractors may commence work without approval or following the H&S plan as submitted, and
- No inductions of Contractor staff until the H&S documentation is approved by the CHS Officer.
- The CHS Officer/s may not be removed or replaced without the approval of the CHS Agent, nor may the site be left unattended for more than 1 day without adequate, competent cover.

A monthly report of all H&S activities and incidents is required by the end of the first week of each month, or at a date agreed to by the CHS Agent/Client and the CHS Officer.

The CHS Officer will be responsible for collating the H&S documentation at the close out of the project in electronic format. The PC is to ensure that all Contractors documentation follows the same requirements and closed out H&S documentation must be completed and be available with the close out of the main contract.

Failure to do so will be considered a serious offence and penalties applied.

6.3 Health and safety representatives

In terms of Sections 17 and 18 of the Act (OHS Act 1993) the Contractor shall appoint, in writing, a health and safety representative whenever he has more than 20 employees in his employ on the works. The health and safety representative must be selected from employees who are employed in a full-time capacity at a specific workplace.

The number of health and safety representatives for a workplace shall be at least one for every 50 employees.

The function of the health and safety representative(s) will be to review the effectiveness of health and safety measures, to identify potential hazards and major incidents, to examine causes of incidents (in collaboration with his employer, the Contractor), to investigate complaints by employees relating to health and safety at work, to make representations to the employer (Contractor) or inspector on general matters affecting the health and safety of employees, to inspect the workplace, plant, machinery etc. on a regular basis, to participate in consultations with inspectors and to attend meetings of the health and safety committee.

6.4 Health and safety committee

In terms of Sections 17, 18 and 19 of the Act (OHS Act 1993) the Contractor (as employer), shall establish one or more health and safety committee(s) where there are two or more health and safety representatives at a workplace. The persons selected by the Contractor to serve on the committee shall be designated in writing.

The function of the health and safety committee shall be to hold meetings at regular intervals, but at least once every three months, to review the health and safety measures on the contract, to discuss incidents related to health and safety with the Contractor's representative and any Department of Labour inspector, and to make recommendations regarding health and safety to the Contractor and to keep record of meetings, recommendations and reports made by the committee.

6.5 Competent persons

In accordance with the Construction Regulations the Contractor shall appoint, in writing, competent persons responsible for supervising construction work for the following work situations that may be expected on the site of the works, as applicable to the project.

- Risk assessment (Regulation 9);
- Fall protection (Regulation 10);
- Excavation work (Regulation 13);
- Demolition work (Regulation 14);
- Bulk Mixing Plant operations (Regulation 20);
- Explosive powered tools (Regulation 21)
- Construction vehicle and mobile plant (Regulation 23);
- Use of temporary storage of flammable liquids on construction site (Regulation 25);
- Housekeeping on construction sites (Regulation 27)
- Stacking and storage on construction sites (Regulation 28);
- Fire precautions on construction sites (Regulation 29);
- Construction welfare facilities (Regulation 30).
- In addition a competent person must be appointed for the control of asphalt and concrete surfacing work

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A competent person may be appointed for more than one part of the construction work with the understanding that the person must be suitably qualified and able to supervise at the same time the construction work on all the work situations for which he has been appointed.

CVs of all appointed persons should be submitted together with proof of the appointment

The appointment of competent persons to supervise parts of the construction work does not relieve the Contractor from any of his responsibilities to comply with all requirements of the OHS Act and Regulations.

7. PROJECT / SITE SPECIFIC REQUIREMENTS

A list of activities and considerations that have been identified for the project and the construction site and for which Risk Assessments, Standard Working Procedures (SWP), management and control measures and Method Statements (where necessary) have to be developed by the Principal Contractor. This list is not to be considered as inclusive and other items must be added as required

In addition, the following risks should be taken into account. The following is a generic list of a Risk Assessment and Site specific health and safety specifications prepared by the Employer in terms of Construction Regulations 5(1)(a) and 5(1)(f):

- Clearing and grubbing of the area/site
- Site establishment including:
 - - Office/s
 - - Secure/safe storage for materials, plant and equipment
 - - Ablutions
 - - Sheltered eating area
 - - Maintenance workshop
 - - Vehicle access to the site
 - - Temporary fuel storage, where applicable
- Dealing with existing structures - possibility of asbestos
- Location of existing services e.g. gas, telecommunications, electrical supply and similar
- Installation and maintenance of temporary construction electrical supply, lighting and equipment
- Adjacent land uses/surrounding property exposures
- Boundary and access control/public liability exposures (NB: the Contractor is also responsible for the OH&S of non-employees affected by his work activities.)
- Health risks arising from neighbouring as well as own activities and from the environment e.g. threats by dogs, bees, snakes and lightning
- Exposure to noise
- Exposure to vibration
- Protection against dehydration and heat exhaustion
- Protection from wet and cold conditions
- Dealing with HIV/Aids and other diseases such as silicosis or asbestos, where applicable
- Use of portable electrical equipment including
 - - Angle grinder
 - - Electrical drilling machine
 - - Circular saw
 - - Generator
- Excavations including
 - - Ground/soil conditions

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- - Trenching
 - - Shoring
 - - Drainage of trenches
- Welding including
 - - Arc welding
 - - Gas welding
 - - Flame cutting
 - - Use of LP gas torches and appliances
- Loading and off-loading of trucks
- Aggregate/sand and other materials delivery
- Manual and mechanical handling
- Lifting and lowering operations
- Driving and operation of construction vehicles and mobile plant including
 - Trenching machine
- - Excavator
- - Bomag roller
- - Milling machine
- - Paving machine
- - Plate compactor
- - Front end loader
- - Mobile cranes and the ancillary lifting tackle
- - Grader
- - Parking of vehicles and mobile plant
- - Towing of vehicles and mobile plant
- - Concrete/asphalt saw
- Use and storage of flammable liquids and other hazardous substances e.g. petrol, diesel, cement, asphalt, bituminous materials and similar
- Layering and bedding
- Installation of pipes in trenches
- Pressure testing of pipelines
- Backfilling of trenches
- Protection against flooding
- Gabion work
- Use of explosives
- Protection from overhead power lines (high and low)
- Work at an operational airport
- Work adjacent to or in proximity of railway lines
- Work adjacent to or in proximity of traffic including aircraft, ground handling equipment, fire trucks
- Working at heights
- Working in confined spaces - tunnelling
- Formwork and support work (temporary works) including scaffolding
- Demolition work, where applicable
- Bulk mixing plant, where applicable
- Environmental impacts such as pollution of water, air or soil
- Working at night

Emergency Procedures

Contract
Part C3: Scope of works Reference
No. ELS5837/2018/RFP

C3 - 126

C3.7
Specifications
Occupational Health and Safety Specification

Confidential

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The Principal Contractor shall submit a detailed Emergency Procedure for approval by the Client prior to commencement on site. The procedure shall detail the response plan including the following key elements:

- List of key competent personnel
- Details of emergency services
- Actions or steps to be taken in the event of the specific types of emergencies
- Information on hazardous material/situations.

Emergency procedure(s) shall include, but shall not be limited to, fire, spills, accidents to employees, use of hazardous substances, bomb threats, major incidents/accidents, civil unrest. etc. The Principal Contractor shall advise the Client, Agent, Engineer and all relevant authorities forthwith, of any emergencies, together with a record of action taken. This shall be confirmed in writing as soon as possible after the incident. A contact list of all service providers (Fire Department, Ambulance, Police, Medical and Hospital, etc) must be maintained and available to site personnel. These procedures shall form part of the Health and Safety Plan.

First Aid Boxes and First Aid Equipment

The Principal Contractor and all Contractors shall appoint in writing First Aider(s). If not already accredited, the appointed First Aider(s) are to be sent for accredited first aid training. Valid certificates are to be kept on site. The Principal Contractor shall provide an on-site First Aid Station with first aid facilities, including first aid boxes containing, at least, the requirements of the Annexure to Section 3 of the General Safety Regulations. All Contractors with more than 5 employees shall supply their own first aid box. Contractors with more than 10 employees shall have a trained and certified First Aider on site at all times.

Personal Protective Equipment (PPE) and Clothing

The Principal Contractor shall ensure that all workers are issued with, free of charge, and shall wear hard hats, protective footwear and overalls as well as any other necessary PPE as set out in Regulation 2.3 of the General Safety Regulations and required by their duties.

Contractors are encouraged to provide reflective vests for all their staff.

The Principal Contractor and all Contractors shall make provision and keep adequate quantities of SABS approved PPE on site at all times. This shall include necessary safety gear for visitors. The Principal Contractor shall clearly outline procedures to be taken when PPE or Clothing is:

- Lost or stolen
- Worn out or damaged
- Issued to temporary labour or staff.

The above procedure applies to Contractors and their Sub-contractors, as they are all Employers in their own right.

Occupational Health and Safety Signage

The Contractor shall provide adequate on-site OHS signage. This should include but is not limited to: 'no unauthorised entry', 'report to site office', 'site office', 'beware of overhead work', 'hard hat area'. Signage shall be posted up at all entrances to site as well as on site in strategic locations e.g. access routes, stairways, entrances to structures and buildings, scaffolding, and other potential risk areas/operations. These signs shall be in accordance with the requirements of the General Safety Regulations as amended.

Medical Examinations.

All Contractors must ensure that all employees have a valid medical certificate issued in terms of Construction Regulation 7(1)(g). Medicals should be done before the employee commences work

and at yearly intervals thereafter. It is advisable that exit medicals are carried out when an employee leaves.

Note that examinations must be done by an Occupational Health Practitioner and NOT by a General Practitioner.

Night Work

Work at night must be carried out under safe conditions and the work area must be adequately lit by flood lights or other suitable lights. The use of reflective PPE in good condition is mandatory.

Workers must be specifically trained in working at night and the dangers of moving machinery emphasized. The OHS Officer, if not on site, must be on call during these periods.

Noise Risks

All plant from plant hire companies (suppliers) or that of the PC is to be compliant with the Noise Induced Hearing Loss Regulations. Plant identified that has not been tested and marked for noise emissions will result in having to be tested at the Contractors or PCs expense. Failure to do so within a reasonable time period will result in such plant being removed from site.

Works executed after 5pm to 8am weekdays, work over weekends and public holidays shall be agreed with the Principal Agent prior to commencement. Noise to be kept at a minimum during normal working / School hours.

Audiometric testing of all workers is noted as required in the medical surveillance programme for all permanent workers prior to work commencing. Temporary labour working in identified noise areas will require testing if the noise levels are indicated on plant or through processes as greater than 85dB. Audiometry records are to be available in the H&S file.

Suitable SANS approved hearing protective equipment shall be issued and worn. Where several items of construction plant are in operation at or near to each other, the noise zone for the combined plant should be established and suitable hearing protective equipment used within this zone. Failure to do so will be considered a serious offence.

8. HEALTH AND SAFETY FILE

The documentation submitted and approved following the awarding of the contract will be used to form the H&S file. The H&S file is required to be laid out in a logical manner, and documentation filed within the file is to be easily accessible.

The following completed information shall be included (but not be limited to) as part of the index:

- The PSHSS;
- The H&S Plan and the approval by Client;
- Appointment by Client;
- Mandatory agreement with Client;
- Notification of construction work;
- A record of all working drawings, calculations and design where applicable;
- Detailed list of Contractors with contact details, appointments, Mandatories etc., H&S specifications issued;
- Record of Competencies (CVs) and appointments;
- Training Records;
- Permits;
- Method statements;

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- Risk assessments;
- Safe work procedures;
- Emergency and injury management;
- Safety data sheets
- Medical surveillance records;
- Registers; and
- Records of audits, minutes etc.
- Plant lists
- Temporary electrical installations
- Employee records (who is on site)

9. RISK ASSESSMENT

Before commencement of any construction work during the construction period, the Contractor shall have a risk assessment performed and recorded in writing by a competent person. (Refer Regulation 9 of the Construction Regulations 2014).

Risk is a measure of the likelihood that the harm from a particular hazard will be realised, taking into account the possible severity of the harm. Harm to people includes death, injury (permanent or temporary), physical or mental health or any combination thereof. Risk management in health and safety includes the identification of hazards, assessing risks, taking action to eliminate or reduce the risk, monitoring the effectiveness and performing regular reviews of the entire process. The Contractor shall compile method statements to address or handle the following:

- Hazards particulars to the contract
- Identify what could go wrong and how
- Identify the likelihood of this happening
- Identify the persons at risk
- Identify the extent of possible harm
- Eliminating or reducing this risk
- A monitoring plan
- A review plan

Contractors must ensure that all subcontractors conduct risk assessments for their scope of work as well. All risk assessments shall be updated and re-evaluated with any extra works or with any change to the scope of the works.

The risk assessment shall identify and evaluate the risks and hazards that may be expected during the execution of the work under the contract, and it shall include a documented plan of safe work procedures to mitigate, reduce or control the risks and hazards identified.

The risk assessment shall be available on site for inspection by inspectors, Employer, Engineer, subcontractors, employees, trade unions and health and safety committee members, and must be monitored and reviewed periodically by the Contractor.

10. ARRANGEMENTS FOR MONITORING AND REVIEW

The Client and/or Agent will conduct a Monthly, or at greater frequency, H&S audit to audit compliance with Construction Regulations 5.1 (n) and (o) to ensure that the Contractor has implemented and is maintaining the agreed and approved OH&S Plan. Annexure C will be used as format when conducting the audit.

Contract
Part C3: Scope of works Reference
No. ELS5837/2018/RFP

C3 - 129

C3.7
Specifications
Occupational Health and Safety Specification

Confidential

The Client reserves the right to conduct other ad hoc audits and inspections as deemed necessary.

A representative of the Contractor must accompany the Client on all audits and inspections and may conduct his own audit/inspection at the same time. Each party will, however, take responsibility for the results of his own audit/inspection results.

11. MEASUREMENT AND PAYMENT

The payment items for Occupational Health & Safety are contained in the Bill of Quantities. The same rules are applicable in respect of the pricing of these items as for every other payment item. Attention is drawn to the Pricing Instructions in this document.

Item and Unit

C.01 Preparation of Contractor's Project Specific Health and Safety Plan. (Lump Sum (L.S))

The rate for this item must cover all expenses incurred in preparing the Contractor's project specific Health and Safety Plan as required by the Client's project specific Health and Safety Specification in this document

C.02 Principal Contractor's initial obligations in respect of the Occupational Health and Safety Act and Construction Regulations. (Lump Sum (L.S))

The full amount will be paid in one instalment only when the Client's Agent has verified and approved the following

- (a) The Principal Contractor has notified the Provincial Director of the Department of Labour in writing of the project, Annexure A to the Regulations.
- (b) The Principal Contractor has made the required initial Appointments of Employees and Contractors.
- (c) The Client has approved the Principal Contractor's project Health and Safety Plan.
- (d) The Principal Contractor has set up his Health and Safety File.

C.03 Principal Contractor's time related obligations in respect of the Occupational Health and Safety Act and Construction Regulations. (Month (Mth))

The amount shall represent full compensation for that part of the Principal Contractor's general obligations in terms of the Occupational Health and Safety Act and Regulations which are mainly a function of time. Payment will be made when the Client's Agent has verified the Principle Contractor's compliance as part of the audit. This will include the updating and administration of the Health and Safety file.

C.04 Provision of Personal Protective Equipment (PPE) as listed in the Bill of Quantities. (Number (No))

The rates for these items shall include for the procurement, delivery, storage, distribution and all other actions required for the supply of PPE to the employees of the Principle Contractor, full or part time, requiring them. Sub-Contractors are responsible for their own costs in this regard. Any items of PPE not included on the list will be paid for only after the Engineer has agreed to their acquisition.

Items listed will include, among others which may be noted, are: hard hats, reflective vests, reflective bibs, high visibility overalls, protective foot wear, fall arrestor harness and tethers, gloves, ear muffs, earplugs and dust masks of appropriate type. Normal items such as standard

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overalls, waterproof clothing, gum boots and standard workshop safety equipment such as welding masks and goggles will not be paid for.

Payment will be based on the issues register for PPE as kept by the Construction Health and Safety Officer, backed up by paid invoices if requested.

C.05 Provision of part-time or Full Time Construction Health and Safety Officer (Month)

The Tender sum shall include for the cost of a Construction Health and Safety Officer on a fulltime if the Client should allow a part-time CHSO the amount tendered will be prorated according to the amount of time spent on the project.

C.06 Costs of Medical Surveillance (Unit (No))

This item shall cover all costs involved in the obtaining of baseline medical examinations of temporary labour, including operators for mobile plant as contemplated in CR 21(d) (ii); for temporary workers and workers exposed to noises at or above the limits given in the Noise- induced Hearing Loss regulations, as stipulated.

Workers in the permanent employ of the Contractor will only be paid for if their certificates require updating.

C.06 a) Initial (baseline) medical examinations, including audiometric and lung function testing.

C.07 Induction Training (Unit (No))

This item shall cover all costs incurred for the health and safety inductions as set out on Regulation 7 of the Construction regulations and the proof of induction required. Payment will be made on the figures contained in the induction section of the Health and Safety File.

C.08 Provision of First Aid Boxes. (Unit (No))

The rate for this item shall cover all costs incurred in the provision and maintaining of first aid boxes as outlined in Paragraph 7 above.

C.09) Establishment of noise levels (Unit (No))

a) This item shall cover all costs involved in the establishment of noise zones, including any workshops, in terms of Regulation 9 of the Noise-induced Hearing Loss Regulations. Where a zone has previously been established for a particular item of plant within the last two years, the test need not be repeated but must be kept valid for the duration of the Contract.

C.10 Submission of the Health and Safety File. (Lump Sum)

Expenditure under this item shall be made in accordance with the general conditions of contract.

This amount will be paid only once the Principal 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

Contract
Part C3: Scope of works Reference
No. ELS5837/2018/RFP

C3 - 131

C3.7
Specifications
Occupational Health and Safety Specification

Confidential

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I, _____ (name & surname) of _____
(company) Upon receipt of this specification, agree and acknowledge Airports Company South Africa (ACSA)'s
right to impose penalties should I or any of my employees or contractors fail to comply with these conditions.

Signed: _____

On this date: _____ (dd/mm/yyyy)

At: _____ (Airport Name)

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ANNEXURE A CLOSE OUT REQUIREMENTS

The H&S files for the Principal Contractors and all Contractors require closure and handover to the Client at the completion of the project. The following list is an example of what should be included, but is not exhaustive. The OHS Agent or the Client may require further information at the time of completion and the Principal Contractor is to ensure that all instructions are met. Documentation would include all records from the start of the project. Daily or monthly plant inspection records are not required unless they are related to an accident. All records to be in electronic format and submitted to the OHS agent for approval in adequately formatted lists and folders. Layout should be logical and in the same order as in the site files.

Health and Safety close out file requirements include:

- a) Client H&S Specification
- b) Principal Contractor's OHS Plan(s)
- c) Organograms
- d) Legal Appointments
- e) List of all employees employed on a permanent or contractual basis over the duration of the contract
- f) Application for Construction Work Permit to Department of Labour
- g) Letters of Good Standing for the Project
- h) Full files for all Contractors as well as their close out reports
 - List of Contractors
 - All employees employed on a permanent or contractual basis over the duration of the contract
 - Letters of Approval of Contractors
 - Mandatary Agreements
 - Letters of Good Standing
 - Appointments
- i) Incident Records
- j) Non- Conformance records
- k) Agent's Audits
- l) Method Statements
- m) Risk assessments
- n) Safe work procedures
- o) Medical surveillance certificates of fitness. Medical records are to be kept according to the OH&S Act as amended
- p) All drawings for temporary structures (suspended beams/scaffolds etc.)
- q) All operating manuals for any systems that require on-going maintenance
- r) Copies of test results, policies and procedures for environmental monitoring (silica, noise, dusts etc.)

Defect and Liability Period

The H&S files are to be kept 'live' for the defect and liability period by the Principal Contractor, including those of their Contractors. Any work required during the defect and liability period will require an assessment of the H&S file by the OCHS Agent prior to any work commencing.

A copy drawing records for the as-builts are to be placed on file by the Designers once complete.

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**ANNEXURE B
NON-CONFORMANCES**

HEALTH AND SAFETY SITE INSPECTION NON CONFORMANCE NO		
AGENT:		PROJECT:
Consultant:	Date and time:	
Client	Area:	
Contractor:		
ASPECTS NOTED:	COMMENTS:	COMPLETION REQUIRED BY (DATE):
	•	
	•	
	•	
	•	
	•	
PHOTOGRAPHIC EVIDENCE (if available):		
OTHER:		
The following penalties are to be applied:		
Signature of Designer		
Signature of CHS Officer/Site Agent		
Signature: of CHS Agent		

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ANNEXURE C:

CONTRACTORS MONTHLY HEALTH AND SAFETY REPORT

(To be submitted by the end of the first week of each month and be available with each audit)

CONTRACT NUMBER:		PROJECT NAME:	CONTRACT DETAILS:
1	GENERAL ACTIVITIES FOR THE MONTH		
	(detail each area of work)		
2	NUMBER OF WORKERS (permanent and local, contractors)		
3	TRAINING DONE (supplier, no of people, type)		
4	INCIDENTS / ACCIDENT (list number and details, attach reports)		
6	NON-CONFORMANCES (closed out or active)		
7	CONTRACTORS (list, approval status)		
8	AUDITS COMPLETED (internal and external)		
9	CRITICAL ISSUES		
10	GENERAL		

CHS Officer	Signature	Date:
Site Agent	Signature	Date:

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ANNEXURE D

BILL OF QUANTITIES FOR OCCUPATIONAL HEALTH AND SAFETY REQUIRED FOR THE PERMIT APPLICATION WITH THE DEPARTMENT OF LABOUR

ITEM NO	DESCRIPTION	UNIT	QUANTITY	RATE	TOTAL
C.01	Preparation of the Contractor's site-specific Health and Safety Plan	lump sum			
C.02	Principal Contractor's initial obligations in respect of the Occupational Health and Safety Act and Construction Regulations	lump sum			
C.03	Principal Contractor's time related obligations in respect of the Occupational Health and Safety Act and Construction Regulations	month			
C.04	Provision of Personal Protective Equipment (PPE)				
	(a) Reflective vests	No			
	(b) Hard hats	No			
	(c) Protective foot wear	No			
	(d) Earplugs	No			
	(e) Dust masks	No			
	(f) Gloves				
	g) High visibility overalls to SARTSM Chapter 13 Level 3	No			
	(h) Ear Defenders SABS approved	No			
	(i) Overalls	No			
C.05	Provision of a full time Construction Health and Safety Officer	month			

Contract
Part C3: Scope of works Reference
No. ELS5837/2018/RFP

C3 - 136

C3.7
Specifications
Occupational Health and Safety Specification

Confidential

Contract	C3 - 137	C3.7
Part C3: Scope of works Reference		Specifications
No. ELS5837/2018/RFP	Occupational Health and Safety Specification	

ANNEXURE E HAZARDOUS TASK IDENTIFICATION

(The list given is not inclusive and other hazardous tasks may be identified as the construction progresses)

<u>MAIN TASK</u>	<u>SUB TASK</u>
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
	Fire fighting

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	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
	Use of general workshop equipment
	Tyre repair
	Use of jacking and lifting apparatus
HAZADOUS MATERIALS	Petrol

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To be added to as required	Diesel
Materials safety data 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	
Night work	Use of lighting plant and/ other electrical apparatus
To be added by the contractor at tender stage	

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PART B: PROJECT SPECIFIC HEALTH AND SAFETY SPECIFICATIONS

Project Health and Safety Specification

In terms of Construction Regulations 2014

Client

**AIRPORTS COMPANY SOUTH AFRICA
(ACSA)**

Description of Project Works

**CONTRACTOR APPOINTMENT FOR DESIGN AND
CONSTRUCTION OF PAVED ACCESS ROADS TO
RUNWAYS, TURN PAD FOR RUNWAY 24, CONCRETE
APRON REFURBISHMENT AND EXTENSION OF
TAXILANE FOR A PERIOD OF 26 MONTHS AT KING
PHALO AIRPORT**

Project Location

EAST LONDON AIRPORT

Date

AUGUST 2025

PROJECT HEALTH AND SAFETY SPECIFICATION TABLE OF CONTENTS

1. Specific Project Information

- 1.1 Introduction and Definitions
- 1.2 Background to the Health and Safety Specification
- 1.3 Purpose of the Health and Safety Specification
- 1.4 Implementation of the Health and Safety Specification
- 1.5 Project Directory
- 1.6 Project Details
- 1.7 Existing Environment
- 1.8 Available Drawings
- 1.9 Project Health and Safety Requirements
- 1.10 Interface and Restrictions by Client
- 1.11 Safety File Return to Client

2. Further Requirements

- 2.1 Duties of Principal Contractor / Contractor in terms of Construction Regulations 2014
- 2.2 Management and Supervision of Construction Work
- 2.3 Notification of Intention to Commence Construction Work
- 2.4 Construction Work Permit
- 2.5 Assignment of Contractor's Responsible Persons to Manage Health and Safety on Site
- 2.6 Competency for Contractor's Responsible Persons
- 2.7 Compensation of Occupational Injuries Act 130 of 1993 (COIDA)
- 2.8 Occupational Health and Safety Policy
- 2.9 Health and Safety Organogram
- 2.10 Risk Assessments
- 2.11 Health and Safety Representative(s)
- 2.12 Health and Safety Committee
- 2.13 Medical Certificate of Fitness
- 2.14 Health and Safety Training
 - 2.14.1 Induction
 - 2.14.2 Awareness
- 2.15 Competency
- 2.16 General Record Keeping
- 2.17 General Inspection, Monitoring and Reporting
- 2.18 Emergency Procedures
- 2.19 First Aid Box and First Aid Equipment
- 2.20 Accident / Incident Reporting and Investigation
- 2.21 Hazards and Potential Situations
- 2.22 Occupational Health and Safety Signage
- 2.23 Management of Contractors by Principal Contractor
- 2.24 Stacking of Materials
- 2.25 Housekeeping and General Safeguarding on Construction Sites
- 2.26 Construction Vehicles and Mobile Plant
- 2.27 Electrical Installations and Machinery on Construction Sites
- 2.28 Use and Temporary Storage of Flammable Liquids on Construction Sites
- 2.29 Water Environments

Confidential

- 2.30 Fire Precautions on Construction Sites
- 2.31 Construction Employees' Facilities
- 2.32 Fall Protection
- 2.33 Temporary Works
- 2.34 Excavation
- 2.35 Demolition Work
- 2.36 Tunnelling
- 2.37 Scaffolding
- 2.38 Bulk Mixing Plant
- 2.39 Rope Access Work
- 2.40 Hazardous Chemical Substances (HCS)
- 2.41 Noise Induced Hearing Loss
- 2.42 Explosives and Blasting
- 2.43 Personal Protective Equipment (PPE)
- 2.44 Asbestos
- 2.45 Pressure Vessels (Including Gas Bottles)
- 2.46 Fire Extinguishers and Fire Fighting Equipment
- 2.47 Lifting Machinery and Tackle
- 2.48 Ladders and Ladder Work
- 2.49 General Machinery
- 2.50 Portable Electrical Tools
- 2.51 High Voltage Electrical Equipment
- 2.52 Public Health and Safety
- 2.53 Night Work
- 2.54 Environmental Conditions and Flora and Fauna
- 2.55 Occupational Health
- 2.56 Suspended Scaffolds
- 2.57 Material Hoists
- 2.58 Explosive Actuating Fastening Devices

Annexure A

- Task Completion Form

Annexure B

- Contractor's Responsible Persons

Baseline Risk Assessments

Health and Safety Specification Acknowledgement Receipt

1.0 SPECIFIC PROJECT INFORMATION

1.1 INTRODUCTION AND DEFINITIONS

PLEASE NOTE THAT THE REQUIREMENTS OF THE NEW CONSTRUCTION REGULATIONS 2014 HAVE BEEN IN EFFECT SINCE 7TH AUGUST 2014. THE NEW REGULATIONS PLACE ADDITIONAL LEGAL DUTIES UPON PRINCIPAL CONTRACTORS AND CONTRACTORS. ALTHOUGH THIS HEALTH AND SAFETY SPECIFICATION INCLUDES MUCH OF THE CONTENT OF THESE NEW REQUIREMENTS, THE CONTRACTOR WILL BE DEEMED TO BE FAMILIAR WITH THE REQUIREMENTS OF THESE REGULATIONS, AND TO HAVE FACTORED IN ALL THE DUTIES PLACED UPON CONTRACTORS AND PRINCIPAL CONTRACTORS IN THE TENDER. A COPY OF THE REGULATIONS CAN BE VIEWED ON THE DEPARTMENT OF LABOUR'S WEBSITE.

This Health and Safety Specification contains clauses that are generally applicable to construction activities, as well as imposing pro-active controls associated with activities that impact on Health and Safety as it relates to plant and machinery. Compliance to the requirements of the Occupational Health and Safety Act 1993 is in addition to the requirements of this Health and Safety Specification and is part of the Contractor's responsibility. The Client will monitor that the Contractors comply with the requirements of such legislation.

ALL REFERENCES TO CLIENT IN THIS HEALTH AND SAFETY SPECIFICATION ALSO REFER TO CLIENT AGENT, WHERE SO APPOINTED.

Definitions (as per the Construction Regulations 2014) applicable to this Health and Safety Specification:

"agent" means a competent person who acts as a representative for a client;

"angle of repose" means the steepest angle of a surface at which a mass of loose or fragmented material will remain stationary in a pile on the surface, rather than sliding or crumbling away;

"bulk mixing plant" means machinery, appliances or other similar devices that are assembled in such a manner so as to be able to mix materials in bulk for the purposes of using the mixed product for construction work;

"client" means any person for whom construction work is being performed;

"competent person" means a person who has, in respect of the work or task to be performed, the required knowledge, training and experience and, where applicable, qualifications, specific to that work or task: Provided that where appropriate qualifications and training are registered in terms of the provisions of the National Qualification Framework Act, 2000 (Act No.67 of 2000), those qualifications and that training must be regarded as the required qualifications and training; and is familiar with the Act and with the applicable regulations made under the Act;

"construction manager" means a competent person responsible for the management of the physical construction processes and the coordination, administration and management of resources on a construction site;

"construction site" means a work place where construction work is being performed;

"construction supervisor" means a competent person responsible for supervising construction activities on a construction site;

"construction vehicle" means a vehicle used as a means of conveyance for transporting persons or material, or persons and material, on and off the construction site for the purposes of performing construction work;

"construction work" means any work in connection with-

- the construction, erection, alteration, renovation, repair, demolition or dismantling of or addition to a building or any similar structure; or
- the construction, erection, maintenance, demolition or dismantling of any bridge, dam, canal, road, railway, runway, sewer or water reticulation system; or the moving of earth, clearing of land, the making of excavation, piling, or any similar civil engineering structure or type of work ;

"construction work permit" means a document issued in terms of regulation 3; "contractor"

means an employer who performs construction work;

"demolition work" means a method to dismantle, wreck, break, pull down or knock down of a structure or part thereof by way of manual labour, machinery, or the use of explosives;

"design" in relation to any structure, includes drawings, calculations, design details and specifications ;

"designer" means a competent person who-

- prepares a design;
- checks and approves a design;
- arranges for a person at work under his or her control to prepare a design, including an employee of that person where he or she is the employer; or
- designs temporary work, including its components;
- an architect or engineer contributing to, or having overall responsibility for a design;
- a building services engineer designing details for fixed plant;
- a surveyor specifying articles or drawing up specifications;
- a contractor carrying out design work as part of a design and building project; or
- an interior designer, shop-fitter or landscape architect;

"excavation work" means the making of any man-made cavity, trench, pit or depression formed by cutting, digging or scooping;

"explosive actuated fastening device" means a tool that is activated by an explosive charge and that is used for driving bolts, nails and similar objects for the purpose of providing fixing;

"fall arrest equipment" means equipment used to arrest a person in a fall, including personal equipment, a body harness, lanyards, deceleration devices, lifelines or similar equipment;

"fall prevention equipment" means equipment used to prevent persons from falling from a fall risk position, including personal equipment, a body harness, lanyards, lifelines or physical equipment such as guard-rails, screens, barricades, anchorages or similar equipment;

"fall protection plan" means a documented plan, which includes and provides for -

- all risks relating to working from a fall risk position, considering the nature of work undertaken;
- the procedures and methods to be applied in order to eliminate the risk of falling; and
- a rescue plan and procedures;

"fall risk" means any potential exposure to falling either from, off or into;

"health and safety file " means a file, or other record containing the information in writing required by these Regulations;

"health and safety plan" means a site, activity or project specific documented plan in accordance with the client's health and safety specification;

"health and safety specification" means a site, activity or project specific document prepared by the client pertaining to all health and safety requirements related to construction work;

"material hoist" means a hoist used to lower or raise material and equipment, excluding passengers;

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"medical certificate of fitness" means a certificate contemplated in regulation 7(8);

"mobile plant" means any machinery, appliance or other similar device that is able to move independently, and is used for the purpose of performing construction work on a construction site;

"National Building Regulations" means the National Building Regulations made under the National Building Regulations and Building Standards Act, 1977 (Act No. 103 of 1977), and promulgated by Government Notice No. R. 2378 of 30 July 1990, as amended by Government Notices No's R. 432 of 8 March 1991, R. 919 of 30 July 1999 and R. 547 of 30 May 2008;

"person day" means one normal working shift of carrying out construction work by a person on a construction site;

"principal contractor" means an employer appointed by the client to perform construction work;

"Professional Engineer or Professional Certificated Engineer" means a person holding registration as either a Professional Engineer or Professional Certificated Engineer in terms of the Engineering Profession Act, 2000 (Act No. 46 of 2000);

"Professional Technologist" means a person holding registration as a Professional Engineering Technologist in terms of the Engineering Profession Act, 2000;

"provincial director" means the provincial director as defined in regulation 1 of the General Administrative Regulations, 2003;

"scaffold" means a temporary elevated platform and supporting structure used for providing access to and supporting workmen or materials or both;

"shoring" means a system used to support the sides of an excavation and which is intended to prevent the cave-in or the collapse of the sides of an excavation;

"structure" means-

- any building, steel or reinforced concrete structure (not being a building), railway line or siding, bridge, waterworks, reservoir, pipe or pipeline, cable, sewer, sewage works, fixed vessels, road, drainage works, earthworks, dam, wall, mast, tower, tower crane, bulk mixing plant, pylon, surface and underground tanks, earth retaining structure or any structure designed to preserve or alter any natural feature, and any other similar structure;
- any falsework, scaffold or other structure designed or used to provide support or means of access during construction work; or
- any fixed plant in respect of construction work which includes installation, commissioning, decommissioning or dismantling and where any construction work involves a risk of a person falling;

"suspended platform" means a working platform suspended from supports by means of one or more separate ropes from each support ;

"temporary works" means any falsework, formwork, support work, scaffold, shoring or other temporary structure designed to provide support or means of access during construction work;

"the Act" means the Occupational Health and Safety Act , 1993 (Act No. 85 of 1993);

"tunnelling" means the construction of any tunnel beneath the natural surface of the earth for a purpose other than the searching for or winning of a mineral.

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1 Reference should be made to the following documentation in conjunction with this Safety Specification (including existing surveys, drawings and reports):

Tender documents
Drawings
ELC Works documents

IMPORTANT NOTE:

This Health and Safety Specification has been prepared to comply with the requirements of the Construction Regulations 2014.

1.2 BACKGROUND TO THE HEALTH AND SAFETY SPECIFICATION

Historically, the Construction Industry has had a poor health and safety record. Due to the complex and potentially dangerous operations being undertaken, there is a high risk of incidents, accidents and injuries. In many instances poor adherence to the Act and Regulations has resulted in severe consequences for Health and Safety performance. The Client is determined that the highest Health and Safety standards will prevail throughout the Contract and that there will be full commitment from all parties involved.

To achieve this goal the Client has prepared this Health and Safety Specification. The Health and Safety Specification sets out guidelines and minimum levels of awareness and guidance for Health and Safety requirements for the project. Contractual responsibility for adhering to these requirements rests with the Contractors. All employees are encouraged to be pro-active in compliance.

The Client is committed to ensuring the highest Health and Safety standards for all work undertaken within the Contract.

Contractors as employers are fully responsible and accountable for compliance with all Health and Safety requirements.

IMPORTANT NOTE:

Compliance with the Occupational Health and Safety Act and Regulations shall not be limited to this Health and Safety Specification and definitions contained in this document.

Contractors shall be conversant with the requirements and effects of Health and Safety legislation upon their activities, in particular the Construction Regulations, 2014, and the Occupational Health and Safety Act, 1993, and to have made adequate provision in their tender submission to comply with all legislative requirements.

The Contractor's personnel will be responsible for the auditing of the implementation of the Health and Safety Specification and maintaining the document control and record systems associated with the Health and Safety Specification. The Client will conduct Health and Safety audits of the works too.

1.3 PURPOSE OF THE HEALTH AND SAFETY SPECIFICATION

The purpose of this site specific Health and Safety Specification is to comply with legal requirements and to provide health and safety information about specific project risks known by the Client, Designer and Client Agent to be applicable to this project. This document also provides minimum health and safety requirements, standards and expectations that the principal contractor and contractors must adhere to.

The Contractor must take into account all information in this specification and ensure that their tenders include adequate resources and competence to deal with the matters detailed herein so that all relevant contents are dealt with in a way which is in compliance with legislation and the ethical concerns for the

safeguarding of employees, contractors and other persons as well as assets affected by the construction activities.

The Health and Safety Specification will be implemented during construction of the works and any construction activity that the Client has control over.

This will also assist in ensuring that all the costs related to the compliance with Occupational Health Act 85 of 1993 and the Construction Regulations 2014, as well as this Health and Safety Specification, are taken into consideration at Tender stage.

No advice, approval of any document required by the Health and Safety Specification such as hazard identification and risk assessment action plans or any other form shall be construed as an acceptance by the Client of any obligation that absolves the Contractor from achieving the required level of performance and compliance with legal requirements.

Further, there is no acceptance of liability by the Client which may result from the Contractor failing to comply with the Health and Safety legislation as well as Specification unless the Client has issued an instruction to any requirement, i.e. the Contractor remains responsible for achieving the required performance levels.

1.4 IMPLEMENTATION OF THE HEALTH AND SAFETY SPECIFICATION

This Health and Safety Specification forms an integral part of the Contract, and Contractors shall make it an integral part of their Contracts with Sub Contractors and Suppliers. Contractors employed by the Client are to ensure that the provisions of the Health and Safety Specification are applied both on the site and in respect of all off-site activities relating to the project, in particular in transport activities and project dedicated off-site fabrication works and Bulk Mixing Plants.

The Contractor shall enforce the provisions of the Health and Safety Specification amongst all sub contractors and suppliers for the project.

The Contractor shall sign the acknowledgment on the last page of this safety specification that he/she has familiarized him/herself with the content of the Health and Safety Specification and shall comply with all obligations in respect thereof.

The successful Contractor will be required to compile a Health and Safety Plan based on the requirements of the Occupational Health Act 85 of 1993 and these Specifications, which will need to be approved by Client prior to commencement with construction work.

1.4.1 Client Duties

In terms of the Construction Regulations 2014 the Client (or their Agent, where appointed) has legal duties. Where an Agent (refer to "definitions" section of this document) is appointed in terms of this project, these Health and Safety duties assigned will also apply.

All references to "Client" will apply to their appointed "Client Agent", where so appointed, in this Health and Safety Specification.

The Client must:

- Prepare a baseline risk assessment for the construction work
- Prepare a suitable, sufficiently documented and coherent site specific Health and Safety specification for the intended construction work, based on the baseline risk assessment
- Include the health and safety specification in the tender documents
- Ensure that potential principal contractors submitting tenders have made adequate provision for the cost of health and safety measures

- Ensure that the principal contractor to be appointed has the necessary competencies and resources to carry out the construction work safely
- Take reasonable steps to ensure co-operation between all contractors appointed by the client to enable each of those contractors to comply with the regulations as well as specifications
- Ensure, before work commences, that every principal 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)
- Appoint each principal contractor in writing for the project, or part thereof
- Discuss and negotiate with the principal contractor the contents of the principal contractor's safety plan and thereafter finally approve that plan for implementation
- Ensure that a copy of the principal contractor's health and safety plan is implemented and maintained
- Ensure that periodic health and safety audits and document verification are conducted at intervals mutually agreed upon between the principal contractor and any contractor, but at least once every 30 days
- Ensure that a copy of the health and safety audit report is provided to the principal contractor within 7 days after the audit
- Stop any contractor from executing a construction activity which poses a threat to the health and safety of persons which is not in accordance with the principal contractor's health and safety plan for site
- Where changes are brought about to the design or construction work, make sufficient health and safety information and appropriate resources available to the principal contractor to execute the work safely
- Ensure that the health and safety file is kept and maintained by the principal contractor.
- Where the client requires additional work to be performed as a result of a design change or error in construction due to the actions of the client, the client must ensure that sufficient safety information and appropriate additional resources are available to execute the required work safely.
- Where more than one principal contractor is appointed, the client must take reasonable steps to ensure co-operation between all principal contractors and contractors to ensure compliance with the Regulations
- Where the Client has appointed a Client Agent for the project, their details for this project are contained in the Project Directory section of this health and safety specification.

1.4.2 Designer Duties

It must be noted that the Designer also has Health and Safety duties assigned in terms of the Construction Regulations. Where the contractor fulfils a design function in terms of this project (refer to "definitions" section of this document), these duties will also apply. Please refer to Regulation 6 of the Construction Regulations 2014.

Please note that the designer of temporary works must ensure that:

- all temporary works are adequately designed so that it will be capable of supporting all anticipated vertical and lateral loads that may be applied;
- the designs of temporary works are done with close reference to the structural design drawings issued by the contractor, and in the event of any uncertainty consult the contractor;
- all drawings and calculations pertaining to the design of temporary works are kept at the office of the temporary works designer and are made available on request by an inspector; and
- the loads caused by the temporary works and any imposed loads are clearly indicated in the design.

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1.5 PROJECT DIRECTORY		
Project Client	Airports Company South Africa (ACSA) East London Airport Project Manager	Tel: Fax: Cell: e-mail:
Contact Person	TBC	
Construction Health and Safety Agent	TBC	Tel: Fax: Cell: e-mail:
Contact Person		
Consulting Engineer	TBC	Tel: Fax: Cell: e-mail:
Contact Person		

OTHER PARTIES DIRECTORY	
Department of Labour for submission of Annexure 1: Application for Construction Works Permit Will be undertaken by the Clients Health and Safety Agent	Tel: TBC
Telecommunications Company: Airports Company South Africa (ACSA) HOD Maintenance & Engineering Contact Name: TBC	Cell: TBC
Water, Electricity & Gas Company: Airports Company South Africa (ACSA) HOD Maintenance & Engineering Contact Name: TBC	Cell: TBC

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1.6 PROJECT DETAILS**Description of Works**

Works at East London Airport will consist of the following activities:

Runway 03I/21R

- Milling

Updated once scope of work is finalized

- Mill

Anticipated Construction Duration

12 Months (excluding special non-working days)

Provisional Start Date

January 2019

Completion Date

December 2021

1.7 EXISTING ENVIRONMENT**Hazards particular to this project by virtue of location:**

Site is located in East London Airport. Protection of Aviation and site security are of the utmost importance. All necessary preventative measures must be in place to ensure the safety of Aviation, members of the public and airport personnel, including:

- Demarcation: Works area that will be decommissioned during the construction phase must be demarcated with concrete barriers. All demarcation must be FOD approved and minimize dust on site.
- Safety signage that clearly stipulates access routes, PPE that must be used (hardhats, safety shoes, ear and eye protection and high visibility vests) must be displayed.
- Clearly display emergency numbers and procedures
- Extra care must be taken in marking all entrance and exist routes
- No material may be used that is classified as foreign object debris (ex: danger tape)
- Warning signs to be displayed for all Airports Company South Africa (ACSA) approved vehicles – this will include speed reduction and allocated parking areas.

Overhead, Above Ground and Underground Services crossing the site:

Overhead: None that will have an impact on works

Underground: Stormwater drainage systems and electrical cables, runway/taxiway edge lighting and also runway closure crosses

Ground level: None that will have an impact on works

Service Drawings available: Please refer to available drawings

Wayleaves required: None that will have an impact on works

Permits required: All workers to have induction training. Permits must be visible at all times

Isolations required: Please refer to tender documents for all requirements by professional team.

Existing structures and surrounding land use (with a significant impact on Health & Safety):

Site is located within East London Airport. There are existing shops, restaurants, etc in the vicinity. Works area will be located on Airside and runway areas. Extreme care must be taken to follow Airports Company South Africa (ACSA) requirements.

Existing ground conditions and ground survey report:

2 way asphalt road

Existing Traffic Systems

All vehicles to adhere to Airports Company South Africa (ACSA) Airside and security requirements.

Condition: 2 way asphalt road

Restrictions to access: All access will be restricted and indicated by Airports Company South Africa (ACSA). Permits will be compulsory to access to works area. Only approved drivers will be allowed access.

Speed restrictions: Airport speed limits to be followed.

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1.8 AVAILABLE DRAWINGS

Refer to tender documentation.

1.9 PROJECT HEALTH AND SAFETY REQUIREMENTS

Significant health and safety hazards identified by Designer and Client Agent:

Access and Security Permits: No person will be allowed to gain access to airside without the proper induction, training and security clearance. Access permits must be visible at all times. Any person failing to comply will be removed from site.

Safety Signs: All signs must clearly indicate access routes and evacuation procedures. Required personal protective equipment for contractors as well as any other person to be clearly visible.

Demarcation: All Demarcation must be FOD approved. Demarcation must ensure the minimizing of noise and dust on site. All safety signs must be displayed as per OHS Act Regulation and Specification requirements.

Traffic plan and accommodation: Principal contractor to provide a method statement of traffic control with regards to entry and exit of construction vehicles and delivery vehicles. All workers to adhere to Airports Company South Africa (ACSA) Airside traffic rules and regulations at all times.

Working Hours: Extended Contractor Construction hours for work impacting on operations and passenger comfort will be set in accordance with flight schedules and off peak periods. Cartage of waste material from demolition works and deliveries of bulk material will only be allowed during off- peak hours as stipulated. The delivery and erection of unusual loads will be subject to protocols developed to comply with Airports Company South Africa (ACSA) requirements. Penalties will apply for working outside working hours as deemed appropriate by Airports Company South Africa (ACSA).

Other construction hazards expected are as follows:

Asphalting
Cutting Kerbs
Cutting Off Disc
Electric Tools and Electrical Installations
Excavations
Fire
Hand tools
Hazardous Substances
Hot Works
Kerb Laying
Manhole Rings and Pipes Storage Members
of Public
Night Work Noise
and Dust Painting
Paving (Laying)
Plant/Vehicle and Equipment Operation
Road Construction
Road Marking
Road Working – in or next to (inc. Traffic Management)

Underground Services
NOTE: Please refer to end of this Health and Safety Specification for the baseline risk assessment for these risks.
ACTIVITIES REQUIRING APPROVED METHOD STATEMENTS (FOR HEALTH AND SAFETY)
Please note that a method statement will be required for all high risk activities on site. This will include but is not limited to: <ul style="list-style-type: none"> • Rubble removal and environmental control • Delivery of materials to designated areas. • Emergency Evacuation plans and procedures that will follow the Airport procedures • Closures of runways and bus ways must be conducted by ARFF HOD. • FOD Demarcation areas
ACTIVITIES REQUIRING PERMITS (FOR HEALTH AND SAFETY PURPOSES)
Permit to Dig: Daily registers to be completed as required Permit to Enter Excavations: Daily registers to be completed as required Permit to Work with Electricity: Daily registers to be completed as required Confined Space Permit: Not applicable for this project Hot Works Permit: Daily registers to be completed as required Permit to Work under Power Lines: Not applicable for this project Blasting: Not applicable for this project
CONTRACTOR SAFETY OFFICER PROVISION
Records of safety audits undertaken by the Contractor's permanent Safety Officer must be kept on site in the safety file and non-conformances reported by the Safety Officer to the Contractor's management team. All non-conformances identified by the Safety Officer must be investigated and corrective action taken by the Contractor to prevent re-occurrence.
MEDICAL CERTIFICATE OF FITNESS
The contractor must ensure that their employees on site have a valid medical certificate of fitness, specific to the construction work being performed, issued by an occupational health practitioner in the form of an Annexure 3 template of the Construction Regulations..
MANAGEMENT AND SUPERVISION OF CONSTRUCTION WORK
A principal contractor must, in writing, appoint one full-time competent person as the construction manager with the duty of managing all the construction work on a single site, including the duty of ensuring occupational health and safety compliance, and in the absence of the construction manager an alternate must be appointed by the principal contractor.
TRAFFIC MANAGEMENT AND TRAFFIC SAFETY OFFICER PROVISION
Records of safety audits undertaken by the Contractor's permanent Traffic Safety Officer must be kept on site in the safety file and non-conformances reported by the Traffic Safety Officer to the Contractor's management team. All non-conformances identified by the Traffic Safety Officer must be investigated and corrective action taken by the Contractor to prevent re-occurrence.
ENVIRONMENTAL CONDITIONS

Contractor must take into account adverse weather conditions on site activities and implement control measures to mitigate risk. This includes risk of exposure to excessive heat, cold, rain and wind. The open nature of the site works will not preclude any of the above.

ARRANGEMENTS FOR ACCESS, PARKING, DELIVERIES, ETC

Access to site by Construction Vehicles: Only approved drivers with permits will gain access to site camp

Access to site by Construction Workers and Visitors: All visitors to make arrangement prior to visiting site to gain access. All visitors to follow Airports Company South Africa (ACSA) Airside security procedures. Only contractors with permits will be allowed access to site.

ARRANGEMENTS FOR SITE CAMP, ABLUTIONS AND YARD

Site camp location and set up

- | | | | |
|---|---------------------------------------|---|--|
| } | • Restrictions / requirements: | } | Contractor to advise in consultation with Engineer / Professional Team |
| | • Storage areas: | } | |
| | | } | |
| | • Security: | } | |

Ablutions and Welfare Arrangements

Contractor to supply ablutions and facilities in line with the Construction Regulations 2014, refer to section 2.31 of this health and safety specification regarding the below. Please note that toilets should be provided with built in facilities for hand washing:

- | | | |
|------------------------------|---|--|
| • Toilets: | } | Contractor to provide as per Regulations |
| • Washing facilities: | } | |
| • Drinking Water: | } | |
| • Shelter: | } | |
| • Showers: | } | |
| | } | |

PROTECTION OF SITE AGAINST UNAUTHORISED ACCESS BY PUBLIC

Excavation Fencing: Note that excavations accessible to public, or adjacent to public roads / thoroughfares, must have (1) barrier / fence of at least 1m in height, and (2) warning illuminates at night or when visibility is poor, or have other suitable precautionary measures if of both these are not practicable.

General Fencing of Site: Note that construction sites in built up areas adjacent to public way must be fenced off and have controlled access points. All fencing/hoarding must be painted as per Airports Company South Africa (ACSA) requirements and be FOD approved.

Warning Notices: Warning signs must be properly displayed as per requirements. Signs to be FOD approved and properly secured.

PERSONAL PROTECTIVE EQUIPMENT (PPE)

The Client requires the Contractor to ensure that employees (and others under his/her control) wear the following minimum PPE:

Overalls: Yes, all workers must be clearly identifiable

Safety Harnesses: Not applicable to this project.

Hard Hats: Not applicable to this project

Reflective Vests: Yes, all workers must be clearly visible

Safety Footwear: Yes, must be worn at all times

Goggles / gloves / ear defenders / respiratory protection: Yes, must be worn at all times as activity requires

Specialist Equipment (e.g.: for confined Spaces): Yes, must be worn at all times for relevant activities.

HAZARDOUS SUBSTANCES

The following materials and substances have, or may have, to be used in the works and are identified as potentially posing special health and / or safety hazards during the project. Appropriate measures will need to be specified for their control:

Asphalt , Cement, Petrol, Thinners, Diesel,

1.10 INTERFACE AND RESTRICTIONS BY CLIENT

Contractor must note that the following Client activities will continue during construction:

Certain sections will be deactivated during construction and rehabilitation phases. It is of the utmost importance that all workers stay in designated works areas.

The following Client safety rules and/or requirements are to be observed:

All workers are to receive AIT and AVOP induction prior to commencement of work on site. No workers will be allowed on site without his/her induction permit.

Other safety rules and requirements to be advised at induction. Please also refer to tender document.

Restrictions on times, access or other restrictions by Client

Because construction work must be conducted with minimal disruption to airport operations, restrictions may be imposed that will determine the times that work can be conducted and the length of the work shift. Extended Contractor Construction hours for work impacting on operations and passenger comfort will be set in accordance with flight schedules and off peak periods. Cartage of waste material from demolition works and deliveries of bulk material will only be allowed during off- peak hours as stipulated. The delivery and erection of unusual loads will be subject to protocols developed to comply with Airports Company South Africa (ACSA) requirements. Penalties will apply for working outside working hours as deemed appropriate by Airports Company South Africa (ACSA).

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1.11 SAFETY FILE RETURN TO CLIENT

The Safety File for the Project is to be handed over by the Principal Contractor to the Client upon Project Completion in either a hard copy format or on CD.

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2.0 FURTHER REQUIREMENTS

2.1 Duties of Principal Contractor / Contractor in terms of Construction Regulations 2014

A Principal Contractor must:

- provide and demonstrate to the client a suitable, sufficiently documented and coherent site specific health and safety plan, based on the client's documented health and safety specifications, which plan must be applied from the date of commencement of and for the duration of the construction work and which must be reviewed and updated by the principal contractor as work progresses;
 - open and keep on site a health and safety file, which must include all documentation required in terms of the Act and these Regulations, which must be made available on request to an inspector, the client, the client's agent or a contractor; and
 - on appointing any other contractor, in order to ensure compliance with the provisions of the Act
-
- provide contractors who are tendering to perform construction work for the principal contractor, with the relevant sections of the health and safety specifications pertaining to the construction work which has to be performed;
 - ensure that potential contractors submitting tenders have made sufficient provision for health and safety measures during the construction process;
 - ensure that no contractor is appointed to perform construction work unless the principal contractor is reasonably satisfied that the contractor that he or she intends to appoint, has the necessary competencies and resources to perform the construction work safely;
 - ensure prior to work commencing on the site that every 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;
 - appoint each contractor in writing for the part of the project on the construction site;
 - take reasonable steps to ensure that each contractor's health and safety plan is implemented and maintained on the construction site;
 - ensure that the periodic site audits and document verification are conducted at intervals mutually agreed upon between the principal contractor and any contractor, but at least once every 30 days;
 - stop any contractor from executing construction work which is not in accordance with the client's health and safety specifications and the principal contractor's health and safety plan for the site or which poses a threat to the health and safety of persons;
 - where changes are brought about to the design and construction, make available sufficient health and safety information and appropriate resources to the contractor to execute the work safely;
 - discuss and negotiate with the contractor the contents of their health and safety plan and finally approve that plan for implementation;
 - ensure that a copy of both the principal contractor and contractor's health and safety plan is available on request to an employee, an inspector, a contractor, the client or the client's agent;

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- hand over a consolidated health and safety file to the client upon completion of the construction work, to include a record of all drawings, designs, materials used and other similar information concerning the completed structure;
- in addition to the documentation required in the health and safety file include and make available a comprehensive and updated list of all the contractors on site accountable to the principal contractor, the agreements between the parties and the type of work being done;
- ensure that all his or her employees have a valid medical certificate of fitness specific to the construction work to be performed and issued by an occupational health practitioner in the form of Annexure 3.

A contractor must prior to performing any construction work-

- provide and demonstrate to the principal contractor a suitable and sufficiently documented health and safety plan, based on the relevant sections of the client's health and safety specification and provided by the principal contractor, which plan must be applied from the date of commencement of and for the duration of the construction work and which must be reviewed and updated by the contractor as work progresses;
- open and keep on site a health and safety file, which must include all documentation required in terms of the Act and these Regulations, and which must be made available on request to an inspector, the client, the client's agent or the principal contractor;
- before appointing another contractor to perform construction work be reasonably satisfied that the contractor that he or she intends to appoint has the necessary competencies and resources to perform the construction work safely;
- co-operate with the principal contractor as far as is necessary to enable each of them to comply with the provisions of the Act and Specifications;
- as far as is reasonably practicable, promptly provide the principal contractor with any information which might affect the health and safety of any person at work carrying out construction work on the site, any person who might be affected by the work of such a person at work, or which might justify a review of the health and safety plan.

Where a contractor appoints another contractor to perform construction work, the duties that apply to the principal contractor will apply to the contractor as if he or she were the principal contractor.

A principal contractor must take reasonable steps to ensure co-operation between all contractors appointed by the principal contractor to enable each of those contractors to comply with these Regulations.

No contractor may allow or permit any employee or person to enter any site, unless that employee or person has undergone health and safety induction training pertaining to the hazards prevalent on the site at the time of entry.

A contractor must ensure that all visitors to a construction site undergo health and safety induction pertaining to the hazards prevalent on the site and must ensure that such visitors have the necessary personal protective equipment.

A contractor must at all times keep on his or her construction site records of the health and safety induction training and such records must be made available on request to an inspector, the client, the client's agent or the principal contractor.

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A contractor must ensure that all his or her employees have a valid medical certificate of fitness specific to the construction work to be performed and issued by an occupational health practitioner in the form of Annexure 3 (a template of which can be found in the Construction Regulations, 2014).

2.2 Management and Supervision of Construction Work

A principal contractor must, in writing, appoint one full-time competent person as the construction manager with the duty of managing all the construction work on a single site, including the duty of ensuring occupational health and safety compliance, and in the absence of the construction manager an alternate must be appointed by the principal contractor.

A principal contractor must upon having considered the size of the project, in writing appoint one or more assistant construction managers for different sections thereof: Provided that the designation of any such person does not relieve the construction manager of any personal accountability for failing in his or her management duties in terms of this regulation.

Where the construction manager has not appointed assistant construction managers, or, in the opinion of an inspector, a sufficient number of such assistant construction managers have not been appointed, that inspector must direct the construction manager in writing to appoint the number of assistant construction managers indicated by the inspector, and those assistant construction managers must be regarded as having been appointed.

No construction manager appointed in terms of the Regulations may manage any construction work on or in any construction site other than the site in respect of which he or she has been appointed.

A contractor must, after consultation with the client and having considered the size of the project, the degree of danger likely to be encountered or the accumulation of hazards or risks on the site, appoint a full-time S A C P C M P a c c r e d i t e d construction health and safety officer in writing to assist in the control of all health and safety related aspects on the site.

No contractor may appoint a construction health and safety officer to assist in the control of health and safety related aspects on the site unless he or she is reasonably satisfied that the construction health and safety officer that he or she intends to appoint is registered with a statutory body approved by the Chief Inspector and has necessary competencies and resources to assist the contractor.

A construction manager must in writing appoint construction supervisors responsible for construction activities and ensuring occupational health and safety compliance on the construction site.

A contractor must, upon having considered the size of the project, in writing appoint one or more competent employees for different sections thereof to assist the construction supervisor, and every such employee has, to the extent clearly defined by the contractor in the letter of appointment, the same duties as the construction supervisor: Provided that the designation of such employee does not relieve the construction supervisor of any personal accountability for failing in his or her supervisory duties.

Where the contractor has not appointed such an employee, or, in the opinion of an inspector, a sufficient number of such employees have not been appointed, that inspector must instruct the employer to appoint the number of employees indicated by the inspector.

No construction supervisor appointed may supervise any construction work on or in any construction site other than the site in respect of which he or she has been appointed: Provided that if a sufficient number of competent employees have been appropriately designated on all the relevant construction sites, the appointed construction supervisor may supervise more than one site.

2.3 Notification of Intention to Commence Construction Work

The Contractor shall notify the Provincial Director of the Department of Labour of the intention to commence construction work at least 7 days prior to the works commencing if the intended construction work will:

- Include excavation work
- Include work at height where there is a risk of falling
- Include the demolition of a structure, or
- Include the use of explosives to perform construction work.

If the construction work involves construction of a single storey dwelling for a client, and such client will be residing in such dwelling upon completion, the contractor must also notify the Provincial Director of the Department of Labour at least 7 days before the works commence.

This must be done on a form similar to an Annexure 2 (template of which can be found in the Construction Regulations, 2014). A copy of the notification letter to the Provincial Director shall be forwarded to the Client for record purposes.

2.4 Construction Work Permit

It must be noted that from August 2018 all projects that meet the following criteria will require a construction work permit to be applied for at least 30 days prior to the work being carried out:

- Exceeds 3560 days
- Will involve more than 3600 person days of construction work
- Works contract is of a value equal to or exceeding forty million rand, or Construction Industry Grading Board (CIDB) grading level 7

It is the client's responsibility to apply for this permit from the Provincial Director and construction work may not commence until the permit has been issued by the Provincial Director.

A copy of this permit will be required to be kept in the principal contractors safety file, and the site specific number issued by the Provincial Director must be displayed at the main site entrance.

2.5 Assignment of Contractor's Responsible Persons to Manage Health and Safety on Site

The Contractor shall submit management and supervisory appointments as well as any relevant appointments in writing (as stipulated by the Construction Regulations 2014 and the Occupational Safety and Health Act 1993), prior to commencement of work (refer to **Annexure B** at the end of this Health and Safety Specification).

2.6 Competency for Contractor's Responsible Persons

The Contractor's responsible persons shall be competent in health and safety and be familiar with the Occupational Health and Safety Act 1993, and applicable regulations. Valid proof of pertinent and accredited, where applicable, health and safety courses attended by such persons will be required to be presented to the Client.

2.7 Compensation of Occupational Injuries and Diseases Act 130 of 1993 (COIDA)

The successful Contractor shall submit to the Client a valid letter of good standing with the Compensation Commissioner or Insurer prior to appointment.

2.8 Occupational Health and Safety Policy

The Contractor shall submit their Health and Safety Policy, prior to construction commencement, signed by the Chief Executive Officer. The Policy must outline objectives and how they will be achieved and implemented within the company operations.

2.9 Health and Safety Organogram

The Contractor shall submit an organogram, prior to construction commencement, outlining the Health and Safety Site Team that will be assigned to the project, if successful with the tender. In cases where appointments have not been made, the organogram shall reflect the position. The organogram shall be updated, when there is a change in the site team.

2.10 Risk Assessments

Baseline Risk Assessment

The Client shall cause a baseline risk assessment to be conducted by a competent person before the design process and tender process commence, and the assessed risks shall form part of the health and safety specifications.

The Contractor must, before commencement of any construction work, and during construction work, have risk assessments performed by a competent person appointed in writing, which risk assessments form part of the health and safety plan to be applied on the site and must include i.e.:

- The identification of the risks and hazards to which persons may be exposed to;
- An analysis and evaluation of the risks and hazards identified; based on a documented method;
- A documented plan and applicable safe work procedures to mitigate, reduce or control the risks and hazards that have been identified;
- A monitoring plan; and
- A review plan

The Contractor must ensure that, as far as is reasonably practicable, ergonomic related hazards are analysed, evaluated and addressed in a risk assessment.

The Contractor must ensure that all employees under his control are informed, instructed and trained by a competent person regarding any hazard and the related work procedures and/or control measures **before any work commences** and thereafter **at the times determined in the risk assessment monitoring and review plan of the relevant site.**

The Principal Contractor must ensure that all contractors are informed regarding any hazard that is stipulated in the risk assessment **before any work commences** and thereafter **at the times determined in the risk assessment monitoring and review plan of the relevant site.**

The Contractor must consult with the health and safety committee or with a representative trade union or representative group of employees if no health and safety committee exists, on the monitoring and review of the risk assessments for the site.

The Contractor must ensure that copies of risk assessment for this site are available on site for inspection purposes by interested parties (inspector, the client, client's agent, any contractor, any employee, a representative trade union, a health and safety representative or safety committee member.

A Contractor must review the relevant risk assessments where changes are effected to the design and/or construction that result in a change to the risk profile, or when an incident has occurred.

Preventative measures must first address the elimination of the hazard or risk. Should PPE be required to reduce risk, the equipment or clothing to be used must be SABS approved.

In general the Contractor must ensure that the Risk Assessment involves identifying the hazards present in a work activity on site. This is followed by an evaluation of the extent of the risk involved taking into account those precautions already being taken.

The following general principle should be followed when conducting a risk assessment:

- All relevant risks and/or hazards should be systematically addressed;
- The risk assessment should address what actually happens in the workplace during the work activity;
 - All employees and those who may be affected must be considered, including maintenance staff, security guards, visitors and subcontractors;
 - The risk assessment should highlight those groups and individuals who may be required to work alone or who have disabilities;
- The risk assessment process should take into account the existing safety measures and controls.
- The level of detail on a risk assessment should be appropriate to the level of risk.

2.11 Health and Safety Representative(s)

The Contractor shall ensure that Health and Safety Representative(s) is/are elected and trained to carry out his / her functions. The appointment must be in writing. The Health and Safety Representative shall carry out regular inspections, keep records and report to the supervisor to take appropriate action. He / she shall attend Health and Safety Committee Meetings. The Health and Safety Representative shall be part of the team that will investigate incidents, accidents and non-conformances.

2.12 Health and Safety Committee

Where two or more health and safety representatives have been appointed on site, the Contractor shall ensure that monthly health and safety meetings are held with such representatives and minutes are kept on record. Meetings must be organized and chaired by the Contractor's Health and Safety Committee Chairperson. Minutes of these meetings must be available for the employees of the contractor to refer to.

2.13 Medical Certificate of Fitness

The contractor must ensure that their employees on site have a valid medical certificate of fitness, specific to the construction work being performed, issued by an occupational health practitioner in the form of an Annexure 3 template (refer to the Construction Regulations 2014 on the Department of Labour website for a sample of this form).

2.14 Health and Safety Training

The Contractor shall quarterly conduct a training needs analysis to ascertain what health and safety training is required. A plan of action should be devised and forwarded to the Client for records. Once the identified people have attended the training, the Contractor must provide the Client with copies of certificates obtained.

2.14.1 Induction

No Contractor may allow or permit any employee or person to enter site unless they have undergone health and safety induction training pertaining to the hazards prevalent on site at the time of entry. This includes visitors to site. The Contractor must ensure that visitors to site have the necessary protective equipment (PPE). A copy of attendance registers of all employees who attend inductions shall be kept.

2.14.2 Awareness

The Contractor shall conduct periodic toolbox talks on site, preferably weekly or before any hazardous work takes place. The talks shall cover the relevant activity, risk assessments, methodology to be followed and an

attendance register must be signed by all attendees. This record of who attended and the content of the topic as well as presenter will be kept on the site health a safety file as evidence of training.

2.15 Competency

After the Contractor has identified the training to be conducted as part of the competency requirements, and based on the Risk Assessments, he shall send the relevant persons on appropriate courses and keep certificates of training for reference. Familiarity with the Health and Safety Act and Regulations is an integral part of the definition of competence.

2.16 General Record Keeping

The Contractor shall keep and maintain Health and Safety records to demonstrate compliance with the Health and Safety Specification and the Occupational Health and Safety Act. The contractor shall ensure that all records of incidents, spot fines, training etc. are kept on site. All documents shall be available for inspection by the Client, or the Department of Labour's Inspectors.

2.17 General Inspection, Monitoring and Reporting

The Contractor shall carry out inspections as required by this Health and Safety Specification, as well as by health and safety legislation.

2.18 Emergency Procedures

The Contractor shall submit a detailed Emergency Procedure for approval by the Client prior to commencement on site. The procedure shall detail the response plan including the following:

- List of key personnel;
- Details of emergency services;
- Actions or steps to be taken in the event of the emergency; and
- Information on hazardous materials / situations, including each material's hazardous potential impact or risk on the environment or human and measures to be taken in the event of an accident.

Emergency procedure(s) shall include, but shall not be limited to, fire, spills, accidents to employees, use of hazardous substances, dangers as a result of riot / service deliver protests / intimidation, etc. The Contractor shall advise the Client in writing of any on-site emergencies, together with a record of action taken, within 24 hours of the emergency occurring. A contact list of all service providers (Fire Department, Ambulance, Police, Medical and Hospital, etc) must be maintained and available to site personnel.

2.19 First Aid Box and First Aid Equipment

The Contractor shall provide first aid box/es and appoint, in writing, First Aider(s) for this project in line with the results of the Contractor's risk assessment for the project, this health and safety specification as well as the provisions of the General Safety Regulations. The appointed First Aider(s) are to be sent for accredited first aid training before starting on site. Valid certificates are to be kept on site.

First Aid box/es must be adequately stocked at all time, accessible and be controlled by a qualified First Aider. If required by the Client, the Contractor shall have a stretcher on site to be used in case of a serious incident.

2.20 Accident / Incident Reporting and Investigation

The Contractor shall, in addition to the prescribed requirements of the Occupational Health and Safety Act and General Safety Regulations, investigate, record and report all Section 24 reportable incidents to the Client within 24 hours of the incident occurring. Incident investigations shall be conducted by the Contractor's appointed Accident Investigator – this Investigator must be a competent person or persons who have sufficient knowledge and training to carry out an investigation.

In the event of a fatality or a permanent disabling injury the Contractor must submit proof of reporting of incident to Department of Labour as well as proof of preventative measures to the Client. The Client reserves the right to conduct investigations into any incidents that they deem fit and the Contractor is required to provide full co-operation in this regard.

2.21 Hazards and Potential Situations

The Contractor shall immediately notify other Contractors of any hazardous or potentially hazardous situations, which may arise during performance of the activities.

2.22 Occupational Health and Safety Signage

The Contractor shall ascertain and provide adequate on site health and safety signage. This signage shall include, but shall not be limited to, Hard Hat / Helmet Area; Safety Shoes to be worn on site; Dust Masks to be worn in areas where there might be exposure to excessive dust; Ear Plugs / Muffs to be worn where there might be noise exposure over 85 db; Gloves; Safety Goggles; Safety Harness, Workers in Excavation, traffic management, etc. The Contractor shall be responsible to maintain the quality and replacement of signage.

2.23 Management Of Contractors by Principal Contractor

The Principal Contractor shall ensure that all contractors under his control are complying with the respective Health and Safety Specifications and Plans, as well as Health and Safety Legislation.

2.24 Stacking of Materials

In addition to the provisions for the stacking of articles in the General Safety Regulations, 2003, the contractor must ensure that –

- a competent person is appointed in writing with the duty of supervising all stacking and storage on a construction site;
- adequate storage areas are provided;
- there are demarcated storage areas; and
- storage areas are kept neat and under control.

2.25 Housekeeping and General Safeguarding on Construction Sites

A contractor must, in addition to compliance with the Environmental Regulations for Workplaces, 1987, promulgated by Government Notice No. R. 2281 of 16 October 1987, ensure that suitable housekeeping is continuously implemented on each construction site, including-

- the proper storage of materials and equipment;
- the removal of scrap, waste and debris at appropriate intervals;
- ensuring that materials required for use, are not placed on the site so as to obstruct means of access to and egress from workplaces and passageways;
- ensuring that materials which are no longer required for use, do not accumulate on and are removed from the site at appropriate intervals;
- ensuring that waste and debris are not disposed of from a high place with a chute, unless the chute complies with the requirements set out in the regulations;
- ensuring that construction sites in built-up areas adjacent to a public way are suitably and sufficiently fenced off and provided with controlled access points to prevent the entry of unauthorized persons; and
- ensuring that a catch platform or net is erected above an entrance or passageway or above a place where persons work or pass under, or fencing off the danger area if work is being performed above such entrance, passageway, or place so as to ensure that all persons are kept safe in the case of danger or possibility of persons being struck by falling objects.

2.26 Construction Vehicles and Mobile Plant

A contractor must ensure that all construction vehicles and mobile plant-

- are of an acceptable design and construction;
- are maintained in a good working order;
- are used in accordance with their design and the intention for which they were designed, having due regard to safety and health;
- are operated by a person who-
 - has received appropriate training, is certified competent and in possession of proof of competency and is authorised in writing to operate those construction vehicles and mobile plant;
 - has a medical certificate of fitness to operate those construction vehicles and mobile plant, issued by an occupational health practitioner in the form of Annexure 3.
- have safe and suitable means of access and egress;
- are properly organized and controlled in any work situation by providing adequate signalling or other control arrangements to guard against the dangers relating to the movement of vehicles and plant, in order to ensure their continued safe operation;
- are prevented from falling into excavations, water or any other area lower than the working surface by installing adequate edge protection, which may include guard-rails and crash barriers;
- are fitted with structures designed to protect the operator from falling material or from being crushed should the vehicle or mobile plant overturn;
- are equipped with an acoustic warning device which can be activated by the operator;
- are equipped with an automatic acoustic reversing alarm; and
- are inspected by the authorised operator or driver on a daily basis using a relevant checklist prior to use and that the findings of such inspection are recorded in a register kept in the construction vehicle or mobile plant.

A contractor must ensure that-

- no person rides or is required or permitted to ride on a construction vehicle or mobile plant otherwise than in a safe place provided thereon for that purpose;
- every construction site is organized in such a way that, as far as is reasonably practicable, pedestrians and vehicles can move safely and without risks to health;
- the traffic routes are suitable for the persons, construction vehicles or mobile plant using them, are sufficient in number, in suitable positions and of sufficient size;
- every traffic route is, where necessary, indicated by suitable signs;
- all construction vehicles and mobile plant left unattended at night, adjacent to a public road in normal use or adjacent to construction areas where work is in progress, have appropriate lights or reflectors, or barricades equipped with appropriate lights or reflectors, in order to identify the location of the vehicles or plant;
- all construction vehicles or mobile plant when not in use, have buckets, booms or similar appendages, fully lowered or blocked, controls in a neutral position, motors stopped, wheels chocked, brakes set and ignition secured;
- whenever visibility conditions warrant additional lighting, all mobile plant are equipped with at least two headlights and two taillights when in operation;
- tools, material and equipment are secured and separated by means of a physical barrier in order to prevent movement when transported in the same compartment with employees;
- vehicles used to transport employees have seats firmly secured and adequate for the number of employees to be carried; and
- all construction vehicles or mobile plant travelling, working or operating on public roads comply with the requirements of the National Road Traffic Act, 1996.

2.27 Electrical Installations and Machinery on Construction Sites

A contractor must, in addition to compliance with the Electrical Installation Regulations and the Electrical Machinery Regulations, ensure that –

- before construction commences and during the progress thereof, adequate steps are taken to ascertain the presence of and guard against danger to workers from any electrical cable or apparatus which is under, over or on the site;
- all parts of electrical installations and machinery are of adequate strength to withstand the working conditions on construction sites;
- the control of all temporary electrical installations on the construction site is designated to a competent person who has been appointed in writing for that purpose;
- all temporary electrical installations used by the contractor are inspected at least once a week by a competent person and the inspection findings are recorded in a register kept on the construction site; and
- all electrical machinery is inspected by the authorized operator or user on a daily basis using a relevant checklist prior to use and the inspection findings are recorded in a register kept on the construction site.

2.28 Use and Temporary Storage of Flammable Liquids on Construction Sites

A contractor must, in addition to compliance with the provisions for the use and storage of flammable liquids in the General Safety Regulations, 2003, ensure that –

- where flammable liquids are being used, applied or stored at the workplace concerned, it is done in a manner that does not cause a fire or explosion hazard, and that the workplace is effectively ventilated;
- no person smokes in any place in which flammable liquid is used or stored, and the contractor must affix a suitable and conspicuous notice at all entrances to any such areas prohibiting such smoking;
- an adequate amount of efficient fire-fighting equipment is installed in suitable locations around the flammable liquids store with the recognized symbolic signs;
- only the quantity of flammable liquid needed for work on one day is taken out of the store for use;
- all containers holding flammable liquids are kept tightly closed when not in actual use and, after their contents have been used up, are removed from the construction site and safely disposed of;
- where flammable liquids are decanted, the metal containers are bonded and earthed; and
- no flammable material, including cotton waste, paper, cleaning rags or similar material is stored together with flammable liquids.

Water environments

A contractor must ensure that where construction work is done over or in close proximity to water, provision is made for –

- preventing persons from falling into water; and
- the rescuing of persons in danger of drowning.

A contractor must ensure that where a person is exposed to the risk of drowning by falling into the water, the person is provided with and wears a lifejacket.

2.30 Fire precautions on Construction Sites

A contractor must, in addition to compliance with the Environmental Regulations for Workplaces, 1987, ensure that –

- all appropriate measures are taken to avoid the risk of fire;
- sufficient and suitable storage is provided for flammable liquids, solids and gases;
- smoking is prohibited and notices in this regard are prominently displayed in all places containing readily combustible or flammable materials;
- in confined spaces and other places in which flammable gases, vapours or dust can cause danger-
 - only suitably protected electrical installations and equipment, including portable lights, are used;
 - there are no flames or similar means of ignition;

- there are conspicuous notices prohibiting smoking;
- oily rags, waste and other substances liable to ignite are without delay removed to a safe place; and
- adequate ventilation is provided;
- combustible materials do not accumulate on the construction site;
- welding, flame cutting and other hot work are done only after appropriate precautions have been taken to reduce the risk of fire;
- suitable and sufficient fire-extinguishing equipment is placed at strategic locations or as may be recommended by the Fire Chief or local authority concerned, and that such equipment is maintained in a good working order;
- the fire equipment contemplated above is inspected by a competent person, who has been appointed in writing for that purpose, in the manner indicated by the manufacturer thereof;
- a sufficient number of workers are trained in the use of fire-extinguishing equipment;
- where appropriate, suitable visual signs are provided to clearly indicate the escape routes in the case of a fire;
- the means of escape is kept clear at all times;
- there is an effective evacuation plan providing for all -
 - persons to be evacuated speedily without panic;
 - persons to be accounted for; and
 - plant and processes to be shut down; and
- a siren is installed and sounded in the event of a fire.

2.31 Construction Employees' Facilities

A contractor must, in terms of the Construction Regulations 2014, provide:

- Shower facilities after consultation with the employees or employees representatives, or at least one shower facility for every 15 persons;
- at least one sanitary facility for each sex and for every 30 workers;
- changing facilities for each sex;
- and sheltered eating area.

A contractor must provide reasonable and suitable living accommodation for the workers at construction sites who are far removed from their homes and where adequate transportation between the site and their homes, or other suitable living accommodation, is not available.

2.32 Fall protection

Not applicable to this project.

2.33 Temporary works

A contractor must appoint a temporary works designer in writing to design, inspect and approve the erected temporary works on site before use.

A contractor must ensure that all temporary works operations are carried out under the supervision of a competent person who has been appointed in writing for that purpose.

A contractor must ensure that-

- all temporary works structures are adequately erected, supported, braced and maintained by a competent person so that they are capable of supporting all anticipated vertical and lateral loads that may be applied to them, and that no loads are imposed onto the structure that the structure is not designed to withstand;
- all temporary works structures are done with close reference to the structural design drawings, and where any uncertainty exists the structural designer should be consulted;

- detailed activity specific drawings pertaining to the design of temporary works structures are kept on the site and are available on request to an inspector, other contractors, the client, the client's agent or any employee;
- all persons required to erect, move or dismantle temporary works structures are provided with adequate training and instruction to perform those operations safely;
- all equipment used in temporary works structure are carefully examined and checked for suitability by a competent person, before being used;
- all temporary works structures are inspected by a competent person immediately before, during and after the placement of concrete, after inclement weather or any other imposed load and at least on a daily basis until the temporary works structure has been removed and the results have been recorded in a register and made available on site;
- no person may cast concrete, until authorization in writing has been given by the competent person contemplated above;
- if, after erection, any temporary works structure is found to be damaged or weakened to such a degree that its integrity is affected, it is safely removed or reinforced immediately;
- adequate precautionary measures are taken in order to-
 - secure any deck panels against displacement; and
 - prevent any person from slipping on temporary works due to the application of release agents;
- as far as is reasonably practicable, the health of any person is not affected through the use of solvents or oils or any other similar substances;
- upon casting concrete, the temporary works structure is left in place until the concrete has acquired sufficient strength to safely support its own weight and any imposed load, and is not removed until authorization in writing has been given by the competent person;
- the foundation conditions are suitable to withstand the loads caused by the temporary works structure and any imposed load in accordance with the temporary works design;
- provision is made for safe access by means of secured ladders or staircases for all work to be carried out above the foundation bearing level;
- a temporary works drawing or any other relevant document includes construction sequences and methods statements;
- the temporary works designer has been issued with the latest revision of any relevant structural design drawing;
- a temporary works design and drawing is used only for its intended purpose and for a specific portion of a construction site; and
- the temporary works drawings are approved by the temporary works designer before the erection of any temporary works.

No contractor may use a temporary works design and drawing for any work other than its intended purpose.

2.34 Excavation

A contractor must-

- ensure that all excavation work is carried out under the supervision of a competent person who has been appointed in writing for that purpose; and
- evaluate, as far as is reasonably practicable, the stability of the ground before excavation work begins.

A contractor who performs excavation work-

- must take reasonable and sufficient steps in order to prevent, as far as is reasonably practicable, any person from being buried or trapped by a fall or dislodgement of material in an excavation;
- may not require or permit any person to work in an excavation which has not been adequately shored or braced: Provided that shoring and bracing may not be necessary where-
 - the sides of the excavation are sloped to at least the maximum angle of repose measured relative to the horizontal plane; or
 - such an excavation is in stable material: Provided that-

- permission has been given in writing by the appointed competent person contemplated above upon evaluation by him or her of the site conditions; and
- where any uncertainty pertaining to the stability of the soil still exists, the decision from a professional engineer or a professional technologist competent in excavations is decisive and such a decision must be noted in writing and signed by both the competent person and the professional engineer or technologist, as the case may be;
- must take steps to ensure that the shoring or bracing contemplated above is designed and constructed in a manner that renders it strong enough to support the sides of the excavation in question;
- must ensure that no load, material, plant or equipment is placed or moved near the edge of any excavation where it may cause its collapse and consequently endangers the safety of any person, unless precautions such as the provision of sufficient and suitable shoring or bracing are taken to prevent the sides from collapsing;
- must ensure that where the stability of an adjoining building, structure or road is likely to be affected by the making of an excavation, steps are taken to ensure the stability of such building, structure or road and the safety of persons;
- must cause convenient and safe means of access to be provided to every excavation in which persons are required to work, and such access may not be further than six meters from the point where any worker within the excavation is working;
- must ascertain, as far as is reasonably practicable, the location and nature of electricity, water, gas or other similar services which may in any way be affected by the work to be performed, and must before the commencement of excavation work that may affect any such service, take the steps that are necessary to render the circumstances safe for all persons involved;
 - must ensure that every excavation, including all bracing and shoring, is inspected-
 - daily, prior to the commencement of each shift;
 - after every blasting operation;
 - after an unexpected fall of ground;
 - after damage to supports; and
 - after rain,

by the competent person, in order to ensure the safety of the excavation and of persons, and those results must be recorded in a register kept on site and made available on request to an inspector, the client, the client's agent, any other contractor or any employee;

- must cause every excavation which is accessible to the public or which is adjacent to public roads or thoroughfares, or whereby the safety of persons may be endangered, to be –
 - adequately protected by a barrier or fence of at least one metre in height and as close to the excavation as is practicable; and
 - provided with warning illuminants or any other clearly visible boundary indicators at night or when visibility is poor, or have resort to any other suitable and sufficient precautionary measure where this is not practicable;
- must ensure that all precautionary measures stipulated for confined spaces as determined in the General Safety Regulations, 2003, are complied with by any person entering any excavation;
- must, where the excavation work involves the use of explosives, appoint a competent person in the use of explosives for excavation, and must ensure that a method statement is developed by that person in accordance with the applicable explosives legislation; and
- must cause warning signs to be positioned next to an excavation within which or where persons are working or carrying out inspections or tests.

2.35 Demolition Work

Not applicable to this project.

2.36 Tunnelling

Not applicable to this project.

2.37 Scaffolding

Not applicable to this project.

2.38 Bulk mixing plant

A contractor must ensure that the operation of a bulk mixing plant is supervised by a competent person who has been appointed in writing and is –

- aware of all the dangers involved in the operation thereof; and
- conversant with the precautionary measures to be taken in the interest of health and safety.

No person supervising or operating a bulk mixing plant may authorize any other person to operate the plant, unless that person is competent to operate a bulk mixing plant.

A contractor must ensure that the placement and erection of a bulk mixing plant complies with the requirements set out by the manufacturer and that such plant is erected as designed.

A contractor must ensure that all devices to start and stop a bulk mixing plant are provided and that those devices are placed in an easily accessible position and constructed in a manner to prevent accidental starting.

A contractor must ensure that the machinery and plant selected is suitable for the mixing task and that all dangerous moving parts of a mixer are placed beyond the reach of persons by means of doors, covers or other similar means.

No person may remove or modify any guard or safety equipment relating to a bulk mixing plant, unless authorized to do so by the appointed person.

A contractor must ensure that all precautionary measures stipulated for confined spaces as determined in the General Safety Regulations, 2003, are complied with when entering any silo.

A contractor must ensure that a record is kept of all repairs or maintenance to a bulk mixing plant and that the record is available on site to an inspector, the client, the client's agent or any employee.

2.39 Rope Access Work

Not applicable to this project.

2.40 Hazardous Chemical Substances (HCS)

In addition to the requirements in the HCS Regulations, the principal contractor must provide proof in the Health and Safety Plan that:

- Material Safety Data Sheets (MSDS's) of the relevant materials / hazardous chemical substances are available prior to use by the contractor. All MSDS's shall be available for inspection by the agent at all times.
- Risk assessments are done at least once every 6 months.
- Exposure monitoring is done according to OESSM and by an Approved Inspection Authority (AIA) and that the medical surveillance programme is based on the outcomes of the exposure monitoring.
- How the relevant HCS's are being/going to be controlled by referring to:
 - Limiting the amount of HCS
 - Limiting the number of employees
 - Limiting the period of exposure
 - Substituting the HCS
 - Using engineering controls
 - Using appropriate written work procedures
- The correct PPE is being used.

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- HCS are stored and transported according to SABS 072 and 0228.
- Training with regards to these regulations was given.

The Health and Safety plan should make reference to the disposal of hazardous waste on classified sites and the location thereof (where applicable).

The First Aider must be made aware of the MSDS and trained in how to treat HCS incidents appropriately.

2.41 Noise Induced Hearing Loss

Where noise is identified as a hazard the requirements of the NIHL regulations must be complied with and the following must be included / referred to in the Health and Safety Plan:

- Proof of training with regards to these regulations.
- Risk assessment done within 1 month of commencement of work.
- That monitoring carried out by an AIA and done according to SABS 083.
- Medical surveillance programme established and maintained for the necessary employees.
- Control of noise by referring to:
 - Engineering methods considered
 - Admin control (number of employees exposed) considered
 - Personal protective equipment considered/decided on
 - Describe how records are going to be kept for 40 years.

2.42 Explosives and Blasting

Not applicable to this project.

2.43 Personal Protective Equipment (PPE)

The Contractor shall carry out PPE or clothing needs analysis in accordance with his risk assessment, to determine the necessary PPE or clothing to be used during construction. The Contractor shall make provision and keep adequate quantities of SABS approved PPE or clothing on site at all times.

The Contractor must ensure that personnel are trained in the correct use of PPE to be used.

The Contractor must ensure that lost, stolen, worn out or damaged PPE is replaced as required and receipt signed for by employees on site.

2.44 Asbestos

Not applicable to this project.

2.45 Pressure Vessels (Including Gas Bottles)

The Contractor shall comply with Pressure Equipment Regulations, including:

- Providing competency and awareness training to the operators;
- Providing PPE or clothing;
- Providing and maintain appropriate signage in areas where pressure vessels are used, as applicable;
- Inspect equipment regularly and keep records of inspections;
- Providing appropriate firefighting equipment (Fire Extinguishers).

2.46 Fire Extinguishers and Fire Fighting Equipment

The Contractor shall provide adequate, regularly serviced fire extinguishers located at strategic points on site. The Contractor shall keep spare serviced portable fire extinguishers. The Contractor shall have adequate persons trained or competent to use the Fire Fighting Equipment.

Safety signage shall be posted up in all areas where fire extinguishers are located.

Proof that an adequate number of employees have been trained in firefighting must be kept on site.

2.47 Lifting Machinery and Tackle

Not applicable to this project.

2.48 Ladders and Ladder work

The Contractor shall ensure that all ladders are numbered and inspected regularly as well as keeping record of inspections. It should be noted that Aluminium ladders are preferred to wooden ladders.

2.49 General Machinery

The Contractor shall comply with the Driven Machinery Regulations, which include inspecting machinery regularly, appointing a competent person to inspect and ensure maintenance, issuing PPE or clothing and training those that use machinery and enforce compliance.

2.50 Portable Electrical Tools

The Contractor shall ensure that use and storage of all explosive actuating fastening devices and portable electrical tools are in compliance with relevant legislation.

The Contractor shall consider that:

- A competent person undertakes routine inspections;
- Only authorised persons use the tools;
- There are safe working procedures applied;
- Awareness training is carried out and compliance is enforced at all times; and
- PPE and clothing is provided and maintained.

2.51 High Voltage Electrical Equipment

The Contractor shall ensure that, where the work is under, on or near high-voltage electrical equipment the Electrical Installation Regulations, together with safety instructions (Regulations of the Owner of the Equipment) are complied with. Such equipment includes:

- Eskom and the Local Authority equipment
- The Contractor's own power supply; and
- Electrical equipment being installed but not yet taken over from a Contractor by The Client.

2.52 Public Health and Safety

The Contractor shall ensure that each person working on or visiting a site, and the surrounding community, shall be made aware of the dangers likely to arise from on-site activities and the precautions to be observed to avoid or minimize those dangers. Appropriate health and safety signage shall be posted at all times.

2.53 Night Work

The Contractor shall not undertake any night work without prior arrangement and a written permit from the Employer. The Contractor shall ensure that adequate lighting is provided for all night work and failure to do so shall result in work being stopped.

2.54 Environmental Conditions and Flora and Fauna

The Contractor must be mindful of adverse weather conditions upon the health and safety of the workforce. This includes inclement weather, strong wind, heat stress, extreme cold, etc. The Contractor's risk assessment process must take into account the risks associated with such weather conditions. The same is true when working in an environment where there is a risk to employees' health and safety from presence of poisonous flora, or wildlife (including bees, snakes, etc). The Contractor's risk assessment process must take these risks into account.

2.55 Occupational Health

Exposure of workers to occupational health hazards and risks are very common in any work environment, especially in construction. Occupational health hazards and risks exposure is a major problem and all Contractors are to ensure that proper health and hygiene measures are put in place to prevent exposure to these hazards and risks.

The occupational hazards and risks may enter the body in three ways:

- Inhalation through breathing e.g. cement dust;
- Ingestion through swallowing maybe through food intake; and/or
- Absorption through the skin (pores) e.g. painting or use of thinners.

The contractor is required to ensure that all his personnel are medically fit prior to being allowed onto the work site.

All Contractors should ensure that Occupational Hygiene surveys are conducted as per the Occupational Health and Safety Act to ensure employees is not exposed to hazards. Risk Assessments should identify areas where surveys are to be conducted.

2.56 Suspended Platforms

Not applicable to this project.

2.57 Material Hoists

Not applicable to this project.

2.58 Explosive Actuated Fastening Device

See item 2.50.

Both the Client and the Contractor have a duty in terms of health and safety legislation to do all that is reasonably practicable to prevent members of the public and others being affected by the construction processes, to be aware off and put and maintain preventative measure. The public or visitors shall go through a brief health and safety induction detailing hazards and risks they may be exposed to and what measures are in place to control these hazards and risks.

OTHER HEALTH AND SAFETY SPECIFICATION REQUIREMENTS

The contractor must be aware of the following additional requirements:

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What	When	Output
Awareness training (Toolbox Talks)	At least fortnightly and before hazardous work is carried out as well as covering applicable risk assessments and method statements	Attendance Register
Health and Safety Committee Meetings	Monthly	Minutes signed by the employer (Contractor) covering: a) Health and Safety Representative Checklist
Health and Safety Reports	Monthly	Report covering: a) Incidents/Accidents and Investigations b) Non conformance c) Health and Safety Training d) HIRA Updates e) Internal and External Audits
General Inspections	As per Health and Safety Specification and OHSA	Report on Health and Safety Specification and OHSA compliance: a) b) Excavation c) Equipment d) Vehicles
General Inspections	Monthly	Covering: a) Firefighting Equipment b) Portable Electrical Equipment c) Ladders
Record keeping	Ongoing	Covering: a) General complaints b) Fines c) General incidents d) MSDS' e) Surveillance Medicals f) Inspection Register g) Dept of Labour Notices
Permits	Before commencement with certain activities	As stipulated by the Health and Safety Specification and the OHSA / Construction Regulations <ul style="list-style-type: none"> Construction works permit

Key:

OHSA – Occupational Health and Safety Act, 1993

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ANNEXURE A

The Contractor shall submit the info below in an Annexure 2 prior to construction commencement.

Item No.	Health and Safety Specification Requirement	OHSa Requirement	Submission date
1.			
2.			
3.	Assignment of Responsible Person to Manage Building Work via Health and Safety Organogram	Construction Regulations 2014	Before commencement on site
4.	Competency for Health and Safety Positions	Client / Client Agent requirement	Before commencement on site
5.	Compensation of Occupational Injuries and Diseases Act (COIDA) 130 of 1993	COIDA Requirement	Before commencement on site
6.	Occupational Health and Safety Policy	Client / Client Agent requirement	Before commencement on site
7.	Risk Assessment, Safety Plan and Fall Protection Plan, Demolition Method Statement	Client / Client Agent requirement	Before construction work commences

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ANNEXURE B - The contractor shall make the following appointments, as required:

Chief Executive Officer (OSHACT 16(1))
Contract Director/Manager (OSHACT 16(2))
Construction Manager (CR 8(1))
Assistant Construction Manager (CR8(2))
Construction Supervisor (CR 8(7))
Assistant Construction Supervisor (CR 8(8))
Construction Safety Officer (CR 8(5))
Traffic Safety Officer
Safety Representative (where > 20 employees on site)
Temporary work Designer (CR 12(1))
Temporary work Supervisor (CR12(2))
Construction risk assessor (CR 9(1))
Excavation Supervisor (CR13(1)(a))
Demolition Supervisor (CR14(1))
)
Bulk Mixing Plant Supervisor (CR20(1))
Bulk Mixing Plant Operator (CR20(2))
Controller of Explosive Actuated Fastening Devices Nails, Cartridges or Studs Issue and Collection (CR21(2)(g)(1))
Construction Vehicle and Mobile Plant Operator (CR23(1)(d)(i))
Controller of Temporary Electrical Installations (CR24(c))
Stacking Supervisor (CR28(a))
Fire Extinguishing Equipment Inspector (CR29(h))
Incident Investigator (OSHACT 9(2))
Competent Person – Confined Spaces (GAR 5(1))

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BASE LINE RISK ASSESSMENT: Construction of runway access roads and turning ear at East London Airport											1	4	12
Risk Rating multiplier: Low = 1; Medium = 2; High = 3											2	6	18
											3	8	27
Baseline Raw Design Risk - Typical behaviour given the design / factors present Residual Risk - The extra factors noted that must be in place to reduce the risk Low Risk - Does not mean that the activity is safe, or that potential injuries and / or fatalities are eliminated Key Risks will be assessed and reported on in the Site Specific H&S Specification New tasks require assessment as the project progresses. and safe work procedures to be revised on an annual basis											All method Statements, risk analyses		
GAR GSR SANS SABS NIHL GMR OHS Act SWP MS HCS PrDP CR			General Administration Regulations General Safety Regulations South African National Standards South African Bureau of Standards Noise Induced Hearing Loss General Machinery Regulations Occupational Health and Safety Act and Regulations 85 of 1993 Safe Work Procedures Method Statements Hazardous Chemical Substances Professional Driving Permit Construction Regulations		Baseline Raw Design Risk			Residual Risk					
REF	Design Aspects present	Describe the obvious methods usually provided by the Contractor	Risks	Likely consequences of an accident	Frequency of Exposure	Probability of harm	Risk rating and risk category	Extra control measures necessary to reduce risk / Redesign	Likely consequences of an accident	Frequency of Exposure	Probability of harm	Risk rating and risk category	
SITE ESTABLISHMENT													
12.02	Overhead Eskom, if near proposed construction, Eskom will remove own services where required. PC will expose and protect services. May be illegal connections	Hand exposure of and protection services. Demarcation of services with candy tape	Contact with high voltage electricity. Contact with contaminated water	2	1	1	2	Competent supervision and adequate pre-task training required. All excavations open longer than 24hours to be demarcated with netting or similar, at least .5m away from edge	1	1	1	1	
	Potable water is available in the towns and rural water schemes are available for use. Water lines may require moving	Extra water may need to be taken to site, haulage from approved rivers, permits obtained. PC may need potable water connections at accommodation and site camp	Ingestion of contaminated water	2	3	2	12	Treatment of contaminated water will be required, water testing will take place regularly. Tankers of water may be required to be brought in from other sources	1	3	2	6	
1400	Construction plant workshops and camps to be established and maintained by the contractor for the duration of the contract.	A number of camps may be established and maintained for various activities to construct what is required to undertake the works. Concrete floors will be cast	Worker struck by Vehicle or plant. Load falls on worker	3	3	3	27	The PC will be required to submit with his H & S plan the method statements, risk assessments and supporting documentation to ensure overall activities are managed.	2	3	2	12	
	Setting up Offices and other buildings	Container offices may be used. This will need loading and offloading using cranes/crane trucks. Clearing and levelling of site using heavy machinery	Cranes fails load falls on worker; worker struck by plant or machinery					The PC will be required to submit with his pre-tender H&S plan the method statements, risk assessments and supporting documentation to ensure overall activities are managed. All formwork to adhere to specification and require method statements					

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ACCESS CONTROL												
	Access control to camp site	Camp site fenced and access limited to authorised persons. General public to be kept clear of work sites along the road although passage through the site must be allowed	Public enter site, theft, damage to property	2	2	2	8	Access control by guard. Register to be completed. Work sites on road to be clear of members of the public. Care in road works must form part of worker induction	2	1	2	4
LABORATORY												
1402	Establishment and use of joint site laboratory. Laboratory will be used by Civil PC and Client, will be treated as a PC reporting to the Resident Engineer, managed by H&S Agent, but will follow site rules of Civil PC	Ovens, radioactive equipment, bitumen testing, storage of test cubes, materials and chemicals. Various site activities to collect samples on site and test. Fire protection, first aid cover and daily checklists usually provided	Contact with hot equipment or material, radiation risk, noise, dust	2	3	3	18	Monthly inspections by the H&S Agent, Laboratory is controlled and managed as a PC by the Engineer	2	3	2	12
STAFF HOUSING												
	Staff and workers will be housed in local accommodation or at PC's existing camp	Housing already established	poor accommodation, no proper sanitation, lighting or ventilation	2	3	2	12	Accommodation must be adequate for workers and staff. Proper sanitation, ventilation and space	2	3	1	6
TRAFFIC ACCOMMODATION												
1500	Traffic accommodation will be required throughout the project. Construction and maintenance will normally be in half widths	Appointment of Traffic Safety officer - Construction drawings from the Consultants will be provided for the standard requirements. Use of TSO's to ensure all traffic requirements are met over 24 hour, 7 day periods. Demarcation to ensure public walkways identified around schools and clinics. Stop/go closures to be properly set up.	Collision between plant or transport. Collision between private and/or contractor vehicles. Worker struck by vehicle. Flag persons are highly vulnerable	3	3	3	27	Any deviations from construction drawings to be in line with SARTSM Ch 13 Vol 2, and approved by RE. Method statements and risk assessments to reflect management of same. TSOs to be adequately trained and use of drawings to be basis of daily checks. TSOs to report to H&S Officer. Penalties to be issued for non-compliances. Flag persons to have adequate PPE for tasks. Night time closures to be properly lit and workers to be supplied with adequate torches	2	3	3	18
MATERIALS												
1512	Material will require haulage through the project. Material will possibly be collected and stored for re- use	Spoil material will be moved around the site. Co-contractors may be used for haulage. Road wetting to manage dust	Collision between plant or transport. Collision between private and/or contractor vehicles. Worker struck by vehicle, noise dust, speeding vehicles	3	3	3	27	PC will ensure only competent contractors appointed 7 days prior to commencing work, only competent, fit operators to be used	3	3	2	18

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PLANT AND EQUIPMENT												
	All plant will be heavy vehicles, including: tipper trucks, Bell dumpers, loaders.	Use of Tipper trucks, dumpers, loaders, excavators, TLBs, bulldozers graders and rollers	Collision between plant or transport. Collision between private and/or contractor vehicles. Worker struck by vehicle, noise dust, speeding vehicles	3	3	3	27	CVs, including training and medical certificates required for all operators. Daily records on H&S file may not be more than a week behind. An updated list of daily plant to be kept by the H&S Officer	3	3	2	18
CLEARING AND GRUBBING												
1703/	Clearing and Grubbing generally on site	Use of machinery such as graders and hand clearing and excavation	Worker struck by Vehicle, plant or hand tool. Dust, noise	3	3	3	27	Pre-tender H&S plan, method statements, risk assessments and other supporting documentation to ensure all clearing and grubbing activities are adequately managed. Traffic accommodation required	3	3	2	18
DAY WORKERS												
1800	Day works are required for various labour and plant	Use of local labour, and SMMEs to provide services and plant for items not in BoQ	Worker struck by Vehicle or plant. Dust, Noise. Other dependant on operation	3	3	3	27	Provision of H&S Spec, Training of labour, first aid provision and appropriate medical care to be provided. Use of MSDSs for assessing specific needs. Method statements, risk assessments, competent supervision and training records available for type of plant required as per the H&S Specification	2	3	2	12
SERIES 2000: DRAINAGE												
2104 / 2216	Side drains and cut off drains sub-soil drains. Depth of max 2 m, drainage pipes, concrete structures, manholes and cleaning eyes, testing of subsoil drains	Excavation for sub-soil drains by TLB, side and mitre drains out by grader. Laying of plastic drain pipe in sub-soil drains, backfilled with stone and soil material	Worker engulfed by collapsing trench, water fills trench, worker falls into trench. Use of excavation plant. Ergonomic risks to workers	3	2	2	12	Should Fin drains not be used, workers are to rotate to limit musculoskeletal disorders at 3 hourly intervals between activities. Any Contractor to be approved 7 days prior to commencing work. Work on steep slopes to be addressed in method statements and risk assessments	2	2	1	4
2200	Repair of culverts. Areas include catch pits and manholes, around subsoil drains or storm water management systems (V-drains).	Demarcation of open excavations, competent supervision for excavations appointed, daily registers of plant and equipment, method statements and risk assessments, proof of training. Batter back edges, some shoring may be required	Worker engulfed by collapsing trench, water fills trench, worker falls into trench. Worker struck by machine.	3	3	3	27	CV of appointee responsible for excavations to show training regarding H&S, limit number of open excavations, especially around schools and areas where public access possibly an issue. Demarcation using orange netting or similar and be at least 0.5m away from edge of excavation. Berms at least 1m from edge. Battering or shoring to be approved by RE. Fines will be issued for non compliance	3	3	2	18
2200 .12	Removal of existing concrete	Use of pavement breakers, removal of spoil to off site dump	Worker struck by pavement breaker, other plant or falling concrete, noise, dust	2	3	2	12	Method statements and risk analyses, noise measurements and establishment of noise zones. Dust to be monitored	2	2	2	8
2300	Concrete kerbing, channelling, chutes and downpipes, and concrete linings for open drains.	Kerbs and other concrete products may be moved by machine or hand. Delivery normally by truck and offloading by crane. Concrete linings for drains cast in situ. Work to be done by SMME contractors	Worker injured by falling kerb, pipe or chute; Ergonomic risks. C, contact with fresh concrete, vibration; noise	3	3	2	18	Terrain to be covered and method statements and HIRA to be managed accordingly. Loading and offloading to be supervised. Proper training. Contractor to provide H&S Plans and risk analyses before work starts.	3	3	1	9
2302 / 2303	Any materials to be used (ensure MSDSs are available. Epoxies / cements - see chemicals at end	used in grouts, joints and sealants	Exposure to volatile noxious fumes and materials	3	3	3	27	Choice of products by PC to be approved by RE. Registers of products, training of workers prior to issue of products, Requirements of MSDS to be followed	2	3	2	12

Tender
Part C3: Scope of works Reference
No. ELS5837/2018/RFP

C3 - 180
Generic Specifications
Project Specific: Occupational Health and Safety Specification

C3.7

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SERIES 3000: EARTHWORKS AND PAVEMENT LAYERS OF GRAVEL OR CRUSHED STONE												
3100 / 3104 (b, d, f)	Use of Borrow pits, Quarries	> Contractor must be satisfied that all DMR requirements are met	Risks at source responsibility of quarry operator. A 37.2 agreement must be in place	3	3	3	27	Compliance with DMR requirements. Method statements and risk analyses, competent operators and supervision. Environmental monitoring, checking of plan and equipment and registers kept, by quarry/borrowpit operator	3	3	2	18
3207	Haulage of material in trucks, ride on compaction and grid rolling plant will be used. Workers exposed to whole body vibration.	Dust management, suppression, competent fit operators, daily registers for plant placed in H&S file	Risks inherent in the use of heavy machinery, dust, noise vibration, exposure to silica in dust. Worker struck by plant or tip truck, collisions.	3	3	3	27	Proper PPE for workers. Operators to be licensed and have Certificates of Competency Dust management, suppression, competent fit operators, daily registers for plant placed in H&S file	3	3	2	18
3208 / 3209 / 3310 / 3311 / 3312 / 3313	General Mass earthworks	Not included in Contract										
B3805	Milling of surface and base course	Use of milling machine, tipper trucks.	Risks inherent in the use of heavy machinery, dust, noise vibration, exposure to silica in dust. Worker struck by plant or tip truck, collisions. Possible pinch points on milling machine. Worker falls under milling machine	3	3	3	27	Increased changes in PPE to ensure visibility and limit dust inhalation. Storage areas to be controlled for temporary storage, dust suppression during mixing of materials and milling. Noise levels to be checked. Competent staff to operate milling machine.	3	3	2	18
3400 CR 23	Pavement layers of gravel material will be required. Gravel sub base to be chemically stabilised with cement and lime	Placement of gravel using tipper trucks and graders to place in position.	Risks inherent in the use of heavy machinery, dust, noise vibration, exposure to silica in dust. Worker struck by plant or tip truck, collisions.	3	3	2	18	Appointment of competent supervision and competent, fit operators. Method statements to be approved by RE, Risk assessments for the use of specialised plant.	2	3	2	12
3500	Layer works require stabilization with cement, Construction drawings will be provided for typical layouts	Placement of bags of cement, spread over road and mixed with base course by graders	Use of heavy plant, inhalation of cement dust, Skin contact with cement, noise, dust, Ergonomic risks in moving bags of cement	2	3	3	18	Method statements to be approved by RE, Risk assessments for the use of specialised plant, limit dust and health effects of cement. MSDSs for various products used. Use of PPE as needed	2	3	2	12
3806	Use of crushed base course G2 material obtained from commercial source or stockpile, and concrete/surfacing aggregate	tipping of gravel, spreading by grader and compaction by rollers	Risks inherent in the use of heavy machinery, dust, noise vibration, exposure to silica in dust. Worker struck by plant or tip truck, collisions.	3	3	3	27	All construction vehicles and plant fitted with Reverse alarms and sensors. Appointment of competent supervision and competent, fit operators. Method statements to be approved by RE, Risk assessments for the use of specialised plant.	2	3	2	12

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SERIES 4000: ASPHALT PAVEMENTS AND SEALS												
4101/ B46.01	MC 30 out-back Bituminous single seal with 13.2 mm aggregate and double slurry, Colprime E also specified. Cat 65 spray grade. 80/100 Penetration (hot) bitumen may be applied for the seal emulsion in tack coat and 30% cationic emulsion, surfacing aggregate - See end section for details of products specified	Hot bitumen sprayed by bitumen distributor, stone spread by mobile spread, emulsion based slurry (cold) spread by hand	Contact with hot bitumen, inhalation of fumes. Ergonomic problems. Worker struck by vehicle.	3	3	3	27	Medical surveillance, liver function testing, increased changes in PPE to ensure visibility and saturation of chemicals. First aid treatment for burns, level 3 first aiders, increased arrangements for emergencies. Storage areas to be controlled for temporary storage, dust suppression during mixing of materials. Rotate labour	3	3	2	18
4103/ B35.01	Distributor, rollers, chip spreader, watercart, slurry batcher, rotary brooms, hand tools. Tipper truck, tanker, distributor will most likely be used, to transport	Specialised team to do surfacing, may be contractor. Registers	Contact with hot bitumen, inhalation of fumes. Ergonomic problems. Worker struck by vehicle. Dust at slurry plant, noise	3	3	3	27	Competent personnel and supervision, method statements, approved H&S plan and procedures, including all associated documentation if contractor appointed; Level 3 first aid cover, burn emergency management. Registers for plant, daily checks	3	3	2	18
	Construction of asphalt berms	Hot bitumen used for mixing asphalt	Contact with hot bitumen, inhalation of fumes. Ergonomic problems. Worker struck by vehicle.	2	3	3	18	Competent personnel and supervision, method statements, approved H&S plan and procedures, including all associated documentation if contractor appointed; Level 3 first aid cover, burn emergency management. Registers for plant, daily checks	2	3	2	12
	PC may use Karoo mixer (stationary), mobile mixer, spreader box, some hand spraying in small areas will be required	Mixing emulsion, sand and cement to make slurry	Ergonomic problems. Worker struck by vehicle. Dust at slurry plant, noise, pinch points at conveyors, mixers	3	3	3	27	Competent supervision and operators; guarding of nip points and spindles/ belt drives; emergency stop button/ safe work procedures (SWPs)	3	3	2	18

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SERIES 5000: ANCILLARY ROADWORKS												
5100	Stone pitching will occur frequently throughout the project as erosion protection. Labour intensive work	Stone collected by hand and transported to site, laid in concrete matrix	Ergonomic problems. Worker struck by vehicle. Dust	2	3	2	12	Supply and approval of H&S documentation prior to commencement 7 days prior to work. Competent supervision, pre-task training, SWPs, Special transportation arrangements to site and from site. Rotation of labour, detailed in method statements and risk assessments	2	3	1	6
5200	Gabions, baskets will be pre made. Work will be on slopes, river banks and in cuttings. Stone will be delivered and baskets filled by hand. Ergonomic risk deemed high	Gabion baskets made up on site, placed and filled with stone	Ergonomic problems. Worker struck by vehicle. Dust. Minor injuries from stone and hand tools	2	3	2	12	Supply and approval of H&S documentation prior to commencement 7 days prior to work. All workers to be issued with neon green double dipped pvc gloves or similar. Rotation of labour picking and placing stones. Method statement to be submitted to address ergonomic issues	2	3	1	6
5400 / 5405	Guardrails be required along the route. Pre treated creosote, cut and drilled timber posts are specified.	Excavation of holes for support poles, placing of guard rails	Ergonomic problems. Worker struck by vehicle. Dust. Minor injuries from stone and hand tools	2	2	2	8	Supply and approval of H&S documentation prior to commencement 7 days prior to work. Competent supervision, pre-task training, SWPs, Special transportation arrangements to site and from site. No transportation with plant or materials on site. No transportation in open vehicles, adherence to Road Traffic Safety Act. Rotation of labour, detailed in method statements and risk assessments Issue of PPE for handling poles, daily registers for plant and portable electrical tools	2	2	1	4
5500	Appointment of an SMME for Fencing. Repair of existing fencing may occur. Gates may be required	Excavation of holes for fence posts, straining of barbed and smooth wire. Concrete to corner and straining posts. Erection of gates	Ergonomic problems. Worker struck by vehicle. Dust. Minor injuries from stone and hand tools. Worker struck by breaking wire	3	3	2	18	Supply and approval of H&S documentation prior to commencement 7 days prior to work. Competent supervision, pre-task training, SWPs, Special transportation arrangements to site and from site. No transportation with plant or materials on site. No transportation in open vehicles, adherence to Road Traffic Safety Act. Rotation of labour, detailed in method statements and risk assessments Rotation of labour, gloves appropriate for working with wire	2	3	2	12
5600	Use of SMME for the Erection and removal of road signs will be required along the route Timber poles, pre-cut and drilled specified	Approval of H&S plan - and systems by the SMME. Lifting of larger signs by crane truck, load testing, use of competent, fit o operators and supervision, use of ladders. Daily registers in H&S file	Ergonomic problems. Worker struck by vehicle. Dust. Minor injuries from stone and hand tools. Worker falls from ladder, sign falls on worker	2	2	2	8	Approval of H&S plan - and systems by the SMME. Lifting of larger signs by crane truck, load testing, use of competent, fit o operators and supervision, use of ladders. Daily registers in H&S file	2	2	1	4
5700 /	Appointment of an SMME for road marking. Retro Reflective road marking paint will be required, with road studs. Thermo-plastic lines will also be used.	Use of a Contractor at various stages of the project. Pre-marking by hand, Spray painting for marking. Sandblasting may be used	Ergonomic problems. Worker struck by vehicle. Dust. Minor injuries from stone and hand tools. Inhalation of fumes from paint, possible dermatitis from paint. Worker injury from sandblasting	3	2	3	18	H&S documentation by Contractors to be approved by Principal at least 7 days prior to commencement. PC to ensure work is done in closures still in situ and will remain responsible for all traffic accommodation requirements. Strict control will be applied, focus on high visibility.	3	2	2	12
5800	Appointment of an SMME for landscaping will be required. Hand seeding will be done in areas, as per the advice of Environmental consultant. Work will include rehabilitation at the quarry and borrow pits	Trimming batter slopes, grass seeding and watering. Fertilizing and installation of erosion protection	Ergonomic problems. Worker struck by vehicle. Dust. Minor injuries from stone and hand tools	2	2	2	8	H&S documentation by Contractors to be approved by Principal at least 7 days prior to commencement. Management of batter trimming, hydroseeder required. MSDSs, training of workers.	2	2	1	4
5900	Road reserve will be finished off to ensure adequate water run-off and finishing of work. Clearing of drains and storm water structures	Grading and shaping, windrows to be created. Competent supervision, fit, competent operators, daily registers	Risks inherent in the use of heavy machinery, dust, noise vibration, exposure to silica in dust. Worker struck by plant or tip truck, collisions.	2	2	2	8	Method statements and risk assessments for use of mechanical removal, noise management	2	2	1	4

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7100	7100 CONCRETE PAVEMENTS (WALKWAYS)												
	Clearing and Grubbing	Clearing by hand, use of small tools	Ergonomic risks, worker struck by pick or shovel, dust,	2	2	2	8	Method statements and risk assessments, dust management, Rotation of labour	2	2	1	4	
	Mixing and placing of concrete	Possible use of small concrete mixer or hand mixing, compaction of concrete	Worker caught in pinch point on mixer, Ergonomic risks, worker falls from access ramp	2	2	2	8	Method statements and risk assessments, dust management, Rotation of labour, Access ramp to be guarded.	2	2	1	4	
HAZARDOUS CHEMICAL SUBSTANCES SPECIFIED OR REQUIRED													
	Cement	Used across the project for a range of tasks, 50kg bags delivered on pallets, ergonomic risk from handling, dust exposure	exposure to cement dust, lung damage, dermatitis	3	3	2	18	Dust control, PPE(eye and respiratory) Use of distributor when stabilising road, Rotation of workers	2	3	1	6	
	Shutter oil	Usually hand application prior to placing formwork in position. Volatiles present	Exposure to volatiles	1	1	2	2	PPE - gloves for skin protection, adequate supervision	1	1	1	1	
	Prime MC 30	Required for surfacing preparation. Dangerous fumes. Burns, gas bottle explosion, fire	Exposure to volatiles, exposure to hot materials	3	3	3	27	Limit workers exposure and provide adequate protective clothing. First aid measures available, medical surveillance incl liver function testing. Consider use of emulsion type prime	2	3	2	12	
	Cape Seal - 80/100 penetration bitumen	Used on all surfacing	Exposure to volatiles, exposure to hot materials	2	2	2	8	Limit workers exposure and provide training, limit exposure, adequate protective clothing.	1	2	2	4	
	Bitumen (tack coat) (hot road grade) will be used in sprays and in various grades	Entire surface. Burns, gas explosion from gas bottles, fire. May be stored on site	Exposure to volatiles, exposure to hot materials	3	3	3	27	Limit workers exposure and provide Distributor to limit exposure, adequate protective clothing.	3	2	2	12	
	35 and 65% spray grade emulsions and 65% cationic stable-grade emulsions	Use over entire site, mainly an irritant to skin and respiratory centres. Although cold mix, volatiles are present.	Exposure to emulsion. Skin irritation	2	3	2	12	Limit workers exposure and provide Distributor to limit exposure, adequate protective clothing.	1	3	2	6	
	Retro-reflective Road paint	High levels of volatiles, while Contractors may be used, the Principal Contractor may do this himself. Products could have narcotic effect	Exposure to volatiles, ergonomic risks.	1	1	2	2	PPE - gloves for skin protection, adequate supervision. Masks should be worn during mixing process	1	1	1	1	
	Petrol/diesel/lubricants	Storage tanks on site. Fire, spillage, fumes	Worker exposed to volatiles, fire	2	3	2	12	Local supplier preferred for petrol, bund walls around diesel tanks, emergency plan, Hazardous chemical store for petrol and lubricants. Supervision. Permit from local municipality required	2	3	1	6	
	Herbicides and ant poison	Not specified, but will be used. Principal Contractor to ensure use of MSDSs and appropriate protection measures	AS MSDS	3	2	3	18	Appropriate PPE - skin, eye and face protection	2	3	2	12	
	Epoxies (including resins)	Not specified, but will be used. Principal Contractor to ensure use of MSDSs and appropriate protection measures	AS MSDS	2	3	2	12	Assess the availability of alternative products to limited the exposure to workers	2	3	1	6	
	Coatings	Not specified, but will be used. Principal Contractor to ensure use of MSDSs and appropriate protection measures	AS MSDS	2	2	2	8	Appropriate PPE - skin, eye and face protection	1	2	2	4	
	Grouts	Will be determined by the Principal Contractor, various grouts will be required, cementitious or other, may contain silica (crystalline - quartz), hexavalent chromium. Respiratory, skin and eye irritant	AS MSDS	3	3	3	27	Nitrile gloves, FF2 dust masks, eye protection required. Preferably use a single component epoxy system.	2	3	3	18	

Tender
Part C3: Scope of works Reference
No. ELS5837/2018/RFP

C3 - 184
Generic Specifications
Project Specific: Occupational Health and Safety Specification

C3.7

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OTHER ASPECTS CONSIDERED

	Weather is a factor to be considered, raised temperatures in summer, with high humidity levels. Flash floods could affect low lying areas, especially at structures. Temperatures can reach near freezing especially overnight	Working in wet, extreme cold or hot conditions	Work stoppage in rain or following rain that would affect the works. Cold weather protective clothing may become necessary Hot weather conditions may cause heat exhaustion sunburn and dehydration	3	3	2	18	Use of weather stations to monitor temperature. Work to be assessed should discomfort index reach 100, work may be stopped at 105 if deemed problematic. Adequate water intake. Monitoring of rainfall, not allowing work to occur downstream or low lying areas when threats of flooding. Adequate PPE such as sun hats to be provided if necessary	2	3	2	12
	Natural hazards	General work around site	Possibility of snake bite, bee stings and subsequent allergic reaction,	3	3	2	18	Worker induction to high light the dangers of site work	2	3	2	12
	Local labour and SMMEs will be used on the project, only core personnel are likely to be permanently employed	Appointment of local labour and SMMEs by local Project Steering Committee (PSC) and Community Liaison Officer (CLO)	inadequate local labour, improper training,	3	3	3	27	Mentoring following the identification of the appropriate Contractors. All workers to have medical screening to ensure fit for duty. Pre-qualification of SMMEs a prerequisite. H&S Plans to be approved at least 7 days prior to SMMEs commencing work	2	3	3	18

EXPOSURE TO NOISE

N-IH I Regs	Exposure to Noise	Over 85 Db for long period:When activities are in process	Hearing Loss	2	3	3	18	Specification to require establishment of noise zones by AIA.	2	2	2	8
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EXPOSURE TO DUST

	Exposure to Dust	If severe lack of clear vision; Breathing problems. When activities are in process	Loss of Lung Function	2	3	3	18	Specification to include dust palliative requirements.	2	2	2	8
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STACKING AND STORAGE

CR28	Stacking and Storage	Poor Storage of Materials and equipment	Physical injury –tripping and falling	3	2	2	12	Worker training. Experienced supervision by site staff and P.A. Competent inspection. Method statements	2	2	2	8
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PORTABLE ELECTRICAL TOOLS

	Use of small electrical tools	Contact with electricity	Electric shock	3	2	2	12	Ensure all connections secure, no breaks in cable. Proper routing of cables on site	3	2	1	6
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HOTWORK

	Welding operation	Contact with electricity / contact with gas	Incompetent operator / Defective Machinery . Burns / Injury to hand and eyes	3	3	3	27	Ensure operation by competent welders. Hazardous awareness training. All vessels and equipment to be inspected regularly. Registers to be kept	3	2	2	12
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ISSUE REGISTER

Date of Original Safety Specification Compilation	Compiled By	Issue Date	Revision Date

Acknowledgement:

I, _____representing
_____(Contractor), have satisfied myself with the content of this Health and Safety Specification and shall ensure that our employees and contractors on site comply with the requirements of this document, our safety documentation and health and safety legislation.

Signature of Contractor

Date

Comments:

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C3.7.2: ENVIRONMENTAL WORK INSTRUCTIONS**THE AIRPORTS COMPANY SOUTH AFRICA (ACSA) ENVIRONMENTAL SPECIFICATION**

It is a requirement of the Airports Company South Africa (ACSA)- that all construction works within Airports Company South Africa (ACSA) airports be undertaken in accordance with the Airports Company South Africa (ACSA) Environmental Specification

TABLE OF CONTENTS**INDEX****SECTION 1: AIRPORTS COMPANY SOUTH AFRICA (ACSA) - ENVIRONMENTAL SPECIFICATIONS OVERVIEW**

1. Purpose of the Environmental Specifications
2. Implementation of the Environmental Specifications
3. Structure of the Environmental Specifications

SECTION 2: AIRPORTS COMPANY SOUTH AFRICA (ACSA) ENVIRONMENTAL PARTICULAR SPECIFICATIONS

EP1	Introduction
EP2	Organisational Requirements
EP3	Method Statements
EP4	General Site Procedures
EP5	Site Clearance
EP6	Site Rehabilitation
EP7	Management and Monitoring
EP8	Measurement and Payment

LIST OF ABBREVIATIONS

(ACSA)	Airports Company South Africa
AEC	Airport Environmental Committee
EO	Environmental Officer
ES	Environmental Specification
EMS	Environmental Management System for Airports Company South Africa (ACSA)
ESA	Environmentally Sensitive Areas
SABS	South African Bureau of Standards
SAHRA	South African Heritage Resource Agency
SSSI	Sites of Special Scientific Interest

PART 1: AIRPORTS COMPANY SOUTH AFRICA (ACSA) ENVIRONMENTAL SPECIFICATIONS OVERVIEW

1. PURPOSE OF THE ENVIRONMENTAL SPECIFICATIONS

The purpose of the Environmental Specifications (ES) is to translate the recommendations of the Environmental Management System (EMS) into a contractual environmental specification for application during construction activities.

The Environmental Specifications will be applicable to all construction activities that occur on Airports Company South Africa (ACSA) owned and/or managed airports. Construction activities include construction of buildings, infrastructure as well as developer / tenant property and rehabilitation works at the airport.

2. IMPLEMENTATION OF THE ENVIRONMENTAL SPECIFICATIONS

The Environmental Specifications is intended for dissemination by Airports Company South Africa (ACSA) to the "Employer", who is the party for whom the construction works are to be executed (hereafter referred to as the Employer). The Employer may therefore be Airports Company South Africa (ACSA) (the relevant Departmental Manager responsible for construction activities), a tenant or a developer with a land lease or another party such as a contractor responsible for developing or rehabilitation of the site or sites at the airport.

The Employer shall ensure that the Environmental Specification is included in the Tender Document(s) issued to the prospective Contractor and is also responsible for appointing/designating, in writing, a Responsible Person for the construction works.

The Responsible Person would manage the requirements outlined in the Environmental Specifications on behalf of the Employer. The Contractors shall incorporate the requirements of the ES in their tender submissions to the Employer and are responsible for implementing the ES on a daily basis.

The Environmental Officer (EO) will be responsible for updating the ES as required, auditing the implementation of the ES for each construction project and for maintaining the document control and record systems associated with it.

The Environmental Specifications report has been structured to be incorporated into a standard engineering tender document as the Environmental Particular Specification.

A 'Particular Specification' is the terminology used for a specification that covers activities that are not adequately covered in the standardised SABS 1200 series specifications for engineering contracts, or where the specification is sufficiently detailed to make it inappropriate for inclusion as a variation or addition to a standardised specification.

The Environmental Specification is a generic document applicable to construction projects at all Airports Company South Africa (ACSA) airports. The majority of the specifications within the ES will apply to all construction work, although it is anticipated that variations to this specification may need to be included for some specific developments. Variations would be made by the Environmental Officer, prior to the issue of the ES to the Employer.

PART 2: ENVIRONMENTAL Particular SPECIFICATIONS***Index to Environmental Particular (EP) Specifications***

Clause	Description
EP1	INTRODUCTION
EP2	ORGANISATIONAL REQUIREMENTS
EP2.1	Organisational overview and structure
EP2.2	Roles and responsibilities
EP3	METHOD STATEMENTS
EP4	GENERAL SITE PROCEDURES
EP4.1	Demarcation of Environmentally Sensitive Areas (ESAs)
EP4.2	Location of camp and depot
EP4.3	Demarcation of the site
EP4.4	Ablution Facilities
EP4.5	Domestic waste water
EP4.6	Refuse
EP4.7	Protection of the fauna and flora
EP4.8	Defacement of natural features
EP4.9	Protection of archaeological and paleontological sites
EP4.10	Effluent and storm-water management
EP4.11	Dust control
EP4.12	Noise control
EP4.13	Materials use, handling, storage and transport
EP4.14	Emergency procedures
EP4.15	Social issues
EP5	SITE CLEARANCE
EP5.1	Removal of top soil
EP5.2	Stabilisation of steep slopes
EP5.3	Removal of alien vegetation
EP6	SITE REHABILITATION
EP6.1	Scope
EP6.2	Landscaping and preparation for re-vegetation
EP7	MANAGEMENT AND MONITORING:
EP7.1	Monitoring and reporting
EP7.2	Environmental awareness training
EP7.3	Non-conformance and corrective actions
EP7.4	Documentation
EP7.5	Incentives and penalties
EP7.6	External audit
EP7.7	Airports Company South Africa (ACSA) Service & Maintenance Contractors Environmental Terms and Conditions to Commence Work - EMS 048
EP8	MEASUREMENT AND PAYMENT

EPI INTRODUCTION

The ES has been prepared and is to be implemented as part of the Environmental Management Systems for Airports Company South Africa (ACSA).

The ES provides specifications that the Contractor shall adhere to, in order to minimise adverse environmental impacts and optimise opportunities associated with construction activities.

The ES is provided to the Contractor at the tender stage so that the costs of implementing the ES are included into the contract cost and so that the Contractor is aware of his environmental responsibilities before commencing work.

The aim of this ES is to ensure that environmental management of site activities is integrated into the other management systems implemented by the Contractor (e.g. quality management, health and safety). For this reason, the ES includes a requirement for the Contractor(s) to develop their own system (i.e. roles, responsibilities and timing) for ensuring that the requirements of the ES are met, and that the Contractor checks, by means of an internal audit, that this system is operating effectively.

EP2 ORGANISATIONAL REQUIREMENTS

EP2.1 Organisational Structure

This section outlines the required management structure for the administration of the ES, with particular emphasis on the roles and responsibilities of key individuals.

The organisational structure for the implementation of the ES is presented in Figure 1 and should be viewed in conjunction with the roles and responsibilities below.

EP2.2 Roles and responsibilities

EP2.2.1 Airports Company South Africa

Airports Company South Africa is ultimately responsible for ensuring effective environmental management at the airport in terms of the scope of the Environmental Management Systems.

EP2.2.2 Environmental Officer (EO)

The Environmental Officer has been appointed by Airports Company South Africa (ACSA), and is responsible for monitoring the implementation of the requirements of the Environmental Specification by the relevant parties as specified.

The Environmental Officer shall:

- Review and approve in writing valid method statements;
- Inspect the Contractor's site to check compliance with method statements and the requirements of the ES (at least weekly and more frequently if thought to be warranted by the EO) and maintain inspection reports on file;
- Meet with the Responsible Person for the developer or tenant, whereby the Responsible Person reports on the implementation of the ES (at least monthly) and keep a record of minutes of the above meetings;
- Provide material / manuals and assistance to the Responsible Person for the initial environmental training sessions; and
- Report in writing any problems related to conformance with the ES which cannot be resolved in co-operation with the relevant Responsible Person to Airports Company South Africa (ACSA) Managers or the relevant developer / tenant.

EP2.2.3 Employer

The Employer shall:

Tender	C3 - 192	C3.7
Part C3: Scope of work Reference		Generic Specifications
No. ELSS837/2018/RFP		Environmental Work Instructions

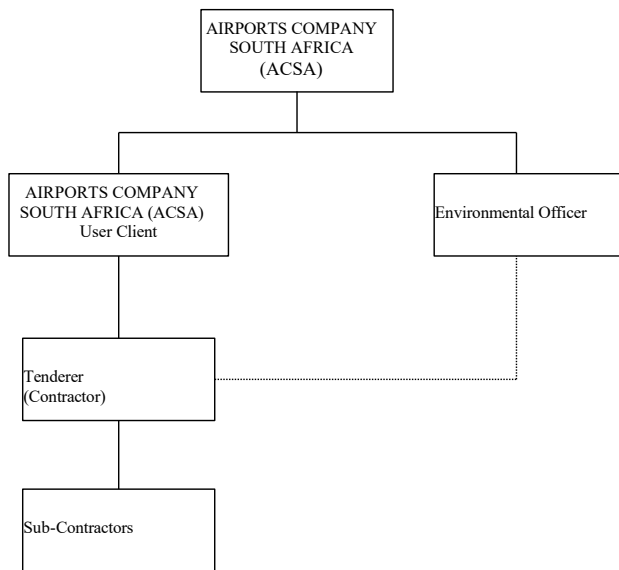
- Include the ES, with any revisions, in any tender document related to construction activities on site;
- Designate in writing a Responsible Person for the proper implementation of the ES; and
- Send a copy of the letter of appointment of the Responsible Person to the EO.

EP2.2.4 Responsible Person

The Responsible Person for each building site or infrastructure installation shall:

- Develop a system to ensure that the ES is effectively implemented;
- Audit this system so that he/she can demonstrate to the EO that the ES is being effectively implemented;
- Ensure that Contractors staff, sub-contractors, suppliers etc. receive appropriate environmental awareness training prior to commencement of work on the project and maintain records of training. It is anticipated, though not a requirement, that the Responsible Person will deliver training sessions;
- Ensure that responsible persons for sub-contractors are designated to carry out the requirements of the Environmental Specifications
- Submit method statements to the Environmental Officer for approval as specified in the Environmental Specifications and maintain approved method statements on file; and
- Have sufficient authority to issue site instructions to the Contractors staff on their site. It is probable, though not a requirement, that the Responsible Person will be the Engineers Representative.

Figure 1: Organisational structure showing lines of responsibility and communication during the construction phase at the airport.



EP3 METHOD STATEMENTS

The Contractor shall submit a written method statement to the Responsible Person for approval, covering those activities which are identified (in this document and/or by the Environmental Officer), as being potentially harmful to the environment.

Method statements indicate how compliance with the Environmental Particular Specification will be achieved. The method statement shall state clearly:

- timing of activities;
- materials to be used;
- equipment and staffing requirements;
- the proposed construction procedure designed to implement the relevant environmental specifications;
- the system to be implemented to ensure compliance with the above; and
- other information deemed necessary by the Environmental Officer and Responsible Person.

The method statement shall be submitted at least five working days prior to expected commencement of work on an activity, to allow the Responsible Person time to study and approve the method statement. The contractor shall ensure Airports Company South Africa (ACSA) that the activity is conducted according to the method statement which will be approved in writing by the Airports Company South Africa (ACSA) successful tenderer (and also signed by the Airports Company South Africa (ACSA) Environmental Officer), which shall be done within five working days of receipt.

Due to changing circumstances, it may be necessary to modify method statements. In such cases, the proposed modifications must be indicated and agreed upon in writing between the Environmental Officer and Responsible Person. The EO and Responsible Person must retain records of any amendments and ensure that the most current version of any method statement is being used.

EP4 GENERAL SITE PROCEDURES**EP4.1 Demarcation of Environmentally Sensitive Areas**

Before construction commences there needs to be confirmation by Airports Company South Africa (ACSA)'s Environmental Officer that the vegetation in the area to be impacted by construction activities is not identified as an Environmentally Sensitive Area (ESA). However, should Environmental Sensitive Areas be identified during the construction period the following actions would have to be taken to minimize adverse impacts:

- Environmentally Sensitive Areas, shall not be entered or used for any purpose unless a written motivation has been submitted to the EO by the Responsible Person, and written approval has been obtained from the EO;
- The Contractor shall exercise special care when working close to the ESA's in order to avoid damage or physical disturbance of these areas. The EO may instruct the Responsible Person to restrict the number of construction personnel and equipment operating near Environmentally Sensitive Areas (ESA's);
- Damage caused to ESAs by the Contractor shall be cause for the Contractor to make good any damaged areas to the written satisfaction of the EO;
- The Contractor shall note the proximity to the site of any designated ESAs. The Contractor shall fence any ESAs located within 20-m of the site boundary. The fencing shall extend along the boundary of the ESA for sufficient distance to ensure that the location of the ESA is obvious from the Contractor's site and from the approach to the Contractor's Site; and
- The Contractor shall make provision for the demarcation of ESAs with fencing to the following specifications:

Posts shall be wooden droppers or steel standards where the ground is too hard for wooden droppers to be driven in;

- The posts shall be long enough and spaced closely enough to support a strand of 12-gauge wire at 750- mm above the ground level; and
- The top 300-mm of the posts shall be painted white for easy visibility.

EP4.2 Location of camp and depot

The Contractor's Camp and Materials Storage Area shall be located at a position approved by the Responsible Person. No site staff other than security personnel shall be housed on site.

The Contractor shall provide water and/or washing facilities at the Contractor's Camp for personnel. The

Contractor's Camp and Materials Storage Area shall be kept neat and tidy and free of litter.

EP4.3 Demarcation of the site

It is important that activities are conducted within a limited area to facilitate control and to minimise the impact on the existing natural environment, existing tenants and other construction activities in the vicinity and public thoroughfares.

The Contractor shall demarcate the boundaries of the site in order to restrict his construction activities to the site. The method of demarcation and the location of the demarcated area shall be determined by the Contractor and approved by the Responsible Person before any work being undertaken. The Contractor shall ensure that all plant, labour and materials remain within the boundaries of the site. Failure to do so may result in the Contractor being required to fence the boundaries of the site at his/her own expense to the satisfaction of the Responsible Person.

If additional areas (e.g. for lay down, rest areas) are required, these must be approved in writing by the Responsible Person. The Contractor is advised that it may take approximately one week to obtain such permission from the Responsible Person.

Suitable temporary fencing may need to be erected during construction to minimise the risk of injury to the public, and animals.

EP4.4 Ablution Facilities

The Contractor shall provide the necessary ablation facilities for all his personnel.

Toilets with chemical disinfectants shall be provided, with a minimum of one toilet per 15-persons. Toilets shall be easily accessible and shall be transportable. The toilets shall be secured to prevent them from blowing over, and shall be provided with an external closing mechanism to prevent toilet paper from being blown out. Toilet paper dispensers shall be provided in all toilets. Toilets shall be cleaned and serviced regularly by a reputable toilet servicing company. Toilets shall be emptied before long weekends and builders' holidays.

The Contractor shall ensure that chemicals and/or waste from toilet cleaning operations are not spilled on the ground at any time. Should there be repeated spillage of chemicals and/or waste (i.e. more than three incidents), the EO shall require the Contractor to place the toilets on a solid base with a sump at his own expense. Accumulations of chemicals and waste will have to be removed from the site and disposed at an approved waste disposal site or sewage plant.

Abluting anywhere other than in the toilets shall not be permitted. Repeated use of open areas, rivers or other areas for ablation purposes (i.e. more than three incidents) may result in the guilty party being given a spot fine. The Contractor shall also be responsible for cleaning up any waste deposited by his personnel.

EP4.5 Domestic waste water

Waste-water from any other ablation or kitchen facilities on site shall be discharged into a suitable conservancy tank. The Contractor shall be responsible for ensuring that the system continues to operate effectively throughout the project and that the conservancy tank is emptied as required during the project. The Contractor shall employ a suitable qualified sub-contractor or the local authority to empty the conservancy tank.

EP4.6 Refuse

Refuse refers to all solid waste, including construction debris (e.g. wrapping materials, timber, cans etc.) waste and surplus food, food packaging etc.

The Contractor shall institute an on-site waste management system that is acceptable to the Responsible Person in order to prevent the spread of refuse within and beyond the site. The Contractor is reminded that wind velocities on the construction site can be extremely high.

All waste shall be collected and contained immediately. The Contractor shall institute a weekly clean-up of the site if so instructed by the Responsible Person. This daily/weekly clean up shall be for the Contractor's account.

The Contractor shall not dispose of any waste and/or construction debris by burning or burying. The use of waste bins and skips is recommended. The bins shall be provided with lids and an external closing mechanism to prevent their contents from blowing out. The Contractor shall ensure that all waste is deposited by his employees in the waste bins for removal by the Contractor. Bins shall not be used for any purposes other than waste collection and shall be emptied on a regular basis. All waste shall be disposed of off-site at approved landfill sites.

Waste generated at the construction camps shall be separated into recyclable and non-recyclable waste, and shall be separated as follows:

- Hazardous waste (including used oil, diesel, petrol tins, paint, bitumen, etc.);
- Recyclable waste (paper, tins, glass);
- General waste; and
- Reusable construction material

Recyclable waste shall be deposited in separate skips/bins and removed off-site for recycling. The Contractor may wish to enter into an agreement with the surrounding communities and/or his staff with regard to the collection and sale of recyclable and reusable materials.

Hazardous waste, including waste oil and other chemicals (e.g. paints, solvents) shall be stored in (an) enclosed area(s), and shall be clearly marked. If deemed necessary by the Responsible Person, the Contractor shall obtain the advice of a specialist waste expert concerning the storage of hazardous waste. Such waste shall be disposed of off-site by a specialist waste contractor, at a permitted hazardous waste disposal site.

The EO shall be consulted about, and agree to, the method of storage and disposal of hazardous waste.

The Contractor is advised that spot fines for littering have been included in this document. Offenders found littering will be liable for a spot fine.

EP4.7 Protection of fauna and flora

All fauna within and around the site shall be protected. Birds and animals shall not be caught or killed by any means, including poisoning, trapping, shooting or setting of snares. Offenders may be prosecuted in terms of the Animals Protection Act 71 of 1962.

EP4.8 Defacement of natural features

Defacement of any features outside of the construction site shall not occur without the prior written permission of the Responsible Person. Any features defaced by the Contractor shall be restored to the satisfaction of the Responsible Person.

EP4.9 Protection of archaeological and palaeontological Sites

If any possible palaeontological /archaeological material is found during excavations, the Contractor shall stop work immediately and inform the Responsible Person. The Responsible person will inform the South African Heritage Resource Agency (SAHRA) and arrange for a palaeontologist/archaeologist to inspect, and if necessary

excavate, the material, subject to acquiring the requisite permits from the National Monuments Council. Costs incurred will be for the Employer's account.

EP4.10 Effluent and storm-water management

EP4.10.1 General

The Contractor must ensure that pollution of the ground or surface water does not occur as a result of site activities. Pollution could result from the accidental release of contaminated run-off from construction camps, discharge of contaminated construction water, chemicals, oils, fuels, sewage, run-off from stockpiles, solid waste, litter, etc.

EP4.10.2 Run off from construction camps

The Contractor shall ensure that polluted run-off (excluding silt "pollution"), such as run-off from construction camps where equipment is cleaned and/or serviced, fuel stores, workshops, etc. is not discharged overland. The Contractor may direct it into the local sewerage main, with the written permission of the Responsible Person. Alternatively, the Contractor shall erect an earth/brick berm 0,5 m high around such areas and shall collect all run-off from these areas and store it in a conservancy tank for removal from the site. The Contractor shall ensure that silt-laden water is not discharged directly into any surface watercourses (i.e. vlei area, etc.), and shall take suitable measures to prevent this.

Natural run-off shall be diverted away from any camps towards the storm-water drains where these are available. Special care must be taken in areas susceptible to erosion, e.g. steep slopes. The Contractor shall ensure that excessive quantities of sand, silt and silt-laden water do not enter the storm-water drain system, or any surface watercourse. The Contractor shall take appropriate measures, e.g. the erection of silt traps, or drainage retention areas, to prevent silt and sand entering drainage or watercourses. Any partial or complete blockage of the storm-water drainage system shall be cleared by the Contractor at his / her own expense.

EP4.10.3 Discharge of construction water

Construction water refers to all water dirtied as a result of construction activities.

The Contractor may discharge silt laden water overland and allow this water to filter into the ground. However, s/he shall ensure that he does not cause erosion as a result of any overland discharge.

The Contractor may discharge limited quantities (less than 50L) of cement-laden water overland, i.e. washings from trowels, wheelbarrows and the like.

Water from washing large concrete-mixing equipment (mixers and the like) shall not be discharged overland. Such water shall be collected in a conservancy tank, removed from the site and disposed of in the correct manner. The Contractor may consider reusing such water for washing other concrete equipment to minimise the amount required to be removed off-site.

Trucks delivering concrete shall not wash the trucks or the chutes on the site. All washing operations shall take place off-site at a location where wastewater can be disposed of in the correct manner.

EP4.10.4 Servicing/fuelling of construction equipment

Servicing and fuelling should preferably occur off-site.

However, if these activities occur on site, the Contractor shall ensure that all servicing of vehicles and equipment takes place in designated areas agreed upon by the Responsible Person. All waste shall be collected and disposed of off-site at an appropriately licensed landfill site. All equipment that leaks onto the ground shall be repaired immediately or removed.

Similarly, no vehicles or machines shall be refuelled on site except at designated refuelling locations, unless otherwise agreed with the Responsible Person. The Contractor shall not change oil or lubricants anywhere on

site except at designated locations, except if there is a breakdown or an emergency repair. In such instances, the Contractor shall ensure that he has Drizit pads (or equivalent) and/or drip trays available to collect any oil, fluid, etc.

EP4.10.5 Fuels and chemicals

The Contractor shall take all reasonable precautions to prevent the pollution of the ground and/or water resources by fuels and chemicals as a result of his activities.

The Contractor shall keep the necessary materials and equipment on site to deal with ground spills of any of the materials used or stored on site.

The Contractor shall ensure that no oil, petrol, diesel, etc. is discharged onto the ground. Pumps and other machinery requiring oil, diesel, which is intended to remain in one position for longer than two days shall be placed on drip trays. The drip trays shall be emptied regularly and the contaminated water disposed of off-site at a facility capable of handling such wastewater. Drip trays shall be cleaned before any possible rain events that may result in the drip trays overflowing, and before long weekends and holidays.

The Contractor shall remove all oil-, petrol-, and diesel-soaked sand immediately and shall dispose of it as hazardous waste.

Should the Responsible Person/ECO and/or the relevant authorities deem it necessary to institute a programme for the removal of contaminated ground resulting from the non-compliance of the controls detailed above, these costs will be for the Contractor's account. Remedial action shall be approved by the ECO and relevant authorities, if appropriate.

EP4.11 Dust control

The Contractor shall be responsible for the continued control of dust arising from his/her operations, through measures including, but not limited to, spraying of water on bare areas, rotovating straw bales into the soil surface and the scheduling of dust-generating activities to times when wind velocity is low. Overhead sprayers shall not be used in windy conditions, due to water loss through evaporation. The use of water carts is preferred.

The Contractor shall inform the Responsible Person 48 hours in advance of anticipated "unavoidable" dust-generating activities. The Responsible Person and/or ECO may inform adjacent land users, tenants and communities about the possibility of dust pollution, and the approximate duration of the problem.

EP4.12 Noise control

The Contractor shall take all reasonable precautions to minimise noise generated on site as a result of his operations, especially when working in areas or on activities that may impact on neighbouring land users.

The Contractor shall comply with the applicable regulations with regard to noise.

The Contractor shall inform the Responsible Person 48-hours in advance of anticipated "unavoidable" noise-generating activities. The Responsible Person and/or Environmental Officer may inform adjacent land users, tenants and communities about the possibility of noise pollution and the approximate duration of the problem.

EP4.13 Materials use, handling, storage and transport

Procedure for material handling must be discussed with and approved by the Responsible Person prior to commencement of this activity.

EP4.13.1 Use of cement/concrete

The Contractor is advised that cement and concrete are regarded as highly hazardous to the natural environment on account of the very high pH of the material, and the chemicals contained therein. Therefore the Contractor shall ensure that:

- concrete is mixed on mortar boards, and not directly on the ground;
- visible remains of concrete, either solid, or from washings, are physically removed immediately and disposed of as waste. Washing visible signs into the ground is not acceptable; and
- all aggregate is also removed.

EP4.13.2 Fuel storage and use

Tanks containing fuels shall have lids and shall remain firmly shut. Only clean, empty tanks may be stored on the bare ground. Fuel stores shall be placed on a bunded sealed base - the bunds shall have a volume of 110% of the volume of the largest tank in the storage area. Any waste-water or spilled fuel collected within the bund shall be disposed of as hazardous waste.

The Contractor shall take all the necessary precautions to prevent fires or spills. No smoking shall be allowed in the vicinity of the fuel stores. Failure to adhere to this specification shall be cause for a spot fine being imposed on the offender.

The Contractor shall ensure that there is adequate fire-fighting equipment at the fuel stores.

EP4.13.3 Hazardous materials

The Contractor shall comply with all relevant national, regional and local legislation with regard to the transport, use and disposal of hazardous materials. If necessary, the Contractor shall obtain the advice of the manufacturer with regard to the safe handling of hazardous materials. Any claims against the Contractor shall be for his/her account.

The Contractor shall provide the Responsible Person with a list of hazardous substances on site, together with storage procedures for these materials.

The Contractor shall ensure that there is an emergency procedure to deal with accidents and incidents (e.g. spills) arising from hazardous substances. The Contractor shall report major incidents (spills in excess of 50 litres) to the Responsible Person immediately.

The Contractor shall maintain a register of spills or incidents involving hazardous materials, as well as measures taken.

The Contractor shall ensure that information on all hazardous substances is available to all personnel on site. The Contractor shall furthermore be responsible for the training of all personnel on site who will be handling the material about its proper use, handling and disposal.

EP4.13.4 Transport of materials outside the site

The Contractor shall comply with all the applicable local, regional and national by-laws with regard to road safety and the transport of materials, especially hazardous and/or toxic materials. Any claims against the Contractor shall be for his account.

The Responsible Person shall provide the Environmental Officer with a schedule of the proposed transportation of significant quantities of hazardous material onto the site, before commencing work on site. The Environmental Officer may request further details or notifications of specific material movements if considered necessary.

EP4.14 Emergency procedures

EP4.14.1 General

The Contractor shall ensure that emergency procedures are set up prior to commencing work. Emergency procedures shall include, but are not limited to, fire, spills, contamination of the ground, accidents to employees, use of hazardous substances, etc. Emergency procedures, including responsible personnel, contact details of emergency services, etc. shall be made available to all the relevant personnel and shall be clearly demarcated at the relevant locations around the site.

Confidential

The Responsible Person shall advise the EO of any emergencies on site, together with a record of action taken.

EP4.14.2 Fire

The Contractor shall take all the necessary precautions to ensure that fires are not started as a result of his/her activities on site, and shall also comply with the requirements of the Occupational Health and Safety Act 85 of 1993.

No open fires shall be permitted on or off-site. Closed fires or stoves shall only be permitted at designated safe sites in the construction camps. Fires shall also not be permitted near any potential sources of combustion, such as fuel stores, stockpiles of plant material etc.

The Contractor is advised that sparks generated during welding, cutting of metal or gas cutting can cause fires. Every possible precaution shall therefore be taken when working with this equipment near potential sources of combustion. Such precautions include having an approved fire extinguisher immediately available at the site of any such activities.

The Contractor shall be liable for any expenses incurred by any organisations called to assist with fighting fires, and for any costs relating to the rehabilitation of burnt areas.

EP4.15 Social issues

EP4.15.1 Third party or public complaints

The Environmental Officer shall be responsible for responding to queries and/or complaints and may request assistance from the Responsible Person in this regard.

The Environmental Officer shall notify the Responsible Person of any complaints lodged by a third party, and request appropriate information and measures to address such complaints. The Environmental Officer shall be responsible for maintaining a complaints register in which all complaints are recorded, as well as action taken. This register shall be available to the Responsible Person and the Contractor on request.

EP4.15.2 Information sharing

The Responsible Person and/or the Contractor may need to make staff available for formal consultation with affected parties for the purpose of explaining the construction process and answering queries if necessary.

EP5 SITE CLEARANCE

EP5.1 Removal of topsoil

Following removal of vegetation from the site, all topsoil shall be removed (up to a maximum of 30-cm depth) and stock-piled for re-use in subsequent rehabilitation and landscaping activities. The stockpiles shall not be higher than 2-m in order to minimise composting. The stockpiles of topsoil shall be located in an area agreed with the Responsible Person.

EP5.2 Stabilisation of steep slopes

The disturbance of steep slopes, for example by the removal of vegetation, may result in slope instability and erosion by rain and surface run off. The Contractor shall ensure that slopes that are disturbed during construction are stabilised to prevent erosion occurring. Where re-vegetation of slopes is undertaken, this shall be in accordance with the specification provided in EP6.

Slopes that are susceptible to accidental damage during construction shall be protected to reduce the risk of disturbance.

Any erosion that does occur must be reinstated at the Contractor's cost.

EP5.3 Removal of alien vegetation

The Contractor shall clear all alien vegetation from areas within the demarcated site that are to be landscaped or which fall within open space or buffer zones (e.g. pipeline routes, road fringes).

EP6 SITE REHABILITATION

EP6.1 Scope

The Contractor shall be responsible for rehabilitating any areas cleared or disturbed for construction purposes that are to be incorporated into open space or buffer zones. The Contractor shall re-vegetate such areas in accordance with the specification provided below.

The Contractor shall stabilise, by straw rot ovation or other means, any areas that are cleared or disturbed for construction purposes which are not going to be incorporated into open space or buffer zones (i.e. areas that will be subsequently developed by another party).

All construction equipment and excess aggregate, gravel, stone, concrete, bricks, temporary fencing and the like shall be removed from the site upon completion of the work. No discarded materials of whatsoever nature shall be buried on the site or on any other land not owned by Airports Company South Africa (ACSA).

EP6.2 Landscaping and preparation for re-vegetation

Areas that require reshaping shall be cut, filled and compacted so as to follow the contours of the surrounding landscape. Topsoil removed from the area initially shall be replaced. Care must be taken not to mix the topsoil with the subsoil during shaping operations. Should a crust form on the soil before re-vegetation is commenced, the Contractor shall, at his own cost, loosen the crust by scarifying to a depth of 150-mm.

EP7 MANAGEMENT AND MONITORING

This section focuses on the systems and procedures required to ensure that the environmental specifications are effectively implemented. The emphasis is on monitoring, training and penalties/incentives aimed at ensuring compliance with this document. Suitable documentation and external checks are crucial to ensure compliance and methods to achieve this are also presented in this section.

EP7.1 General Inspection, Monitoring and Reporting

The Responsible Person shall:

- Inspect the site on a daily basis to ensure that the environmental specifications are adhered to.
- Provide the Environmental Officer with a monthly written report, detailing both compliance with the Environmental Specifications as well as general environmental performance.
- Maintain a record of major incidents (spills, impacts, complaints, legal transgressions etc) as well as corrective and preventive actions taken, for submission to the Environmental Officer at scheduled monthly report back meetings.
- Conduct regular internal audits to ensure that the system for implementation of the ES is operating effectively. The audit shall check that a procedure is in place to ensure that:
 - the Method Statements and Environmental Specifications being used are the up-to-date versions;
 - variations to the Environmental Specifications/Method Statements and non-compliances and
 - corrective action are documented;
 - appropriate environmental training of personnel is undertaken; and
 - emergency procedures are in place and effectively communicated to personnel.

- Provide the required information to the Environmental Officer during external audits conducted, as part of the Environmental Management Systems auditing procedure. The information required will include the reports of internal audits conducted by the Responsible Person.

EP7.2 Environmental awareness training

EP7.2.1 Environmental awareness training prior to commencing work

An initial environmental awareness training workshop shall be held prior to any work commencing at the airport. The Responsible Person shall organise (deliver) the workshop and will record the names of those attending. It is recommended that the Contractor allow one hour for this workshop. The workshop shall be attended by all site staff, including sub-contractor's staff.

The Contractor is responsible for ensuring that personnel commencing work on site after the start of the contract (who therefore miss the initial workshop) are also made aware of the environmental procedures before commencing work.

The emphasis should be on any (potential) environmental impacts relating to the construction activities to be undertaken on site and the related environmental precautions, which need to be taken to avoid or mitigate these impacts. The contractual obligation to comply with the specifications in the Environmental Specifications must also be emphasised (some training material will be specific to certain sites or tenders).

A general environmental awareness programme aimed at all employees of the Contractor, sub-contractors and suppliers is available from the Environmental Officer.

EP7.2.2 Additional environmental awareness sessions

If there are persistent breaches of the specifications contained in the Environmental Specification and/or if new environmental issues arise during the course of construction, the Environmental Officer may require additional environmental training sessions. Attendance at these sessions will be determined by the EO, in consultation with the Responsible Person. The Contractor shall make provision for one hour a month for attendance (of construction staff) at these meetings.

EP7.3 Documentation

The Responsible Person shall ensure that all records of spills, pollution incidents, spot fines, training details etc. are copied to the Environmental Officer for his/her records. All documents shall be open for inspection by the Airport Environmental Committee (AEC).

The Environmental Officer shall ensure that a register of public complaints and action taken thereon, plus the relevant documentation from the Contractors, is maintained.

EP7.4 Incentives and penalties

EP7.4.1 Incentives

The Environmental Officer may identify a Contractor that is best implementing this Environmental Specifications and may make a (monthly) award to, or acknowledge, that Contractor.

EP7.4.2 Penalties

Spot fines shall be imposed by the Environmental Officer on Contractors who are found to be infringing these specifications. The Contractor shall be advised in writing of the nature of the infringement and the amount of the spot fine, and furthermore the Contractor shall determine how to recover the fine from the relevant employee and/or sub-contractor. The Contractor shall also take the necessary steps (e.g. training) to prevent a recurrence of the infringement and shall advise the Environmental Officer accordingly.

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The Contractor is also advised that the imposition of spot fines does not replace any legal proceedings by the Council, authorities, land owners and/or members of the public may institute against the Contractor.

Spot fines shall be between R500 and R2000, depending upon the severity of the infringement. The decision on how much to impose will be made by the Environmental Officer, and will be final. In addition to the spot fine, the Contractor shall be required to make good any damage caused as a result of the infringement at his/her own expense.

A preliminary list of infringements for which spot fines will be imposed is as follows:

- moving outside the demarcated site boundaries;
- littering of waste on site and surrounds and burying waste on site and surrounds;
- smoking in the vicinity of fuel storage and filling areas and in any other areas where flammable materials are stored/used;
- making fires outside designated areas;
- defacement of natural features;
- spillage onto the ground of oil, diesel, etc;
- picking/damaging plant material;
- damaging/killing wild animals; and
- additional fines as determined by the Environmental Officer.

The Responsible Person may also order the Contractor to suspend part or all the works if the Contractor repeatedly causes damage to the environment by not adhering to the ES (i.e. more than 3 cases of infringements). The suspension will be enforced until the offending actions, procedure or equipment is corrected. No extension of time will be granted for such delays and all costs will be borne by the Contractor.

EP7.5 External audit

Regular scheduled audits of the EMS will be conducted. However, this is not a dedicated audit of the implementation of this document (which is one of many components of the EMS). Nevertheless, it is anticipated that implementation of the terms and specifications contained in this document will be periodically audited as part of the EMS audit.

All documentation held by the Environmental Officer shall be available for the EMS audit at all times. Contractors shall also be required to provide any information required by the EMS auditors.

EP7.7 AIRPORTS COMPANY SOUTH AFRICA (ACSA) Service & Maintenance Contractors 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 Airports Company South Africa (ACSA). Airports Company South Africa (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	Airports Company South Africa (ACSA)'s Environmental Policy shall be communicated, comprehended and implemented by all Airports Company South Africa (ACSA) appointed contractor staff (see attached Environmental Policy).
Stormwater, Soil and Groundwater Pollution	<ul style="list-style-type: none"> No solid or liquid material may be permitted to contaminate or potentially contaminate stormwater, soil or groundwater resources. Any pollution that risks contamination of these resources must be cleaned-up immediately. Spills must be reported to Airports Company South Africa (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 Airports Company South Africa (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	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 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: <ol style="list-style-type: none"> The name of the contracting waste company Waste disposal site used Monthly reports on quantities - separated into general, hazardous and recycled Maintained file of all Waste Manifest Documents and Certificates of Safe Disposal Copy of waste permit for disposal site <p>This information must be available during audits and inspections.</p>
Handling & Storage of Hazardous Chemical Substances (HCS)	<ul style="list-style-type: none"> 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. All spillages of HCS must be cleaned-up immediately and disposed of as hazardous waste. (HCS spillages must be reported to Airports Company South Africa (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	Airports Company South Africa (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.

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Penalties

Penalties shall be imposed by Airports Company South Africa (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 Airports Company South Africa (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 Airports Company South Africa (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 Airports Company South Africa (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).

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AIRSIDE PROJECT/WORK SAFETY PLAN

(OHS and Environmental Safety Plans to be submitted separately) Contractor:

Project/work:

Airports Company South Africa (ACSA) Dept.

- 1 Disruption to normal operations (Minimise)**
 - a. Hours of work
 - b. Information to Stakeholders in writing
 - c. NOTAM
- 2 Access**
 - a. Access point and route
 - b. Marking of Route
 - c. Movement area crossing points
 - d. Vehicle / Equipment control
 - e. Communication facilities
 - f. Escorts
- 3 Height restrictions**
 - a. Vehicles / Cranes
 - b. Operating heights of crane jibs
- 4 Aircraft movement area inspections : F&RS/Airside Safety**
 - a. Frequency
 - Areas open to a/c use
 - Areas closed to a/c use
 - b. Cleaning / sweeping
- 5 Site inspection**
 - a. Adherence to safety requirements
- 6 Marking of obstacles**
 - a. Hoarding / demarcation of site
 - b. Markings
 - c. Lighting
- 7 Safety training**
 - a. Airside Inductions
 - b. AVOP
 - c. OHS
 - d. Environment
- 8 Security Permits**
 - a. Personnel
 - b. Vehicles / equipment inspections
- 9 PPE**
 - a. Reflective jackets / vests

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- b. Ear protections

10 Hot work permit - Fire & Rescue

11 Contractor staff briefings (proof may be requested)

- a. Precise area in which work may be done
- b. Routes to be followed to and from working area
- c. R/T procedures to be used
- d. Escorting procedures and briefs
- e. Safety precautions to be observed, e.g.:
 - Maintenance of listening watch
 - Use of look-outs
- f. Reporting procedure to be followed on completion of work

12 Written warning to contractor of possible hazards to personnel

(Attach copy)

e.g.: - Jet blast; Noise

13 List of mechanical equipment

(Brief descriptions of equipment may be requested to enhance understanding.)

14 Schedule of Contractors

15 General comments

Compiled by:

Signature:

Date:

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APPENDIX A

SITE INSPECTION PROTOCOL FOR CONSTRUCTION ACTIVITIES

The Airports Company South Africa (ACSA): Environmental Officer should audit one or more method statement per site (if applicable), as well as the general requirements of the Construction ES (see checklist overleaf) during a site inspection.

Project reference:..... Contractor:..... Responsible Person:.....

Method statement(s) audited:

Tick one box:

☐ method statement properly implemented

☐ method statement not properly implemented

If method statement not properly implemented, describe deviations/omissions/problems:

1.
.....
2.
.....
3.
.....

Describe actions/plans to ensure proper implementation of the method statement:

1.
.....
2.
.....
3.
.....

Other observations about implementation (if any):

1.
.....

Signed..... (Airports Company South Africa (ACSA) ECO)

Signed..... (Responsible Person)

Date:

Date:

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SITE INSPECTION PROTOCOL FOR CONSTRUCTION ACTIVITIES

ISSUE	REQUIREMENT FOR COMPLIANCE		COMMENTS/ACTIONS
Site	Site boundary is clearly demarcated and activities undertaken within boundary.		
Toilets	Adequate toilets have been provided. These are secure and well maintained.		
Wastewater	Waste water is discharged to the reticulated system or to a conservancy tank which is emptied as required.		
Refuse	Site is generally tidy and free from litter.		
	No burning or burying waste.		
Natural features	No defacement of natural features to be protected in the site or the immediate surrounding area.		
Runoff	No polluted runoff from the site.		
	No pollution or erosion resulting from runoff of construction water.		
Fuels & chemicals	Servicing & fuelling occurs in designated place. No significant ground contamination.		
	Drip trays in place for pumps and other machinery in fixed location for at least 2 days.		
	Fuel stores on sealed base and adequately bunded.		
	Hazardous materials stored in an enclosed area or as agreed in method statement and appropriately labelled.		
	Spill clean-up materials available on site.		
	No significant spillage.		
Dust	No excessive dust which could cause a nuisance to employees or the public.		
Fire	No fires on site. Use of closed stoves or fires limited to construction camps.		
	Fire extinguishers available near any welding or metal cutting.		
Topsoil	Topsoil removed and stockpiled < 2m high.		
Stabilisation	Slopes stabilised as necessary to prevent erosion.		
Monitoring	Responsible Person's record of major incidents is up to date.		
Training	All Contractors' personnel are aware of environmental responsibilities.		
	Records of training maintained by Responsible Person.		

C3.7.3: REQUIREMENTS OF GOVERNMENT'S PROGRAMME FOR BROAD-BASED BLACK EMPOWERMENT

C3.7.3.1 SCOPE

1. GOVERNMENT POLICY

There is a compelling need to elevate development of previously disadvantaged individuals and enterprises, and leadership by Airports Company South Africa (ACSA) is required to establish the framework for the development of previously disadvantaged individuals and enterprises. (based on CIDB NCDP 2011).

The objective of the NCDP is to promote equity ownership across the different contracting categories and grades, as well as improving skills and performance in the delivery and maintenance of capital works across the public sector.

2. APPLICABLE LEGISLATION

All tenders will be considered with specific reference to applicable legislation in force from time to time and which are specifically applicable to organs of state for example the following:-

- 2.1 Public Finance Management Act No. 1 of 1999;
- 2.2 Preferential Procurement Policy Framework Act No. 5 of 2000;
- 2.3 The Constitution of South Africa
- 2.4 Broad-Based Black Economic Empowerment Act No. 53 of 2003
- 2.5 National Small Business Amendment Act No. 26 of 2003

3. PREFERENCE POINTS CLAIM FORM IN TERMS OF THE PREFERENTIAL PROCUREMENT REGULATIONS 2017

1.

This preference form must form part of all bids invited. It contains general information and serves as a claim form for preference points for Broad-Based Black Economic Empowerment (B-BBEE) Status Level of Contribution

NB: BEFORE COMPLETING THIS FORM, BIDDERS MUST STUDY THE GENERAL CONDITIONS, DEFINITIONS AND DIRECTIVES APPLICABLE IN RESPECT OF B-BBEE, AS PRESCRIBED IN THE PREFERENTIAL PROCUREMENT REGULATIONS, 2017.

2. GENERAL CONDITIONS

- 2.1 The following preference point systems are applicable to all bids:
- the 80/20 system for requirements with a Rand value of up to R50 000 000 (all applicable taxes included); and
 - the 90/10 system for requirements with a Rand value above R50 000 000 (all applicable taxes included).
- 2.2
- a) The value of this bid is estimated to ~~exceed/not exceed~~ R50 000 000 (all applicable taxes included) and therefore the 80/20 preference point system shall be applicable; or
 - b) Either the 80/20 or 90/10 preference point system will be applicable to this tender (~~delete whichever is not applicable for this tender~~).

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2.3 Points for this bid shall be awarded for:

- (a) Price; and
- (b) B-BBEE Status Level of Contributor.

2.4 The maximum points for this bid are allocated as follows:

	POINTS
PRICE	80
B-BBEE STATUS LEVEL OF CONTRIBUTOR	20
Total points for Price and B-BBEE must not exceed	100

2.5 Failure on the part of a bidder to submit proof of B-BBEE Status level of contributor together with the bid, will be interpreted to mean that preference points for B-BBEE status level of contribution are not claimed.

2.6 The purchaser reserves the right to require of a bidder, either before a bid is adjudicated or at any time subsequently, to substantiate any claim in regard to preferences, in any manner required by the purchaser.

3

PREFERENCE POINTS CLAIM FORM IN TERMS OF THE PREFERENTIAL PROCUREMENT REGULATIONS 2017

This preference form must form part of all bids invited. It contains general information and serves as a claim form for preference points for Broad-Based Black Economic Empowerment (B-BBEE) Status Level of Contribution

NB: BEFORE COMPLETING THIS FORM, BIDDERS MUST STUDY THE GENERAL CONDITIONS, DEFINITIONS AND DIRECTIVES APPLICABLE IN RESPECT OF B-BBEE, AS PRESCRIBED IN THE PREFERENTIAL PROCUREMENT REGULATIONS, 2017.

1. GENERAL CONDITIONS

1.1 The following preference point systems are applicable to all bids:

- the 80/20 system for requirements with a Rand value of up to R50 000 000 (all applicable taxes included); and
- the 90/10 system for requirements with a Rand value above R50 000 000 (all applicable taxes included).

1.2

- a) The value of this bid is estimated to **exceed/not exceed** R50 000 000 (all applicable taxes included) and therefore the **80/20** preference point system shall be applicable; or
- b) Either the 80/20 or 90/10 preference point system will be applicable to this tender (*delete whichever is not applicable for this tender*).

1.3 Points for this bid shall be awarded for:

- (a) Price; and
- (b) B-BBEE Status Level of Contributor.

1.4 The maximum points for this bid are allocated as follows:

	POINTS
PRICE	80
B-BBEE STATUS LEVEL OF CONTRIBUTOR	20
Total points for Price and B-BBEE must not exceed	100

1.5 Failure on the part of a bidder to submit proof of B-BBEE Status level of contributor together with the bid, will be interpreted to mean that preference points for B-BBEE status level of contribution are not claimed.

1.6 The purchaser reserves the right to require of a bidder, either before a bid is adjudicated or at any time subsequently, to substantiate any claim in regard to preferences, in any manner required by the purchaser.

C3.7.3.2 DEFINITIONS

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- 1) **BBBEE**
Broad-Based Black Economic Empowerment
- 2) **BO**
Black Owned
- 3) **BWOYO**
Black Woman Owned, Youth Owned
- 4) **CIDB**
Construction Industry Development Board
- 5) **CPG**
Contract Participation Goals
- 6) **EME**
Exempted Micro Enterprise
- 7) **ISO**
Quality management systems standards
- 8) **JV**
Joint Venture
- 9) **NCDP**
National Contractors Development Programme
- 10) **PPPFA**
Preferential Procurement Policy Framework Act
- 11) **PWPDO**
Persons with Physical Disability Owned
- 12) **SADC**
Southern African Development Community
- 13) **TSS PPM**
Technical Services Solutions - Project Portfolio Management

Compulsory Subcontract

Bidders must subcontract minimum of 15% of the value and content of the contract to EME's or QSE's which are at least 51% Black African owned as well as signed Contractor Participation Goal targets. Returnable document number C2 and C15

1. 51% black owned;
2. 51% owned by black youth;
3. 51% owned by black women;
4. 51% owned by black people with disabilities;
5. 51% owned by black people in rural areas, underdeveloped areas or townships;
6. a co-operative that is 51% owned by black people;
7. 51% owned by black people who are military veterans; or
8. More than one of the above-mentioned categories.

TABLE A

Size	Total Gross asset value (fixed property excluded) (less than)	Total annual turnover (less than)	Total full time equivalent of paid employees (less than)
Medium	R 5 m	R 26 m	200
Small	R 1 m	R 6 m	50
Very Small	R 0.5 m	R 3 m	20
Micro	R 0.1 m	R 0.2 m	5

C3.7.3.3 CONTRACT PARTICIPATION

Airports Company South Africa aims to contract predominantly with Empowering Suppliers per the definition in P010 004P (Airports Company South Africa (ACSA) internal transformation policy) were this relates to:

- an increase in local production,
- raw material beneficiation
- retention and employment of black people
- the transfer of skills to black owned EME's and QSE's.

1. Contract Participation Goals (CPG)

CPG refers to the extent to which the contracted resources achieve predetermined transformation objectives, expressed as a percentage (%) of the contract value. Bidders are expected to achieve this target by the end of the project.

- Bidders are to submit to submit a transformation proposal meeting the CPG target for all contracts over R1m including VAT.

3. CPG for this contract will be at 15% which will consist of the following B-BBEE elements:

- Equity (Target 50%): 40% weighting.
- Management (Target 50%): 40% weighting
- Skills development: optional no target 5% weighting
- Enterprise and supplier development: optional no target 10% weighting
- Socio economic development: optional no target 5% weighting

4. To facilitate achievement of targets set out in 3, and transfer of skills, the tenderer **must** subcontract more than 15% of the contract value to CIDB Grade 2 to 6 CE contractors that are women owned, youth owned, PWPDO, or allocate to EME, QSE that are 51% black owned entities.

5. In the event that the Contractor/consultant fails to substantiate that any failure to achieve the contract participation goal relating to the granting of a preference was due to quantitative underruns, the elimination of items, or any other reason beyond the Contractor's control which may be acceptable to the Employer, the Contractor/Consultant shall be liable to pay to the Employer a financial penalty calculated in the following manner:

$$P = (0,15 \times (D - Do) \times CA)/100$$

- where D is the tendered contract participation goal percentage;
- Do is the contract participation goal which the Employer's representative, certifies based on the credits passed, as being achieved upon completion of the contract;
- CA is the contract amount.
- P is the monetary value of penalty payable

No financial award is due for over performance on CPG.

Weighting		CPG		Contract CPG	
45%		24%			
45%		31%			
10%		4%		59%	

6. Sample score sheet for Calculation of Contract Participation goals

[illegible]

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PART C4: SITE INFORMATION

CONTRACT NO: ELA7760/2025/RFP
CONTRACTOR APPOINTMENT FOR DESIGN AND CONSTRUCTION OF PAVED ACCESS ROADS TO RUNWAYS, TURN PAD FOR RUNWAY 24, CONCRETE APRON REFURBISHMENT AND EXTENSION OF TAXILANE FOR A PERIOD OF 26 MONTHS AT KING PHALO AIRPORT

C4: SITE INFORMATION
C4.1 SCOPE AND DISCLAIMERS
C4.2 SITE DESCRIPTION
C4.3 CLIMATE DATA
C4.4 CONSTRUCTION CONSTRAINTS AND ENVIRONMENTAL CONDITIONS C4.6 TRAFFIC
APPENDIXC4A - SUMMARY OF PAVEMENT INVESTIGATION AND MATERIAL TEST RESULTS

C4 SITE INFORMATION

C4.1. SCOPE AND DISCLAIMERS

The information contained in Part C4 is intended as an indication of the conditions likely to be encountered. All drawings, opinions, interpretations and suggested working methods given in this volume must be regarded as a guide. The results are given in good faith but no warranty is given that the information is representative of the entire airport or route, and no responsibility will be accepted for any consequence arising from actual conditions being different from those indicated in this volume.

C4.2. SITE DESCRIPTION

C4.2.1 General

Project location and areas to be constructed at East London Airport:



C4.2.2 Pavement Layer Works

Site test pits excavated by Messrs Controlab in November 2018 and the preliminary laboratory test results are included in Appendix C4 A. Test pit positions are summarised below.

According to the materials investigation report, the site under investigation falls within the Katberg Formation (part of the East London Katberg Wedge) of the Tarkastad Subgroup belonging to the greater Karoo Supergroup. The Tarkastad Subgroup is characterized by a greater abundance of both sandstone and red mudstone.

The test pit results indicate that the site is mainly located on imported fill material (Test Pits 2, 5, 6, 7), with residual horizons being located at a depth of roughly 500mm at test pits 1, 3 and 4. Laboratory tests describe residual material as either weathered sandstone or shale and it is consistent with the geology of the area. Fill materials are either described medium dense as imported grey dolerite or dark brown soft silty clay. Due to the variability of the materials and their description (i.e. clayey sand, clay), they cannot be used for selected layer construction purposes and it is recommended that all pavement

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layer materials be imported from commercial sources. This recommendation must be reviewed once the grading and CBR testing results become available.

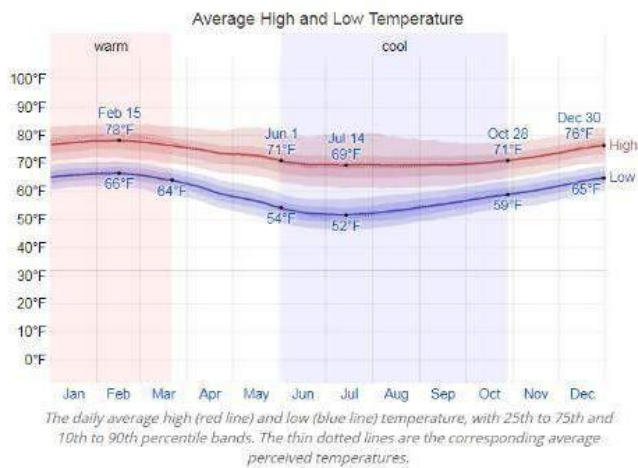


C4.3 CLIMATE DATA

C4.3.1 CLIMATE

Data with regard to precipitation and temperature was obtained from <https://weatherspark.com/y/148575/Average-Weather-at-East-London-Airport-South-Africa-Year-Round> and is summarised in Figure 4.3.1 below.

FIGURE 4.3.1: Average Daily Temperatures



C4.4 CONSTRUCTION CONSTRAINTS AND ENVIRONMENTAL CONDITIONS

The following climatic aspects are of significance to the construction and performance of the asphalt work and others:

- During the summer, rainfall occurs mostly in the form of high intensity thunderstorms.
- Asphalt temperatures cool very rapidly when being placed during days when the temperature drops to below 5°C (Figure 4.3.1) and, it might be difficult to achieve effective compaction of thin asphalt and surfacing layers. Bitumen are also sensitive for these conditions with possible stripping of stone particularly for night work during the winter months.

It is undesirable to construct the asphalt in very cold weather, which highlights the importance of planning in months June, July and August as mentioned, asphalt premix work will be severely constrained with the minimum temperature falling below 5 °C.

- Very low temperatures increase the stiffness of asphalt mixes and also the brittleness of the mixes. This can lead to early fatigue and shrinkage cracking if design principles are ignored.
- Consistently high air temperatures (> 25°C,) during the summer can result in the softening of the asphalt leading to rutting (deformation) in the upper asphalt under slow moving (creep load) with high tyre pressures. Special attention needs to be given to asphalt and bitumen properties, considering the choice of binder and mix stability.

C4.5 RESTRICTED ACCESS TO THE SITE OF THE WORKS

C4.5.1 Restricted Areas

The contractor will have restricted access to the works, because simultaneous closure of the entire runways, taxiways, taxilanes and apron during normal operational hours will not be permitted, unless otherwise indicated.

Although the entire site will be handed to the Contractor at the start of the contract, the airport manager and maintenance department have the right to decide at short notice where on the site the Contractor may work. The main runway will remain operational, work within 50 m of the runway will be limited to night work and subjected to approval by the AM. Upon requested and subsequent approval from the Airport Management, the secondary runway (Runway 06/24) will be closed for the contractor to work during operational hours of the airport. However, in the case of an emergency the contractor must evacuate the runway at short notice.

The condition to work within the 50 m distance from the runway edge are:

- Permission from the Airport Management to do so
- No vehicle or equipment to be left unattended for quick removal in case of emergencies
- No stock piling of any material
- Excavation to be covered with fill and compacted to 90% Modified AASHTO density to meet adjacent levels before handing back to operations.

With regards to work at the runway ends in line with approaching/departing aircraft on Runway 11/29, the runway ends up to the runway instrument landing systems (ILS) for an approximate distance of 300 m are also regarded as restricted areas and subject to night work. The above-mention condition is also applicable for the first 50 m from the runway ends.

All work within 50 m of the main or secondary runway will be limited to night work and approval by the AM.

C4.5.2 Access Point and Routes

The designated access point for plant and personnel will be at the main landside/airside gate. Airports Company South Africa (ACSA) is providing 24 hour security at this gate. The Contractor to complete the Airside Vehicle Operating Permit (AVOP) training to escort all deliveries on site. Only boundary roads to be used by the Contractor. All employees of the contractor to complete the Airside Induction Training course.

Construction material must be delivered via the main access gate to the site camp under escort service. The Contractor shall erect, maintain, move and finally remove temporary barriers, fences, signs and markings, all as prescribed by the airport authorities. The Contractor shall ensure that all barricades, markers and signs are placed under escort, prior to entering a work area for construction purposes. Movement outside the areas demarcated for construction shall not be permitted, unless special arrangements have been made and approved by the AM.

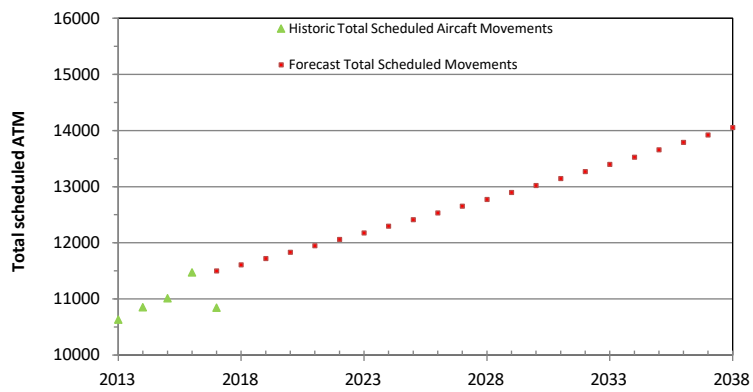
C4.6 TRAFFIC

Airports Company South Africa (ACSA) compiled a safety case file in 2011 due to visibility constraints at Runway 06. The report was used to establish the percentage of scheduled traffic arriving on Runway 06 and those departing from Runway 24. The results are shown below, it is assumed that the proportions did not change over time.

Year	RWY06 Scheduled Arrival	RWY24 Scheduled Departure	RWY06 + RWY24 Combined	Total scheduled movement potential on turn pad	Percentage of total scheduled movements	Average
2005	649	356	1 005	12 928	7.8%	7.3%
2006	707	357	1 064	15 409	6.9%	
2007	2 584	506	3 090	14 520	21.3%	24.4%
2008	3 011	562	3 573	14 624	24.4%	
2009	2 890	451	3 341	14 191	23.5%	
2010	3 008	327	3 335	13 628	24.5%	
2011*	978	31	1 009	3 581	28.2%	

A regression analysis was done on data from 2013 to 2017 to estimate the historic growth rate of 1 % growth per annum. The large aircraft total movement history and estimate for this study is represented below.

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This procedure invariably assumes that future growth is equivalent to historical growth but it must be remembered that future growth is also more dependent on the ability of the airport to attract scheduled operators. This can unfortunately not be forecasted accurately. The traffic forecast presented above translates to 12 885 scheduled aircraft per annum for a period of 20 years.

APPENDIX C4.A

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SUMMARY OF PAVEMENT INVESTIGATION AND MATERIAL TEST RESULTS



Controlab South Africa (Pty) Ltd

CIVIL ENGINEERING MATERIAL AND GEOTECHNICAL LABORATORY,
GEOTECHNICAL AND ENVIRONMENTAL SERVICES

www.controlab.co.za

HEAD OFFICE: 1 Alfred Road, Vincent 5247, Tel: 043 726 7859, Fax: 043 726 7426

CENTRAL LABORATORY : 10 St Pauls Road, East London, 5201, Tel: 043 722 5420 / 722 8565, Fax: 043 743 9942, P O Box 346, East London, 5200

OTHER BRANCH OFFICES: Cape Town, Kokstad, Johannesburg, Mthatha, Queenstown, Lusaka - Zambia



ISO/IEC 17025:2005 Accredited Laboratory
10308

Reference: 12122018Rep - East London Airport (Delta)

12 December 2018

Delta Built Environment Consultants P O Box
35703
Menlo Park PRETORIA
0102

ATTENTION: MR P AGEMA

Dear Sir

CONSTRUCTION OF RUNWAY ACCESS ROADS AND TURNING EAR AT EAST LONDON AIRPORT - EAST LONDON AIRPORT: GEOTECHNICAL REPORT

Controlab was requested to do a geotechnical/material investigation on the above-mentioned project. The project was situated at the East London Airport where improvements on the runways were planned. The investigation consisted of seven (7) trial pits excavated by hand to depth in excess of 0,8m. Dynamic Cone Penetrometer (DCP) test was performed adjacent to the trial pits.

The trial pits were profiled by a qualified Engineering Technician utilising "The Revised Guide to Soil Profiling for Civil Engineering Purposes in Southern Africa" produced by Jennings, Brink and Williams. The trial pit profiles are attached to this document. The purpose of the investigation was to establish the geotechnical conditions and existing pavement structure on site for the proposed upgrading of the runway pavements.

The site was situated in the western part of the city of East London within the Buffalo City Metropolitan Municipality, Eastern Cape Province.

East London normally receives about 593mm of rain per year, with most rainfall occurring during summer. It receives the lowest rainfall (16mm) in July and the highest (79mm) in March. The average midday temperatures for East London range from 20°C in July to 26°C in February. The region is the coldest during July when the temperature drops to 9.3°C on average during the night.

Wienerts climatic N number for the area is less than 2, which should indicate that the rocks would decompose implying that chemical weathering would dominate over mechanical weathering.

CHIEF EXECUTIVE OFFICER: ML PROUDFOOT B.Tech.Eng. (ECSA) R.Eng (EngRB of Zambia) MSc (Geotech.Eng.)

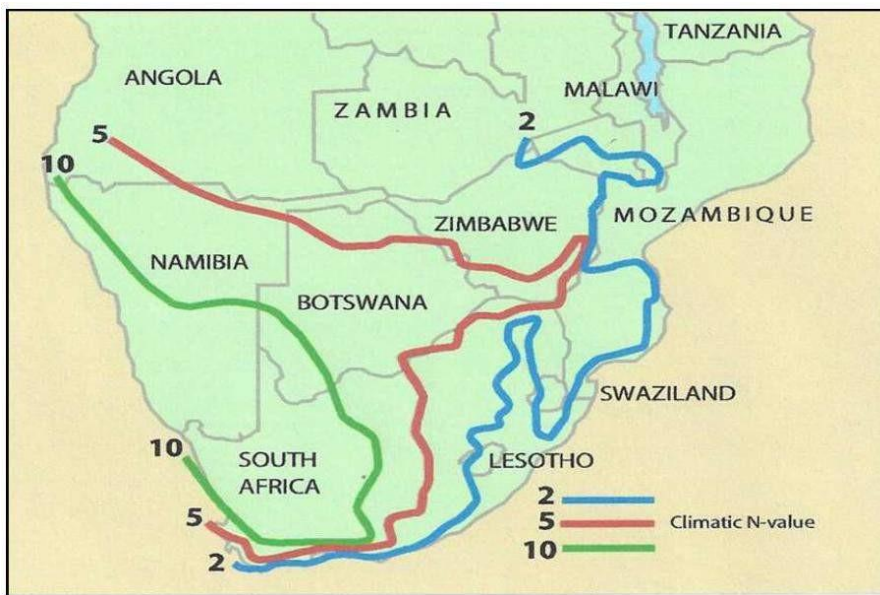
DIRECTORS: D LOUW B.Tech.Eng. MSc (Civils) (MANAGING), L PROUDFOOT B.Sc.Nat MSc (OPERATIONS)



Confidential



Locality Map



Weinerts Climatic "N-Value"

According to the 1:250 000 geological map (3228, Kei Mouth) published in 1979 by the Chief Director of Surveys and Mapping, the site under investigation falls within the Katberg Formation (Part of the East London Katberg Wedge) of the Tarkastad Subgroup belonging to the greater Karoo Supergroup.

The Katberg Formation forms part of the Tarkastad Subgroup of the Beaufort Group belonging to the greater Karoo Basin. The Tarkastad Subgroup is characterized by a greater abundance of both

sandstone and red mudstone than the Adelaide Subgroup. The boundary between these subgroups is the only line that can be traced with certainty throughout the Karoo Basin.

The Katberg Formation is known to be sandstone rich and constitutes over 90% of the Formations makeup in cases where the Katberg Formation is found in coastal localities near East London. However, inland exposures have a more equal division of sandstone and mudstone. In the North, the mudstone becomes excessive and difficulty in distinguishing it from the Burgersdorp Formation may occur. The Katberg is just over 900m thick in most cases.

Sandstones of the Katberg Formation are fine to medium grained with scattered pebbles up to 150mm in diameter, (common in coastal exposures). Generally, the rocks are light brown to grey or greenish grey in colour with strong horizontal laminations, parting lineations, trough cross bedding and planar cross bedding characteristics.

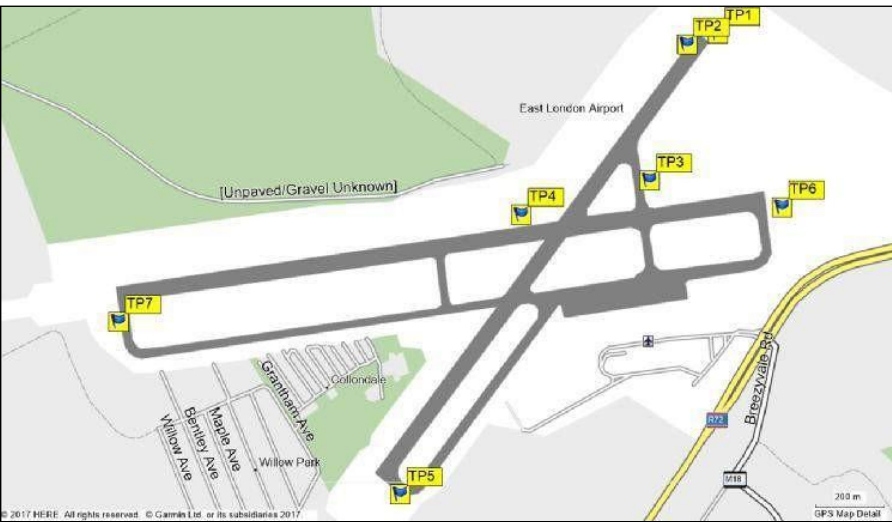
Oval shaped calcareous concretions between 30 and 100mm in diameter are common with a preferred orientation in a parallel direction to the palaeoslope present at deposition.

Post depositional dolerite intrusions are present as well. The dolerite intrusions may occur as either, horizontal sills and lenses or vertical dykes which cut through the sedimentary layers. Furthermore, the vertical dykes cut through the horizontal sills.



Seven (7) trial holes were excavated and the co-ordinates were as follows:

➤ TP1	S 33°01'49.7"	E 27°49'51.5"
➤ TP2	S 33°01'50.7"	E 27°49'48.0"
➤ TP3	S 33°02'03.4"	E 27°49'43.7"
➤ TP4	S 33°02'06.6"	E 27°49'29.1"
➤ TP5	S 33°02'32.7"	E 27°49'15.3"
➤ TP6	S 33°02'05.9"	E 27°49'58.8"
➤ TP7	S 33°02'16.6"	E 27°48'43.2"



Trial Pit Positions



Disturbed soil samples were taken of typical horizons for Road Indicator, California Bearing Ratio and Atterberg Limits tests.

One (1) sample was selected to perform a stabilization design on.

BRIEF INTERPRETATION OF THE TEST RESULTS

- **Typical Horizons**

The purpose of the investigation was to determine the exiting pavement structure and material within the top 800mm of the areas of the runway to be improved. The thickness of the profiled material at the various trial pits can be summarised as follows:

TP NO	DEPTH		DESCRIPTION	ORIGEN	TRH14
TP1	0	300	Sandy Silt + Roots	Imported	G9
	300	500	Silty Clay	Transported	G9
	500	800	Weath sandstone	Residual	<G10
TP2	0	200	Sandy Silt + Roots	Imported	
	200	400	Dec Dol	Imported	G7
	400	600	Dec Dol	Imported	G8
	600	790	Sandy Silt	Transported	G9
TP3	0	540	Sandy Silt + Roots + shale	Imported	G10
	540	760	Weath sandstone	Residual	G8
TP4	0	160	Premix	Imported	
	160	350	Quartzite Cr	Imported	G6
	350	460	Silty Clay	Imported	G10
	460	640	Shale	Residual	G10
TP5	0	240	Sandy Silt + Roots	Imported	G8
	240	800	Dec Dol	Imported	G7/G6
TP6	0	320	Sandy Silt + shale + sandstone + Roots	Imported	G6
	320	600	Sandy Silt + shale + sandstone + Roots	Imported	G9
	600	810	Weath sandstone	Imported	G10
TP7	0	260	Sandy Silt + shale + Roots	Imported	G9
	260	800	Sandy Silt + shale + Dec Dol	Imported	G9

- **Nuclear Gauge Tests**

Nuclear gauge density tests were performed on each exposed material horizon. The results indicated high field moisture content values. These values are indications of high water tables or poor storm water management.

SAMPLE No.	CHAINAGE & POSITION	LAYER THICKNESS mm	DEPTH OF PROBE mm	MATERIAL DESCRIPTION	LAB DATA		FIELD DATA		
					O.M.C %	M.D.D. kg/m ³	DRY DENSITY kg/m ³	COMP. %	M.C. %
6442	TP 1	0 - 300	0-150	dk Br sdy st	9.7	1960	1626	83.0	6.1
6443	TP 1	300 - 500	0-150	dk Br sdy st +Ferr	11.3	2232	1766	79.1	10.6
6444	TP 1	500 - 800	0-150	lt Y O weathSs + cly st	13.1	1917	1487	77.6	30.5
6445	TP 2	200 - 400	0-150	dk Y O Dol +dec Dol	10.7	2086	1952	93.6	7.2
6446	TP 2	400 - 600	0-150	lt Y O dec Dol	8.6	2088	1829	87.6	10.9
6447	TP 2	600 - 790	0-150	dk Brsdy st	9.7	2018	1929	95.6	9.6
6448	TP 3	0 - 540	0-150	lt Br sdy st + Sh	9.7	2018	1700	84.2	8.1
6449	TP 3	540 - 760	0-150	lt R Br weath Sh	10.9	1989	1745	87.7	15.4
6450	TP 2	0 - 200	0-150	dk Br sdy st	7.1	2324	2047	88.1	7.2
6451	TP 4	160 - 350	0-150	dk Br Qtzte Crusherrun	7.3	2130	1901	89.2	9.4
6452	TP 4	350 - 460	0-150	dk Br sdy st	9.3	2020	1949	96.5	9.4
6453	TP 4	460 - 640	0-150	dk Ol Sh +sdy st	10.2	1992	1450	72.8	17.0
6454	TP 5	0 - 240	0-150	dk Br sdy st	9.0	2038	1805	88.6	12.3
6455	TP 5	240 - 800	0-150	lt R O dec Dol +Dol	10.9	2122	1841	86.8	11.8
6571	TP 6	0 - 320	0-150	lt Br dec Dol +Dol	6.7	2172	1801	82.9	14.8
6572	TP 6	320 - 600	0-150	dk R Br Sh +sdy st	9.7	2026	1792	88.5	12.8
6573	TP 6	600 - 810	0-150	lt Y O weath Ss + sdy st	10.5	2016	1581	78.4	21.9
6574	TP 7	0 - 260	0-150	dk Br sdy st	10.4	1974	1707	86.5	7.6
6575	TP 7	260 - 800	0-150	lt Br Sh +sdy st	8.4	2216	1755	79.2	15.1

The compaction measured within the layers tested was generally lower that what would be expected of constructed pavement layers.

- **Road Indicator Tests**

Twenty (20) disturbed samples were tested to determine quality of the material profiled. The imported decomposed dolerite varied between G8 and G6 quality with the silts and sandy material varying between a G10 and G9 quality.

One (1) stabilization design was performed on the decomposed dolerite profiled and samples at TP5 (240mm to 800mm). The stabilization agent used was AFRSAM ROADSTAB 32,5N. The results indicated that the material would meet the requirement for a C4 classification with 3% cement.

% CEMENT	1.50	3.00	4.50
U.C.S. (mPa)	0.71	1.42	2.95
DRY DENSITY	2075	2064	2047
% COMPACTION	99.8	99.3	98.5
I.T.S. (kPa)	91	136	293
DRY DENSITY	2082	2077	2055
% COMPACTION	100.1	99.9	98.8
MOD AASHTO	2079	2079	2079
O.M.C. (%)	11.7	11.7	11.7

POSITION	DEPTH	DESCRIPTION	GM	L L (%)	P I (%)	L S (%)	MDD (kg/m3)	OMC (%)	C.B.R. @ 100%	C.B.R. @ 95 %	C.B.R. @ 90 %	SWELL (%)	TRH14 CLASS
TP 1	0 - 300	dk Br sdy st	0.66	CBD	SP	1.0	1960	9.7	19	11	7	0.40	G9
	300 - 500	dk Br sdy st + Ferr	1.32	24	8	4.0	2232	11	32	12	5	0.20	G9
	500 - 800	lt Y O weath Ss + cly st	1.10	34	13	6.0	1917	13	3	2	1	0.60	<G10
TP 2	200 - 400	dk Y Dol + dec Dol	2.07	22	6	2.5	2324	7.1	58	24	10	0.40	G7
	400 - 600	lt Y O dec Dol	1.35	31	10	4.5	2086	11	30	13	8	0.20	G8
	600 - 790	dk R Br sdy st	0.83	CBD	SP	1.0	2088	8.6	15	10	7	0.30	G9
TP 3	0 - 540	lt Br sdy st	0.79	CBD	NP	0.0	2018	9.7	27	11	4	0.40	G10
	540 - 760	lt R Br weath Ss + sdy st	1.02	19	4	2.0	1989	11	35	20	11	0.30	G8
	160 - 350	dk Br Qtztc C/run	2.61	CBD	NP	0.0	2130	7.3	58	27	13	0.10	G6
TP 4	350 - 460	dk Br sdy st	1.09	CBD	NP	0.0	2020	9.3	14	7	4	0.30	G10
	460 - 640	dk Ol Sh + sdy st	1.25	CBD	SP	1.0	1992	10.2	14	5	2	0.40	G10
	0 - 240	dk Br sdy st	1.14	CBD	NP	0.0	2038	9.0	27	13	6	0.40	G8
TP 5	240 - 800	lt R O dec Dol + Dol	1.63	31	7	3.0	2122	11	80	33	15	0.30	G7 / G6
	0 - 320	lt Br dec Dol + Dol	1.76	CBD	SP	1.5	2172	6.7	54	24	12	0.50	G6
	320 - 600	dk R Br Sh + sdy st	0.68	CBD	NP	0.0	2026	9.7	12	10	6	0.30	G9
TP 6	600 - 800	lt Y O weath Sh + Ferr + sdy st	1.04	CBD	NP	0.0	2016	11	12	6	4	0.30	G10
	0 - 260	dk Br sdy st	0.81	21	4	2.0	1974	10	19	11	6	0.40	G9
	260 - 800	lt Br Sh + sdy st	1.50	24	6	3.0	2216	8.4	23	11	5	0.50	G9

Depending on the proposed pavement design, selected material may be suitable for re-use.

• DCP Results/Bearing Capacity

DCP tests were performed adjacent to the trial pits excavation. The DCP tests did not record any penetration refusals at TP3 and TP4 within imported sandstone or shale.

POSITION	CO-ORDINATE	DCP DEPTH	MIN DCP CBR
TP 1	S 33°01'49.7" E 27°49'51.5"	No Refusal	8
TP 2	S 33°01'50.7" E 27°49'48.0"	No Refusal	20
TP 3	S 33°02'03.4" E 27°49'43.7"	Refusal @ 465mm	13
TP 4	S 33°02'06.6" E 27°49'29.1"	Refusal @ 480mm	12
TP 5	S 33°02'32.7" E 27°49'15.3"	No Refusal	33
TP 6	S 33°02'05.9" E 27°49'58.8"	No Refusal	11
TP 7	S 33°02'16.6" E 27°49'43.2"	No Refusal	7
DCP A	S 33°01'42.3" E 27°49'58.2"	No Refusal	9
DCP B	S 33°01'51.8" E 27°49'54.9"	No Refusal	19
DCP C	S 33°02'03.3" E 27°49'45.1"	No Refusal	22
DCP D	S 33°02'03.5" E 27°49'29.5"	No Refusal	12
DCP E	S 33°02'08.2" E 27°48'56.2"	No Refusal	21
DCP F	S 33°02'16.3" E 27°48'36.6"	No Refusal	9
DCP G	S 33°02'04.7" E 27°50'10.0"	No Refusal	12
DCP H	S 33°02'36.4" E 27°49'12.2"	No Refusal	10

The laboratory tests confirmed the low DCP-CBR values as determined in the laboratory.

Note that the DCP penetration rate will change with any changes to the moisture content or density of the material tested.

- **Ground Water**

No indications of water seepage were noted during the field investigation. Based on the high field moisture content values it would however be recommended that the design allows for proper storm water management.

- **Excavations**

Excavations were done by hand and can generally be classified as being soft.

Based on the results from the investigation, it can be noted that most of the material profiled within the top 800mm of the trial pits consisted of imported decomposed dolerite (generally G7/G6) or weathered shale with silt (G10 to G8 quality). There was evidence of high field moisture content, but this could be due to poor storm water management and not necessarily high water tables. The nuclear gauge density tests indicated that most of the horizons tested had poor compaction (less than 90% of modified AASHTO density).

Note that this report does not give a pavement design but offers an interpretation of the laboratory test results.

Regards,



DEON LOUW
MANAGING DIRECTOR

Pr. Tech. Eng, MSc (Civil)



ControlLab South Africa (Pty) Ltd

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GEOTECHNICAL AND ENVIRONMENTAL SERVICES

www.controlab.co.za

HEAD OFFICE: 1 Alfred Road, Vincent 5247, Tel: 043 726 7859, Fax: 043 726 7428

CENTRAL LABORATORY: 10 St Pauls Road, East London, 5201, Tel: 043 722 5420 / 722 6565, Fax: 043 743 9942, P O Box 346, East London, 5200

OTHER BRANCH OFFICES: Cape Town, Kokstad, Johannesburg, Mthatha, Queenstown, Lusaka - Zambia



ISO/IEC 17025:2005 Accredited Laboratory

CLIENT: Delta Built Environment Consultants
P O Box 35703
Menlo Park
PRETORIA
0102

PROJECT: CONSTRUCTION OF RUNWAY
ACCESS ROADS & TURNING EAR
AT E.L. AIRPORT

DATE RECEIVED: 2018-11-05

DATE TESTED: 2018-11-26

DATE REPORTED: 2018-12-11

TEST REPORT NO.: 92639

ATT: Mr P Agema

MATERIALS TEST REPORT

SAMPLE NO:	6442	6443	6444		
POSITION / CHAINAGE		TP 1			
DEPTH mm	0 - 300	300 - 500	500 - 800		
DESCRIPTION	dk Br	dk Br	lt Y O		
	sdv st	sdv st +	weath Ss +		
		Ferr	clt st		

Sieve Analysis (Wet Preparation) SANS 3001 - Part A01

% PASSING 75 mm					
63 mm					
50 mm					
37.5 mm					
28 mm					
20 mm					
14 mm		100	100		
5 mm	100	96	99		
2.00 mm	98	77	92		
0.425 mm	91	59	65		
0.075 mm	45.3	32.5	32.9		

Soil Mortar Analysis - SANS 3001 - PR5

COURSE SAND (%)	7	23	29		
FINE SAND (%)	47	34	35		
SILT / CLAY (%)	46	42	36		
GRADING MODULUS	0.66	1.32	1.10		

Atterberg Limits - SANS 3001 - GR10 & GR11

LIQUID LIMIT (%)	CBD	24	34		
PLASTICITY INDEX (%)	SP	8	13		
LINEAR SHRINKAGE (%)	1.0	4.0	6.0		

Maximum Dry Density & Optimum Moisture Content - SANS 3001 - GR30 / California Bearing Ratio - SANS 3001 - GR40

Maximum Dry Density (kg/m ³)	1960	2232	1917		
Optimum Moisture Content (%)	9.7	11.3	13.1		
C.B.R. @ 100% COMPACTION	19	32	3		
C.B.R. @ 98% COMPACTION	15	23	2		
C.B.R. @ 95% COMPACTION	11	12	2		
C.B.R. @ 93% COMPACTION	9	8	2		
C.B.R. @ 90% COMPACTION	7	5	1		
SWELL @ 100% COMP. (%)	0.40	0.20	0.60		
T R H 14 CLASSIFICATION	G9	G9	<G10		

The above test results are pertinent to the samples tested only. While the tests are carried out according to recognized standards, Controlab shall not be liable for erroneous testing or reporting thereof. This report may not be reproduced except in full without prior consent of Controlab.

Technical Signatory:

J Atterbury

Remarks:

Sample Delivered by Customer

Sampled by Controlab: YES

Page 1 of 4

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HEAD OFFICE: 1 Alfred Road, Vincent 5247, Tel: 043 726 7859, Fax: 043 726 7425

CENTRAL LABORATORY: 10 St Pauls Road, East London, 5201, Tel: 043 722 5420 / 722 8585, Fax: 043 743 9942, P O Box 346, East London, 5200

OTHER BRANCH OFFICES: Cape Town, Kokstad, Johannesburg, Mthatha, Queenstown, Lusaka - Zambia



Testing Laboratory

ISO/IEC 17025:2005 Accredited Laboratory

CLIENT: Delta Built Environment Consultants
P O Box 35703
Menlo Park
PRETORIA
0102

PROJECT: CONSTRUCTION OF RUNWAY
ACCESS ROADS & TURNING EAR
AT E.L. AIRPORT

DATE RECEIVED: 2018-11-05

DATE TESTED: 2018-11-28

DATE REPORTED: 2018-12-11

TEST REPORT NO.: 92639

ATT: Mr P Agema

MATERIALS TEST REPORT

SAMPLE NO:	6445	6446	6447	6448	6449	
POSITION / CHAINAGE	TP 2		TP 3			
DEPTH mm	200 - 400	400 - 600	600 - 790	0 - 540	540 - 780	
DESCRIPTION	dk Y	lt Y O	dk R Br	lt Br	lt R Br	
	Dol +	dec Dol	sdY st	sdY st	weath Ss +	
	dec Dol				sdY st	

Sieve Analysis (Wet Preparation) SANS 3001 - Part AG1

% PASSING 75 mm						
63 mm						
50 mm						
37.5 mm						
28 mm						
20 mm	100	100			100	
14 mm	87	97		100	98	
5 mm	61	93	100	96	90	
2.00 mm	48	82	94	92	84	
0.425 mm	30	55	80	86	79	
0.075 mm	15.5	27.8	42.6	43.3	35.2	

Soil Mortar Analysis - SANS 3001 - PR5

COURSE SAND (%)	38	33	15	7	6	
FINE SAND (%)	30	33	40	46	52	
SILT / CLAY (%)	32	34	45	47	42	
GRADING MODULUS	2.07	1.35	0.83	0.79	1.02	

Atterberg Limits - SANS 3001 - GR10 & GR11

LIQUID LIMIT (%)	22	31	CBD	CBD	19	
PLASTICITY INDEX (%)	6	10	SP	NP	4	
LINEAR SHRINKAGE (%)	2.5	4.5	1.0	0.0	2.0	

Maximum Dry Density & Optimum Moisture Content - SANS 3001 - GR30 / California Bearing Ratio - SANS 3001 - GR40

Maximum Dry Density (kg/m ³)	2324	2086	2088	2018	1989	
Optimum Moisture Content (%)	7.1	10.7	8.6	9.7	10.9	
C.B.R. @ 100% COMPACTION	58	30	15	27	35	
C.B.R. @ 98 % COMPACTION	41	21	13	19	28	
C.B.R. @ 95 % COMPACTION	24	13	10	11	20	
C.B.R. @ 93 % COMPACTION	17	10	8	8	14	
C.B.R. @ 90 % COMPACTION	10	8	7	4	11	
SWELL @ 100% COMP. (%)	0.40	0.20	0.30	0.40	0.30	
T R H 14 CLASSIFICATION	G7	G8	G9	G10	G8	

The above test results are pertinent to the samples tested only. While the tests are carried out according to recognized standards, ControlLab shall not be liable for erroneous testing or reporting thereof. This report may not be reproduced except in full without prior consent of ControlLab.

Technical Signatory:

[Signature]
Atterburg

Remarks:
Sample Delivered by Customer
Sampled by ControlLab: YES

Page 2 of 4

STR001

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Testing Laboratory

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HEAD OFFICE: 1 Alfred Road, Vincent 6247, Tel: 043 728 7859, Fax: 043 726 7426

CENTRAL LABORATORY: 10 St Pauls Road, East London, 5201, Tel: 043 722 5420 / 722 6585, Fax: 043 743 9942, P O Box 346, East London, 5200

OTHER BRANCH OFFICES: Cape Town, Kokstad, Johannesburg, Mthatha, Queenstown, Lusaka - Zambia

CLIENT: Delta Built Environment Consultants
P O Box 35703
Menlo Park
PRETORIA
0102

PROJECT: CONSTRUCTION OF RUNWAY
ACCESS ROADS & TURNING EAR
AT E.L. AIRPORT

DATE RECEIVED: 2018-11-05

DATE TESTED: 2018-12-03

DATE REPORTED: 2018-12-11

TEST REPORT NO.: 92639

ATT: Mr P Agema

MATERIALS TEST REPORT

SAMPLE NO.	6451	6452	6453	6454	6455
POSITION / CHAINAGE	TP 4		TP 5		
DEPTH mm	160 - 350	350 - 460	460 - 640	0 - 240	240 - 800
DESCRIPTION	dk Br	dk Br	dk Ol	dk Br	lt R O
	Qtzte	sdv st	Sh +	sdv st	dec Dol +
	C/run		sdv st		Dol

Sieve Analysis (Wet Preparation) SANS 3001 - Part AG1

% PASSING	75 mm	63 mm	50 mm	37.5 mm	28 mm	20 mm	14 mm	5 mm	2.00 mm	0.425 mm	0.075 mm
				100	97	97	92	55	28	10	1.4
						100	97	88	82	74	35.5
					100	97	94	83	76	66	32.6
				100	97	97	94	87	82	73	31.0
					100	98	96	88	76	41	20.0

Soil Mortar Analysis - SANS 3001 - PR5

COURSE SAND (%)	64	10	13	11	46
FINE SAND (%)	31	47	44	51	28
SILT / CLAY (%)	5	43	43	38	26
GRADING MODULUS	2.61	1.09	1.25	1.14	1.63

Atterberg Limits - SANS 3001 - GR10 & GR11

LIQUID LIMIT (%)	CBD	CBD	CBD	CBD	31
PLASTICITY INDEX (%)	NP	NP	SP	NP	7
LINEAR SHRINKAGE (%)	0.0	0.0	1.0	0.0	3.0

Maximum Dry Density & Optimum Moisture Content - SANS 3001 - GR30 / California Bearing Ratio - SANS 3001 - GR40

Maximum Dry Density (kg/m ³)	2130	2020	1992	2038	2122
Optimum Moisture Content (%)	7.3	9.3	10.2	9.0	10.9
C.B.R. @ 100% COMPACTION	58	14	14	27	80
C.B.R. @ 98% COMPACTION	41	11	10	20	58
C.B.R. @ 95% COMPACTION	27	7	5	13	33
C.B.R. @ 93% COMPACTION	20	6	4	10	23
C.B.R. @ 90% COMPACTION	13	4	2	6	15
SWELL @ 100% COMP. (%)	0.10	0.30	0.40	0.40	0.30
T R H 14 CLASSIFICATION	G6	G10	G10	G8	G7 / G6

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Remarks:

Sample Delivered by Customer

Sampled by Controlab: YES

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10308

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OTHER BRANCH OFFICES: Cape Town, Kokstad, Johannesburg, Mthatha, Queenstown, Lusaka - Zambia

CLIENT : Delta Built Environment Consultants
P O Box 35703
Menlo Park
PRETORIA
0102

PROJECT: CONSTRUCTION OF RUNWAY
ACCESS ROADS & TURNING EAR
AT E.L. AIRPORT

DATE RECEIVED: 2018-11-09

DATE TESTED: 2018-12-10

DATE REPORTED: 2018-12-11

TEST REPORT NO.: 92639

ATT: Mr P Agema

MATERIALS TEST REPORT

SAMPLE NO:	6571	6572	6573	6574	6575
POSITION / CHAINAGE	TP 6		TP 7		
DEPTH mm	0 - 320	320 - 600	600 - 800	0 - 260	260 - 800
DESCRIPTION	lt Br	dk R Br	lt Y O	dk Br	lt Br
	dec Dol +	Sh +	weath Sh +	sdv st	Sh +
	Dol	sdv st	Ferr + sdv st		sdv st

Sieve Analysis (Wet Preparation) SANS 3001 - Part AG1

% PASSING 75 mm					
63 mm					
50 mm					
37.5 mm					
28 mm	100	100	100	100	100
20 mm	93	99	98	98	90
14 mm	83	98	95	97	83
5 mm	65	94	85	91	73
2.00 mm	57	92	81	85	64
0.425 mm	45	89	74	75	51
0.075 mm	22.2	51.4	40.7	59.3	34.9

Soil Mortar Analysis - SANS 3001 - PRS

COURSE SAND (%)	21	3	9	12	20
FINE SAND (%)	40	41	41	18	25
SILT / CLAY (%)	39	56	50	70	55
GRADING MODULUS	1.76	0.68	1.04	0.81	1.50

Atterberg Limits - SANS 3001 - GR10 & GR11

LIQUID LIMIT (%)	CBD	CBD	CBD	21	24
PLASTICITY INDEX (%)	SP	NP	NP	4	6
LINEAR SHRINKAGE (%)	1.5	0.0	0.0	2.0	3.0

Maximum Dry Density & Optimum Moisture Content - SANS 3001 - GR30 / California Bearing Ratio - SANS 3001 - GR40

Maximum Dry Density (kg/m ³)	2172	2026	2016	1974	2216
Optimum Moisture Content (%)	6.7	9.7	10.5	10.4	8.4
C.B.R. @ 100% COMPACTION	54	12	12	19	23
C.B.R. @ 98 % COMPACTION	39	11	9	16	17
C.B.R. @ 95 % COMPACTION	24	10	6	11	11
C.B.R. @ 93 % COMPACTION	17	8	5	7	8
C.B.R. @ 90 % COMPACTION	12	6	4	6	5
SWELL @ 100% COMP. (%)	0.50	0.30	0.30	0.40	0.50
T R H 14 CLASSIFICATION	G6	G9	G10	G9	G9

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Remarks:

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CLIENT: Delta Built Environment Consultants
P O Box 35703

Menlo Park

PRETORIA, 0102

ATT: Mr P Agema

PROJECT: CONSTRUCTION OF RUNWAY
ACCESS ROADS & TURNING EAR
AT E.L. AIRPORT

DATE: 2018-12-11

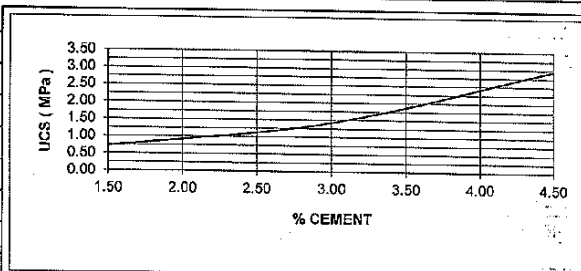
REF: 92639

STABILIZATION CURVE

SAMPLE NO:	6455	STAB. AGENT	AFRSAM ROADSTAB 32,5N
POSITION	TP 5 240mm - 800mm		
DESCRIPTION	lt R O dec Dol + Dol		

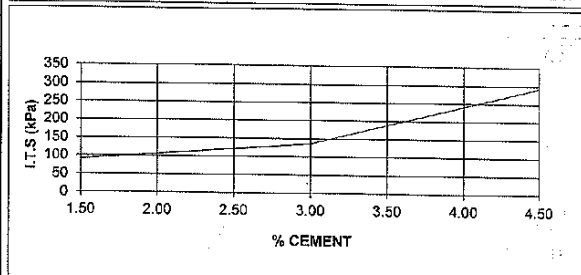
SIEVE ANALYSIS

PASSING	63 mm	
	50 mm	
	37.5 mm	
	28 mm	
	20 mm	100
	14 mm	98
	5.00 mm	88
	2.00 mm	76
	0.425 mm	41
	0.075 mm	20



SOIL MORTAR ANALYSIS

COARSE SAND	46
FINE SAND	28
SILT / CLAY	26
GRADING MODULUS	1.63



CBR / UCS / ITS DATA		% CEMENT	1.50	3.00	4.50
MOD AASHTO	2122	U.C.S. (mpa)	0.71	1.42	2.95
O.M.C. (%)	10.9	DRY DENSITY	2075	2064	2047
CBR @ 100% COMP.	80	% COMPACTION	99.8	99.3	98.5
CBR @ 98% COMP.	58	I.T.S. (kpa)	91	136	293
CBR @ 95% COMP.	33	DRY DENSITY	2082	2077	2055
CBR @ 93% COMP.	23	% COMPACTION	100.1	99.9	98.8
CBR @ 90% COMP.	15	MOD AASHTO	2079	2079	2079
SWELL	0.30	O.M.C. (%)	11.7	11.7	11.7

SOIL CONSTANTS

LIQUID LIMIT	31		CBD	CBD	CBD
PLASTICITY INDEX	7		SP	SP	NP
LINEAR SHRINKAGE	3.0		0.1	0.1	0.0
TRM14 CLASSIFICATION	G7/G6				

Technical Signatory:

[Signature]
L. Alterbury

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CLIENT: Delta Built Environment Consultants

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Menlo Park

PRETORIA

0102

PROJECT: CONSTRUCTION OF RUNWAY

ACCESS ROADS & TURNING EAR

AT E.L. AIRPORT

DATE RECEIVED: 2018-11-01

DATE TESTED: 2018-11-01

DATE REPORTED: 2018-12-11

TEST REPORT NO.: 92639

ATT: Mr P Agema

SAMPLING METHOD:

As instructed by the Client

COMPACTION CONTROL REPORT

TEST METHOD: SANS 3001 : NG 5

JOB: TP 1

TESTER: David Lee

LAYER :

SAMPLE No.	CHAINAGE & POSITION	LAYER THICKNESS mm	DEPTH OF PROBE mm	MATERIAL DESCRIPTION	LAB DATA		FIELD DATA		
					O.M.C %	M.D.D. kg/m³	DRY DENSITY kg/m³	COMP. %	M.C. %
6442	TP 1	0 - 300	0-150	dk Br sdy st	9.7	1960	1626	83.0	6.1
6443	TP 1	300 - 500	0-150	dk Br sdy st + Ferr	11.3	2232	1766	79.1	10.6
6444	TP 1	500 - 800	0-150	lt Y O weath Ss + cly st	13.1	1917	1487	77.6	30.5

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Troxler Serial No.

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CLIENT: Delta Built Environment Consultants

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Menlo Park

PRETORIA

0102

PROJECT: CONSTRUCTION OF RUNWAY

ACCESS ROADS & TURNING EAS

AT E.L. AIRPORT

DATE RECEIVED: 2018-11-01

DATE TESTED: 2018-11-01

DATE REPORTED: 2018-12-11

ATT: Mr P Agema

TEST REPORT NO.: 92839

SAMPLING METHOD:

As instructed by the Client

COMPACTION CONTROL REPORT

TEST METHOD: SANS 3001 : NG 5

JOB: TP 2

LAYER:

TESTER: David Lee

SAMPLE No.	CHAINAGE & POSITION	LAYER THICKNESS mm	DEPTH OF PROBE mm	MATERIAL DESCRIPTION	LAB DATA		FIELD DATA		
					O.M.C %	M.D.D. kg/m ³	DRY DENSITY kg/m ³	COMP. %	M.C. %
6450	TP 2	0 - 200	0-150	dk Br sdy st	7.1	2324	2047	88.1	7.2
6445	TP 2	200 - 400	0-150	dk Y O Dol + dec Dol	10.7	2086	1952	93.6	7.2
6446	TP 2	400 - 600	0-150	lt Y O dec Dol	8.6	2088	1829	87.6	10.9
6447	TP 2	600 - 790	0-150	dk Br sdy st	9.7	2018	1929	95.6	9.6

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PRETORIA

0102

PROJECT: CONSTRUCTION OF RUNWAY

ACCESS ROADS & TURNING EAR

AT E.L. AIRPORT

DATE RECEIVED: 2018-11-01

DATE TESTED: 2018-11-01

DATE REPORTED: 2018-12-11

ATT: Mr P Agema

TEST REPORT NO.: 92639

SAMPLING METHOD:

As instructed by the Client

COMPACTION CONTROL REPORT

TEST METHOD: SANS 3001 : NG 5

JOB: TP 3

LAYER:

TESTER: David Lee

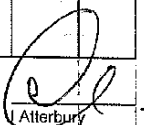
SAMPLE No.	CHAINAGE & POSITION	LAYER THICKNESS mm	DEPTH OF PROBE mm	MATERIAL DESCRIPTION	LAB DATA		FIELD DATA		
					O.M.C %	M.D.D. kg/m ³	DRY DENSITY kg/m ³	COMP. %	M.C. %
6448	TP 3	0 - 540	0-150	lt Br sdy st + Sh	9.7	2018	1700	84.2	8.1
6449	TP 3	540 - 760	0-150	lt R Br weath Sh	10.9	1989	1745	87.7	15.4

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CLIENT: Delta Built Environment Consultants

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PROJECT: CONSTRUCTION OF RUNWAY

ACCESS ROADS & TURNING EAS

AT E.L. AIRPORT

DATE RECEIVED: 2018-11-01

DATE TESTED: 2018-11-01

DATE REPORTED: 2018-12-11

TEST REPORT NO.: 92639

ATT: Mr P Agema

SAMPLING METHOD:

As instructed by the Client

COMPACTION CONTROL REPORT

TEST METHOD: SANS 3001 : NG 5

JOB: TP 4

LAYER:

TESTER: David Lee

SAMPLE No.	CHAINAGE & POSITION	LAYER THICKNESS mm	DEPTH OF PROBE mm	MATERIAL DESCRIPTION	LAB DATA		FIELD DATA		
					O.M.C %	M.D.D. kg/m ³	DRY DENSITY kg/m ³	COMP. %	M.C. %
6451	TP 4	160 - 350	0-150	dk Br Qtzite Crusherrun	7.3	2130	1901	89.2	9.4
6452	TP 4	350 - 460	0-150	dk Br sdy st	9.3	2020	1949	95.5	9.4
6453	TP 4	460 - 640	0-150	dk Ol Sh + sdy st	10.2	1992	1450	72.8	17.0

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CLIENT: Delta Built Environment Consultants

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PROJECT: CONSTRUCTION OF RUNWAY

ACCESS ROADS & TURNING EAR

AT E.L. AIRPORT

DATE RECEIVED: 2018-11-01

DATE TESTED: 2018-11-01

DATE REPORTED: 2018-12-11

ATT: Mr P Agema

TEST REPORT NO.: 92639

SAMPLING METHOD:

As instructed by the Client

COMPACTION CONTROL REPORT

TEST METHOD: SANS 3001 : NG 5

JOB: TP 5

TESTER: David Lee

LAYER:

SAMPLE No.	CHAINAGE & POSITION	LAYER THICKNESS mm	DEPTH OF PROBE mm	MATERIAL DESCRIPTION	LAB DATA		FIELD DATA		
					O.M.C %	M.D.D. kg/m ³	DRY DENSITY kg/m ³	COMP. %	M.C. %
6454	TP 5	0 - 240	0-150	dk Br sdy st	9.0	2038	1805	88.6	12.3
6455	TP 5	240 - 800	0-150	lt R O dec Dol + Dol	10.9	2122	1841	86.8	11.8

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PROJECT: CONSTRUCTION OF RUNWAY

ACCESS ROADS & TURNING EAR

AT E.L. AIRPORT

DATE RECEIVED: 2018-11-01

DATE TESTED: 2018-11-01

DATE REPORTED: 2018-12-11

TEST REPORT NO.: 92639

ATT: Mr P Agerna

SAMPLING METHOD:

As instructed by the Client

COMPACTION CONTROL REPORT

TEST METHOD: SANS 3001 : NG 5

JOB: TP 6

TESTER: David Lee

LAYER :

SAMPLE No.	CHAINAGE & POSITION	LAYER THICKNESS mm	DEPTH OF PROBE mm	MATERIAL DESCRIPTION	LAB DATA		FIELD DATA		
					O.M.C %	M.D.D. kg/m ³	DRY DENSITY kg/m ³	COMP. %	M.C. %
6571	TP 6	0 - 320	0-150	lt Br dec Dol + Dol	6.7	2172	1801	82.9	14.8
6572	TP 6	320 - 600	0-150	dk R Br Sh + sdy st	9.7	2026	1792	88.5	12.8
6573	TP 6	600 - 810	0-150	lt Y O weath Ss + sdy st	10.5	2016	1581	78.4	21.9

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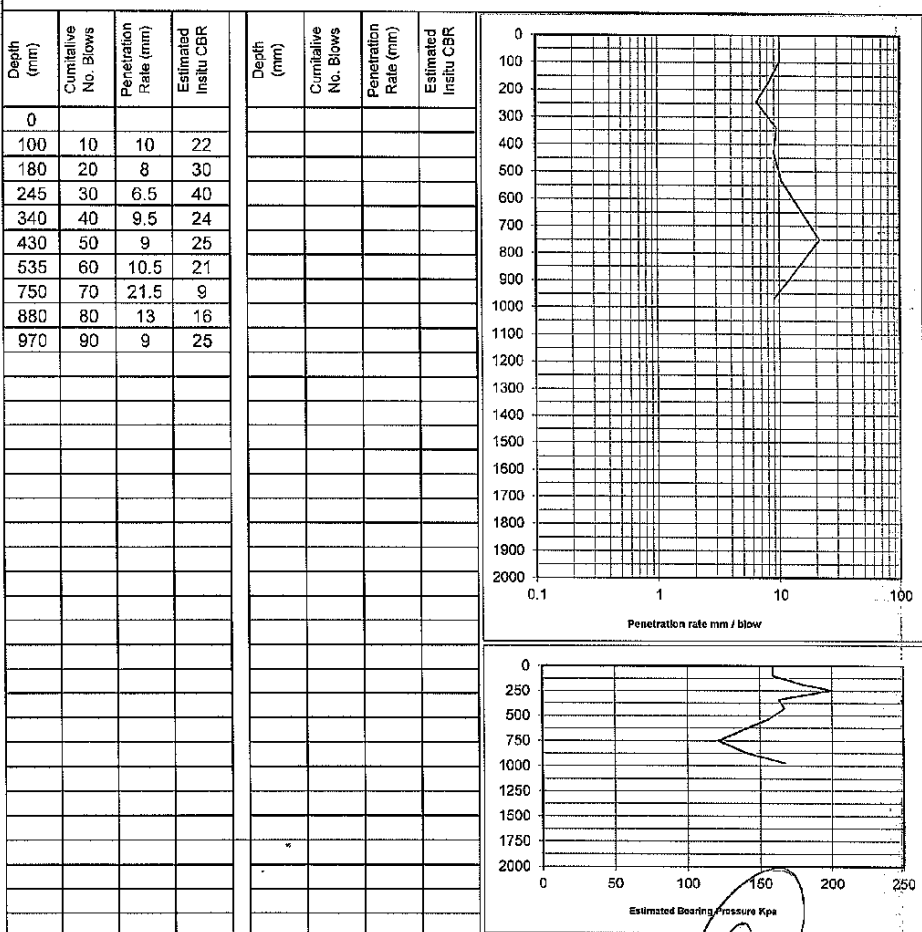
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P O Box 35703
Menlo Park
PRETORIA, 0102
ATT: Mr P Agema

PROJECT: CONSTRUCTION OF RUNWAY
ACCESS ROADS & TURNING EAR
AT E.L. AIRPORT
TEST REPORT NO: 92639
DATED: 2018-11-27

DYNAMIC CONE PENETROMETER DATA

POSITION: DCP A
S 33°01'42.3" E 27°49'58.2"

REMARKS: No Refusal



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PRETORIA, 0102

ATT: Mr P Agema

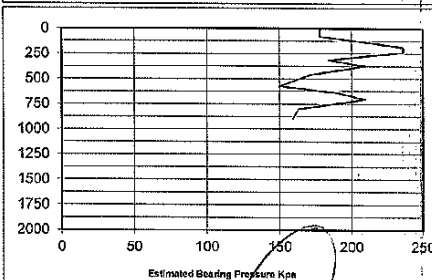
PROJECT: CONSTRUCTION OF RUNWAY
ACCESS ROADS & TURNING EARS
AT E.L. AIRPORT

REPORT NO: 92639

DATED: 2018-11-27

DYNAMIC CONE PENETROMETER DATA

REMARKS: No Refusal

[illegible]

Technical Signatory: J Atterbury

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**PROJECT: CONSTRUCTION OF RUNWAY
ACCESS ROADS & TURNING EAR
AT E.L. AIRPORT**

ATT: P O Box 35703
Menlo Park
PRETORIA, 0102
Mr P Agema

TEST REPORT NO: 92639
DATED: 2018-11-27

DYNAMIC CONE PENETROMETER DATA

POSITION: DCP C
S 33°02'03.3" E 27°49'45.1"

REMARKS: No Refusal

[illegible]

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CLIENT: Delta Built Environment Consultants

P O Box 35703

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PRETORIA, 0102

ATT: Mr P Agema

PROJECT: CONSTRUCTION OF RUNWAY

ACCESS ROADS & TURNING EAR

AT E.L. AIRPORT

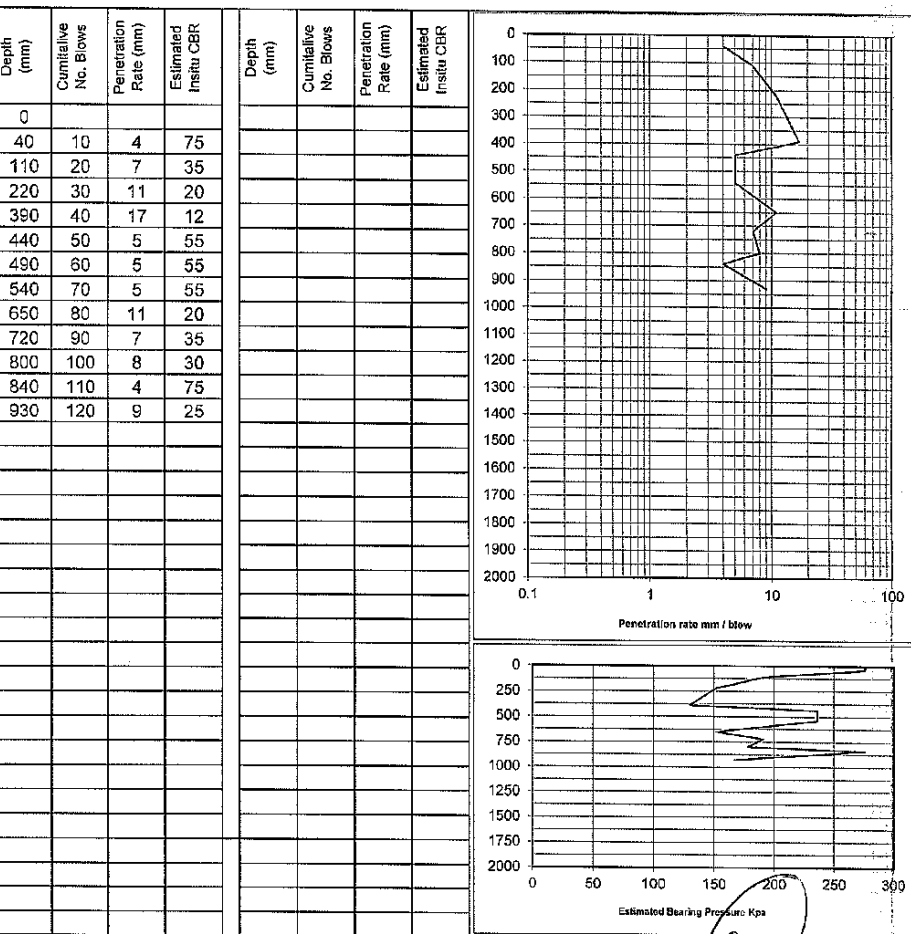
TEST REPORT NO: 92639

DATED: 2018-11-27

DYNAMIC CONE PENETROMETER DATA

POSITION: DCP D
S 33°02'03.5" E 27°49'29.5"

REMARKS: No Refusal



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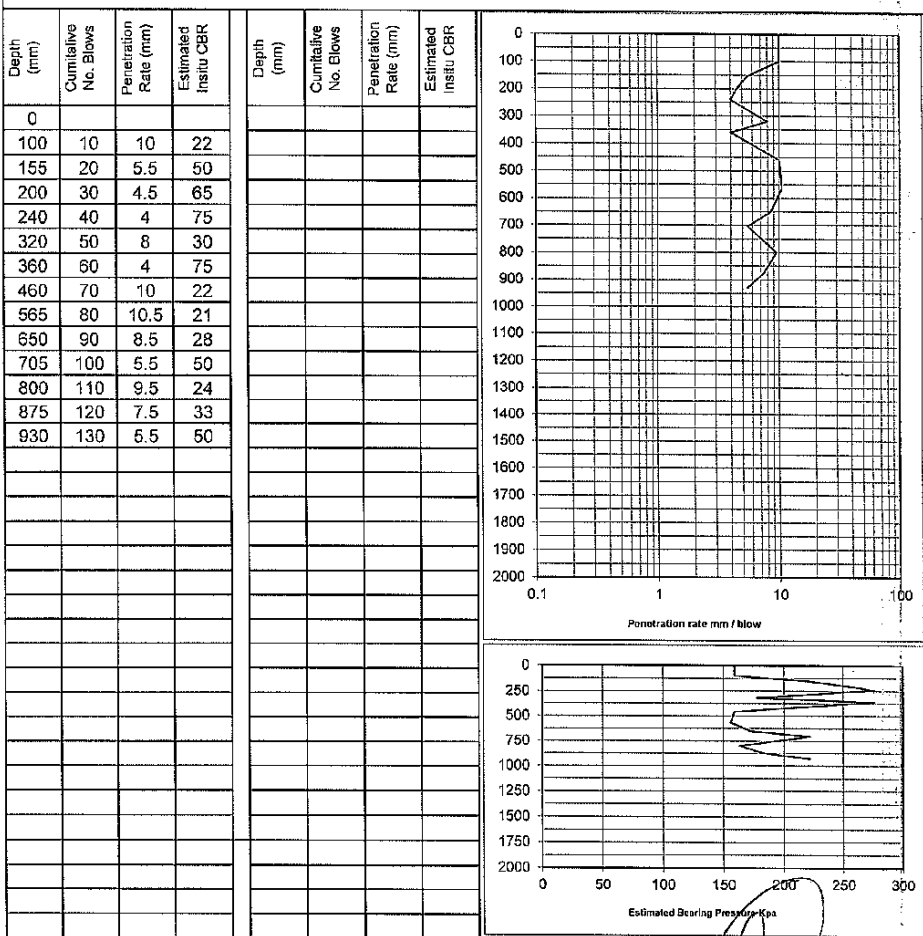
CLIENT: Delta Built Environment Consultants
P O Box 35703
Menlo Park
PRETORIA, 0102
ATT: Mr P Agema

PROJECT: CONSTRUCTION OF RUNWAY
ACCESS ROADS & TURNING EAR
AT E.L. AIRPORT
TEST REPORT NO: 92639
DATED: 2018-11-27

DYNAMIC CONE PENETROMETER DATA

POSITION: DCP E
S 33°02'08.2" E 27°48'56.2"

REMARKS: No Refusal



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PROJECT: CONSTRUCTION OF RUNWAY
ACCESS ROADS & TURNING EAR
AT E.L. AIRPORT

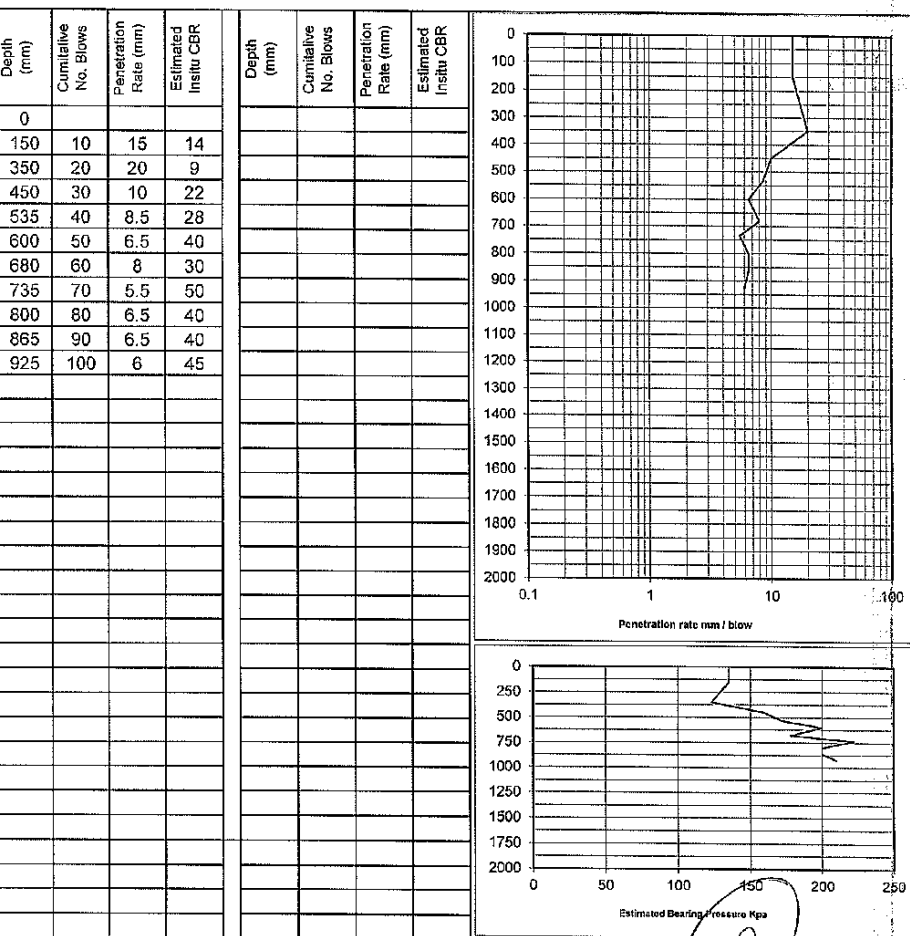
TEST REPORT NO: 92639

DATED: 2018-11-27

DYNAMIC CONE PENETROMETER DATA

POSITION: DCP F
S 33°02'16.3" E 27°48'36.6"

REMARKS: No Refusal



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PROJECT: CONSTRUCTION OF RUNWAY
ACCESS ROADS & TURNING EAS
AT E.L. AIRPORT

TEST REPORT NO: 92639

DATED: 2018-11-27

DYNAMIC CONE PENETROMETER DATA

POSITION: DCP G
S 33°02'04.7" E 27°50'10.0"

REMARKS: No Refusal

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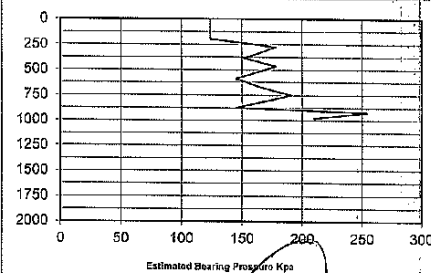
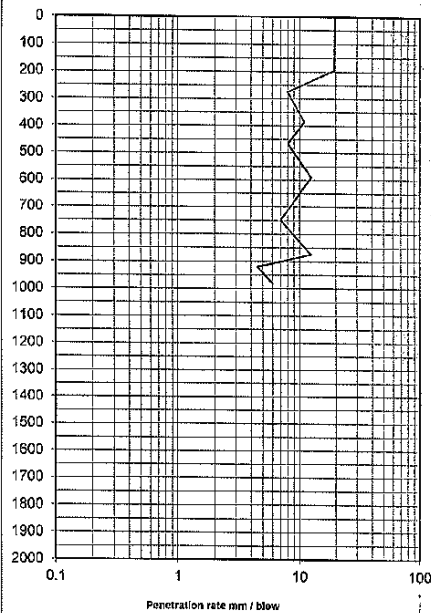
PROJECT: CONSTRUCTION OF RUNWAY
ACCESS ROADS & TURNING EAS
AT E.L. AIRPORT

REPORT NO: 92639

DATED: 2018-11-27

POSITION: DCP H
S 33°02'36.4" E 27°49'12.2"

REMARKS: No Refusal

[illegible]

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ACCESS ROADS & TURNING EAR

AT E.L. AIRPORT

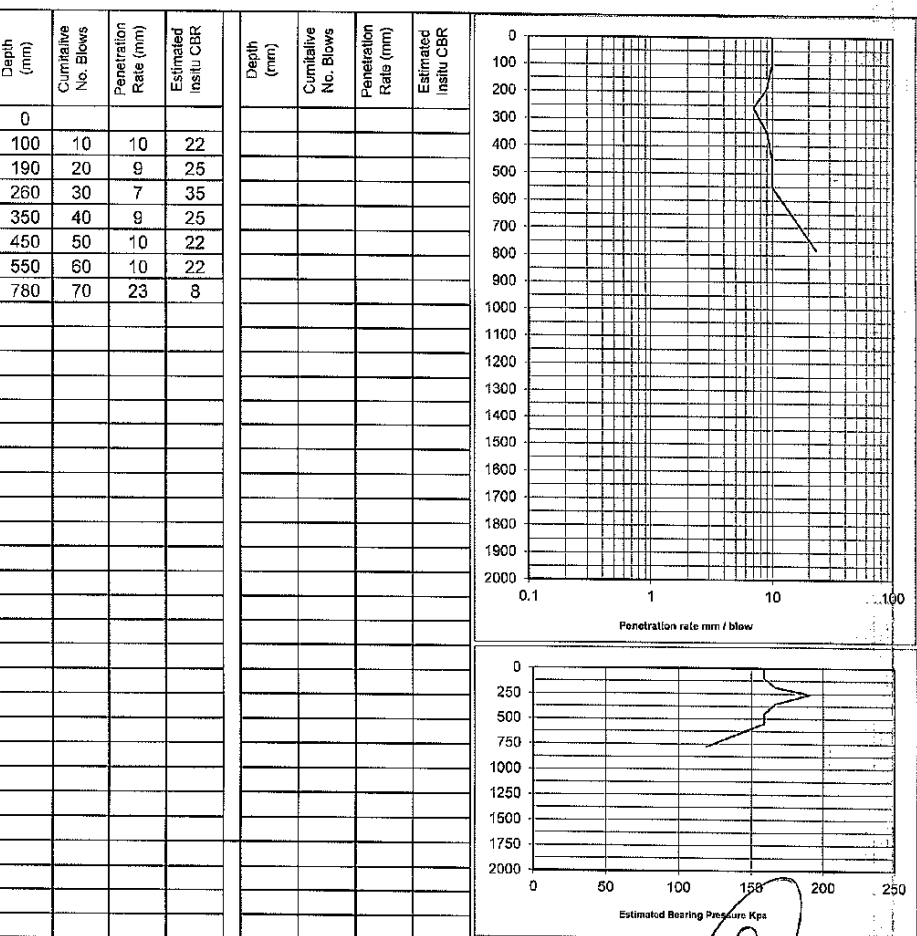
TEST REPORT NO: 92639

DATED: 2018-11-27

DYNAMIC CONE PENETROMETER DATA

POSITION: TP 1
S 33°01'49.7" E 27°49'51.5"

REMARKS: No Refusal



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ACCESS ROADS & TURNING EAR

AT E.L. AIRPORT

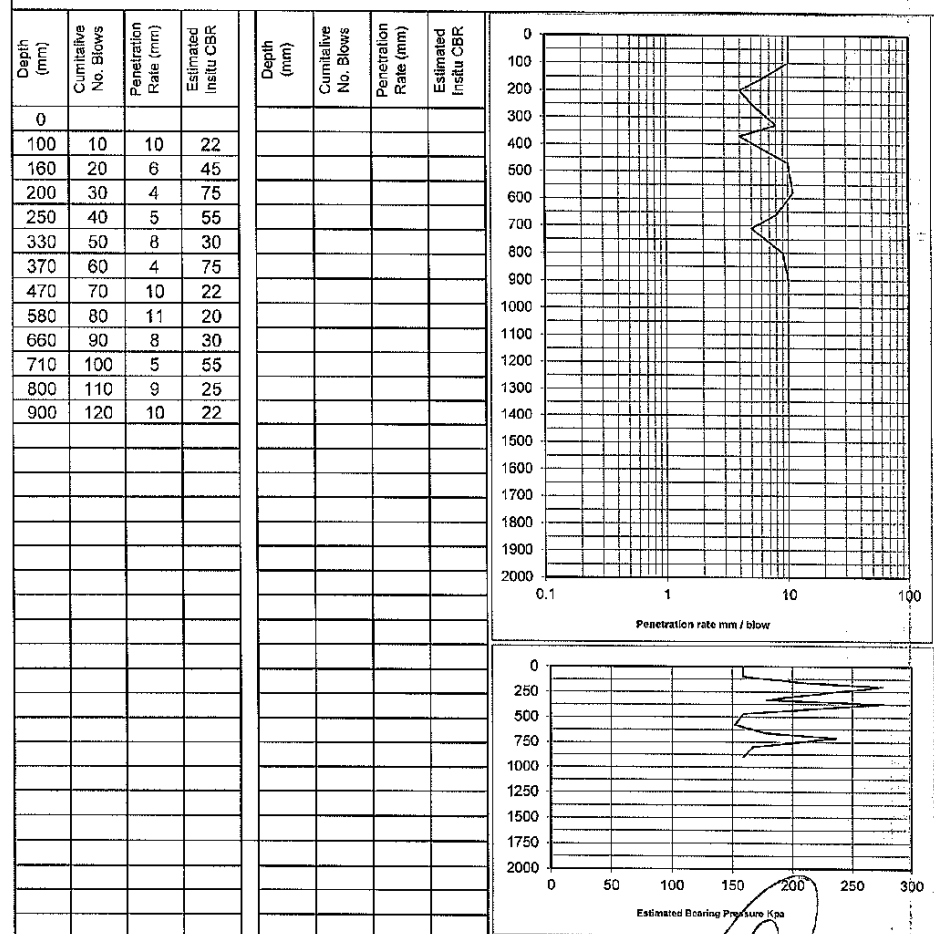
TEST REPORT NO: 92639

DATED: 2018-11-27

DYNAMIC CONE PENETROMETER DATA

POSITION: TP 2
S 33°01'50.7" E 27°49'48.0"

REMARKS: No Refusal



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CLIENT: Delta Built Environment Consultants
P O Box 35703
Menlo Park
PRETORIA, 0102

ATT: Mr P Agema

**PROJECT: CONSTRUCTION OF RUNWAY
ACCESS ROADS & TURNING EAS
AT E.L. AIRPORT**

TEST REPORT NO: 92639
DATED: 2018-11-27

DYNAMIC CONE PENETROMETER DATA

POSITION: TP 3
S 33°02'03.4" E 27°49'43.7"

REMARKS: Refusal @ 465mm

[illegible]

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ACCESS ROADS & TURNING EAS
AT E.L. AIRPORT**

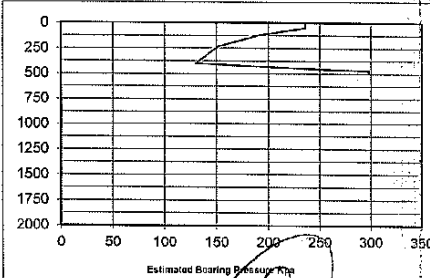
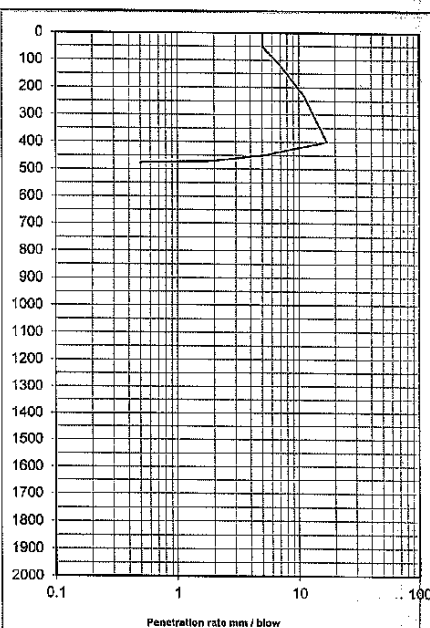
TEST REPORT NO: 92639
DATED: 2018-11-27

DYNAMIC CONE PENETROMETER DATA

POSITION: TP 4
S 33°02'06.6" E 27°49'29.1"

REMARKS: Refusal @ 480mm

Depth (mm)	Cumulative No. Blows	Penetration Rate (mm)	Estimated Insitu CBR
0			
50	10	5	55
120	20	7	35
230	30	11	20
400	40	17	12
450	50	5	55
470	60	2	>110
475	70	0.5	>110
480	80	0.5	>110

[illegible]

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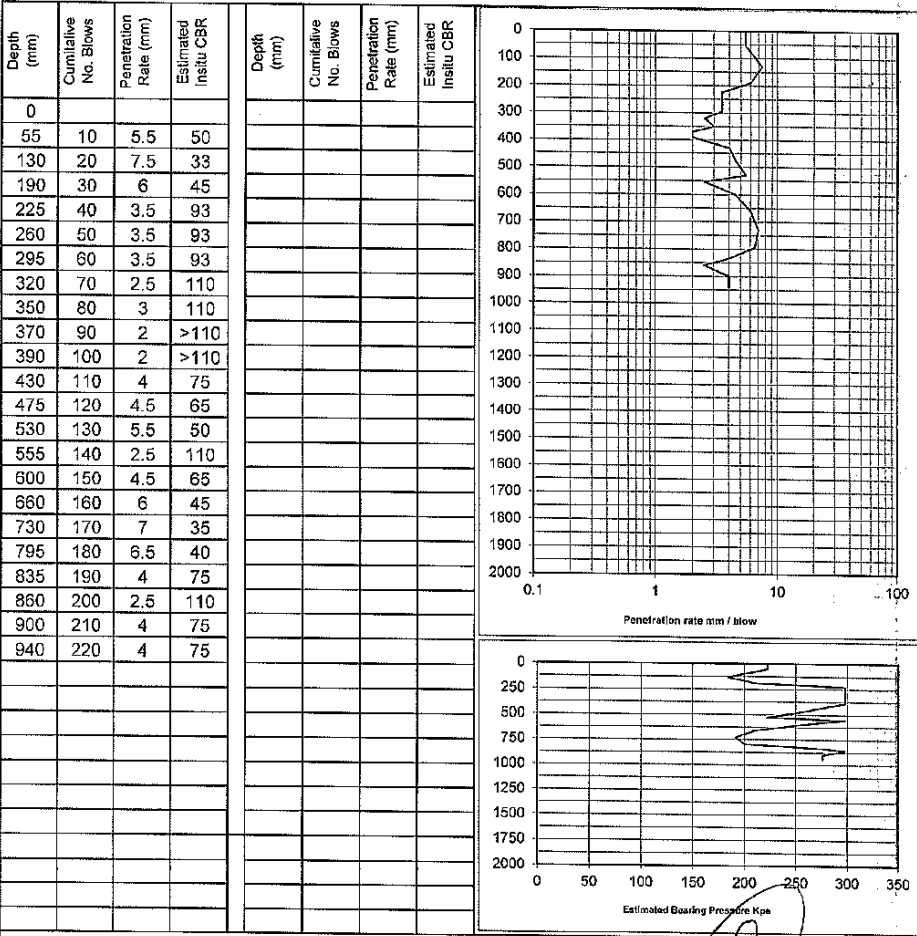
CLIENT: Delta Built Environment Consultants
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Menlo Park
PRETORIA, 0102
ATT: Mr P Agema

PROJECT: CONSTRUCTION OF RUNWAY
ACCESS ROADS & TURNING EAR
AT E.L. AIRPORT
TEST REPORT NO: 92639
DATED: 2018-11-27

DYNAMIC CONE PENETROMETER DATA

POSITION: TP 5
S 33°02'32.7" E 27°49'15.3"

REMARKS: No Refusal



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ATT: Mr P Agema

DATED: 2018-11-27

POSITION: TP 6
S 33°02'05.9" E 27°49'58.8"

REMARKS: No Refusal

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CLIENT: Delta Built Environment Consultants

P O Box 35703

Menlo Park

PRETORIA, 0102

ATT: Mr P Agema

PROJECT: CONSTRUCTION OF RUNWAY

ACCESS ROADS & TURNING EAR

AT E.L. AIRPORT

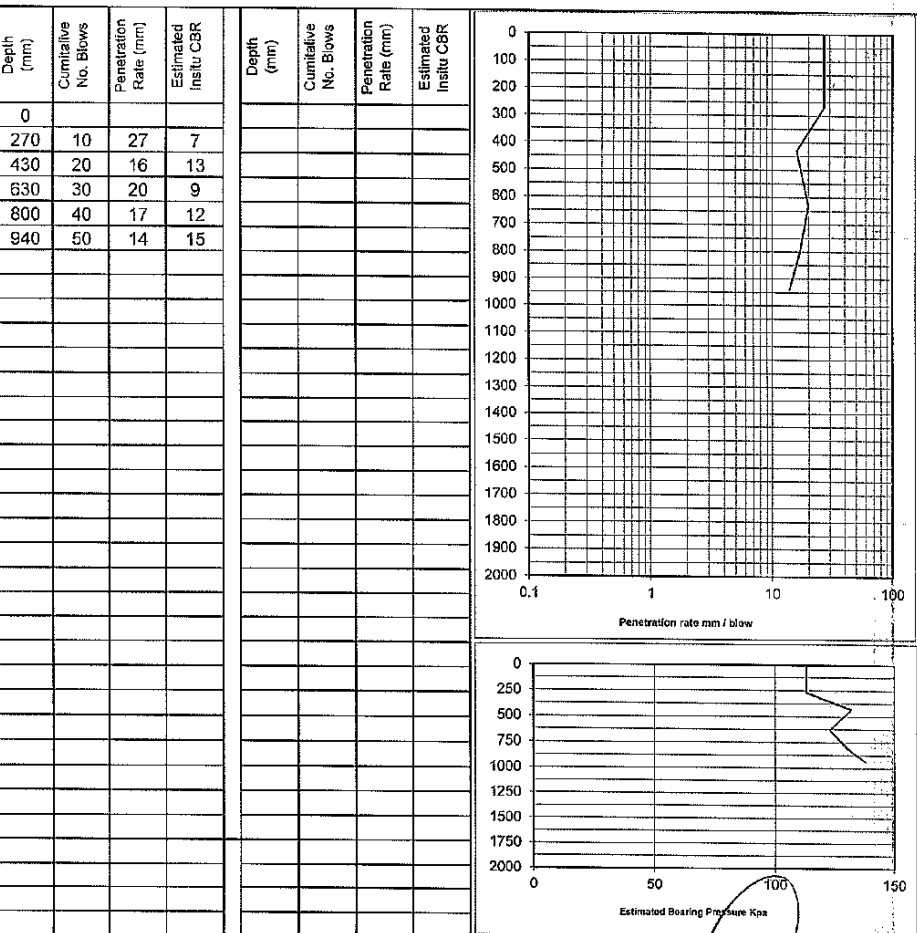
TEST REPORT NO: 92639

DATED: 2018-11-27

DYNAMIC CONE PENETROMETER DATA

POSITION: TP 7
S 33°02'16.6" E 27°49'43.2"

REMARKS: No Refusal



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CLIENT: Delta Built Environment Consultants

TRIAL PIT No.'s : 1, 2, 3

CONSTRUCTION OF RUNWAY

EXCAVATED BY: HAND

ACCESS ROADS & TURNING EAR AT E.L.

DATE: 01-11-2018

AIRPORT

REF: 92639

TEST PIT LOGS

Position: Trial Hole 1

S 33°01'49.7"

E 27°49'51.5"

0.0

Slightly moist, dark Brown, firm to soft, intact, sandy silt + Roots.

Imported: 0.1

0.2

Moist, dark Brown, soft, intact, sandy silt + Ferricrete.

Transported: 0.3

0.4

Slightly moist, light Yellow/Orange, firm, intact, weathered Sandstone + clayey silt. Residual: 0.5

0.6

0.7

0.8

0.9

1.0

1.1

1.2

1.3

1.4

1.5

SAMPLES TAKEN: 6442, 6443, 6444

No ground water.

No refusal @ 800mm

Position: Trial Hole 2

S 33°01'50.7"

E 27°49'48.0"

0.0

Slightly moist, dark Brown, firm, intact, sandy silt + Roots.

Imported: 0.2

0.3

Slightly moist, dark Yellow, medium dense, intact, decomposed Dolerite + Dolerite.

Imported: 0.4

0.5

Slightly moist, light Yellow/Orange, medium dense, intact, decomposed Dolerite.

Imported: 0.6

0.7

0.8

0.9

1.0

1.1

1.2

1.3

1.4

1.5

Slightly moist, dark Brown, soft, intact, sandy silt.

Transported: 0.7

0.8

0.9

1.0

1.1

1.2

1.3

1.4

1.5

SAMPLES TAKEN: 6445, 6446, 6447

No ground water.

No refusal @ 790mm

Position: Trial Hole 3

S 33°02'03.4"

E 27°49'43.7"

0.0

Slightly moist, light Brown, soft, intact, sandy silt + Roots + Shale.

Imported: 0.2

0.3

0.4

0.5

0.6

0.7

0.8

0.9

1.0

1.1

1.2

1.3

1.4

1.5

Slightly moist, light Red Brown, soft, intact, weathered Sandstone + sandy silt.

Residual: 0.7

0.8

0.9

1.0

1.1

1.2

1.3

1.4

1.5

SAMPLES TAKEN: 6448, 6449

No ground water.

No refusal @ 760mm

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TEST PIT LOGS

Position: Trial Hole 4

S 33°02'06.6"
 E 27°49'29.1"

0.0	
Premix. Imported:	
0.1	
Slightly moist, dark Brown, dense, intact, Quartzite Crusherrun.	
Imported:	
0.2	
Moist, dark Brown, stiff, intact, sandy silt. Imported:	
Slightly moist, dark Olive, medium dense, intact, Shale + sandy silt.	
Residual:	
0.4	
0.5	
0.6	
0.7	
0.8	
0.9	
1.0	
1.1	
1.2	
1.3	
1.4	
1.5	

SAMPLES TAKEN: 6451, 6452, 6453
 No ground water.
 No refusal @ 640mm

Position: Trial Hole 5

S 33°02'32.7"
 E 27°49'15.3"

0.0	
Slightly moist, dark Brown, firm, intact, sandy	
0.1	
silt + Roots.	
Imported:	
0.2	
Slightly moist, light Red Orange, medium dense,	
0.3	
intact, decomposed Dolerite +	
0.4	
Dolerite. Imported:	
0.5	
0.6	
0.7	
0.8	
0.9	
1.0	
1.1	
1.2	
1.3	
1.4	
1.5	

SAMPLES TAKEN: 6454, 6455
 No ground water.
 No refusal @ 800mm

Position: Trial Hole 6

S 33°02'05.9"
 E 27°49'58.8"

0.0	
Slightly moist, light Brown, firm, intact, decomposed	
0.1	
Dolerite + Dolerite.	
Roots.	
Imported:	
0.2	
Slightly moist, dark Red Brown, firm, intact, Shale +	
0.3	
sandy silt.	
Imported:	
0.4	
0.5	
0.6	
Slightly moist, light Yellow Orange, firm, intact,	
0.7	
weathered Sandstone + Ferricrete + sandy silt.	
Imported:	
0.8	
0.9	
1.0	
1.1	
1.2	
1.3	
1.4	
1.5	

SAMPLES TAKEN: 6571, 6572, 6573
 No ground water.
 No refusal @ 800mm

ACCESS ROADS & TURNING EAR AT E.L. AIRPORT

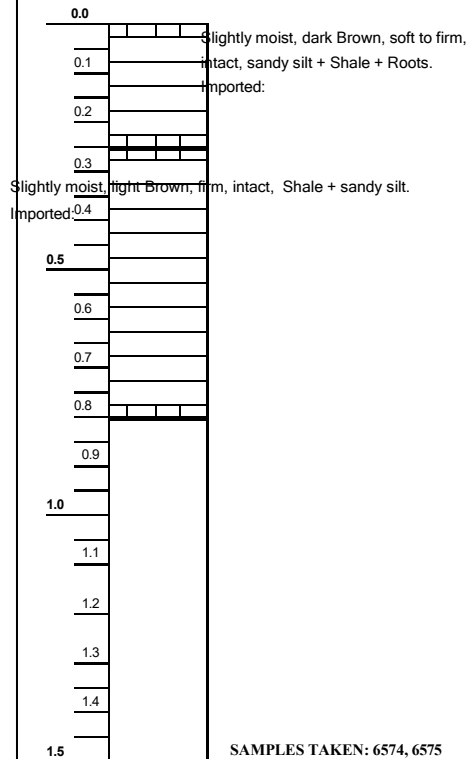
DATE: 08-11-2018

REF:

92639

TEST PIT LOGS

Position: Trial Hole 7
S 33°02'16.6"
E 27°48'43.2"



No ground water.
No refusal @ 800mm

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CLIENT:
PROJECT: **ControlLab South Africa (Pty) Ltd**
ACCESS ROADS & TURNING EAR EAST LONDON AIRPORT

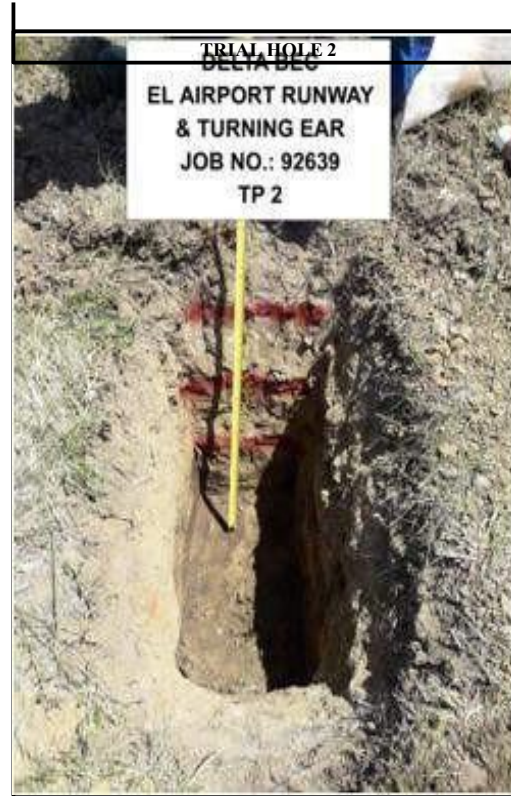
Delta Built Environment Consultants
CONSTRUCTION OF RUNWAY

TRIAL PIT No.'s : 1 - 3
EXCAVATED BY: HAND

REF: 92639

DATE: 01-11-2018

TEST PIT PHOTOGRAPHS



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CLIENT: Delta Built Environment Consultants

TRIAL PIT No.'s : 4 - 6

PROJECT:
ACCESS ROADS & TURNING EAR
EAST LONDON AIRPORT

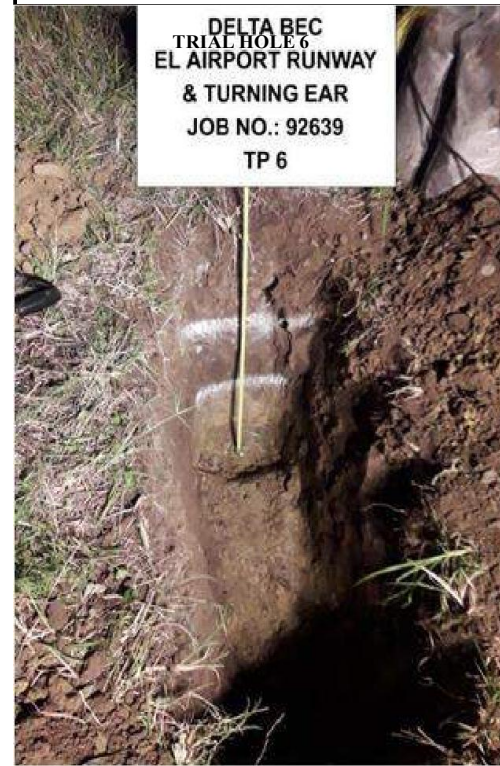
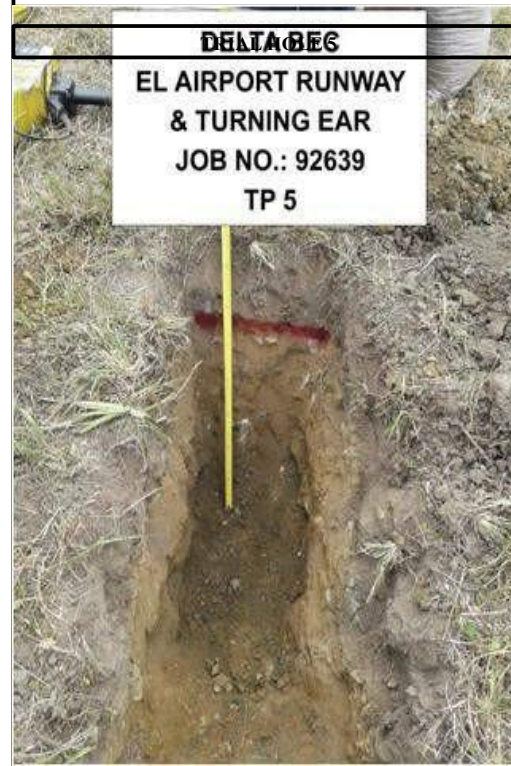
CONSTRUCTION OF RUNWAY

EXCAVATED BY: HAND

REF: 92639

DATE: 01-11-2018

TEST PIT PHOTOGRAPHS



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CLIENT: Delta Built Environment Consultants

TRIAL PIT No.'s : 7

PROJECT:
ACCESS ROADS & TURNING EAR
EAST LONDON AIRPORT

CONSTRUCTION OF RUNWAY

EXCAVATED BY: HAND

REF: 92639

DATE: 01-11-2018

TEST PIT PHOTOGRAPHS



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ISO/IEC 17025:2005 Accredited Laboratory
10308

Ref: 93083/REP/MLP/clw - 131218rep - Construction of Access Roads and Turning Ear at EL Airport (Delta BEC)

13 December 2018

Delta Built Environmental Consultants (Pty) Ltd P O Box
35703
MENLO PARK 0102

ATTENTION: MR P AGEMA

Dear Sir

P18034 – CONSTRUCTION OF THE RUNWAY ACCESS ROADS AND TURNING EAR AT EAST LONDON AIRPORT: CONCRETE DIAGNOSTIC TESTING

Controlab conducted a concrete integrity investigation on the Bay 1 apron slab at the East London Airport where the surface of the concrete was abraded of exposing the aggregate.

The investigation consisted of extracting five (5) concrete cores from Bay 1 the area under scrutiny and two (2) cores from Bay 5 where no abrasion was evident as a comparison. These cores were visually inspected for any evidence of cracks and alkali-aggregate reaction. Tests were also carried for compressive strength and any evidence of carbonation.



CHIEF EXECUTIVE OFFICER: ML PROUDFOOT Pr.Tech.Eng. (ECSA) R.Eng (EngRB of Zambia) MSc (Geotech Eng.)
DIRECTORS: D LOUW Pr.Tech.Eng. MSc (Civils) (MANAGING), L PROUDFOOT Pr.Sci.Nat MSc (OPERATIONS)

Level 3 B-BBEE Contributor



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1. TEST DATA AND VISUAL OBSERVATIONS

- Concrete Core Strengths

CONCRETE CORE STRENGTHS (Test Method: SANS 5865)							
Position	Apron Slab Bay 1					Apron Slab Bay 5	
Core Sample Number	1	2	3	4	5	6	7
Maximum Length (mm)	307	271	293	292	298	310	308.0
Density (kg/m³)	2395	2415	2369	2547	2392	2374	2357.0
Corrected Strength (MPa)	50.7	50.8	56.6	52.3	65.9	57.4	61.8

- Carbonation

CARBONATION							
Position	Apron Slab Bay 1					Apron Slab Bay 5	
Core Sample Number	1	2	3	4	5	6	7
Carbonation Depth (mm)	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Carbonation is the reaction of carbon dioxide in the environment with the calcium hydroxide in cement paste. The reaction produces calcium carbonate and lowers the pH to around 9. At this value the protective oxide layer surrounding of the reinforcing steel breaks down and corrosion becomes possible.

- Alkali – Aggregate Reactions (Visual Assessment)

ALKALI - AGGREGATE REACTION (VISUAL ASSESSMENT)							
Position	Apron Slab Bay 1					Apron Slab Bay 5	
Core Sample Number	1	2	3	4	5	6	7
Alkali -Aggregate Reaction	None	None	None	None	None	None	None

- Cracking

Cracking							
Position	Apron Slab Bay 1					Apron Slab Bay 5	
Core Sample Number	1	2	3	4	5	6	7
Depth of Cracks (mm)	35.0	50.0	Surface	None	45.0	Surface	None

2. SUMMARY OF DATA

Seven (7) cores were taken from the existing apron slabs at Bay 1 & 5. The lengths on Bay 1 ranged from 271mm to 307mm with an average length of 292.2mm and on Bay 5 the core lengths ranged from 308mm to 310mm with an average length of 309mm. The core strengths on Bay 1 ranged from 50.7MPa to 65.9MPa with an average of 55.3MPa and on Bay 5 the core strengths ranged from 57.4MPa to 61.8MPa with an average of 59.6MPa. No reinforcing was detected in the core sample. Visually the concrete looked well compacted with minimal voids evident in the cores. Visual assessment of the cores indicated that no Alkali – Aggregate Reaction was evident. There was good discolouration (pink) of the cores when sprayed with indicator solution; this will indicate that no carbonation is evident. Cores 1, 2 & 5 had cracks to a depth of 35mm, 50mm & 45mm from the surface respectively.

3. CONCLUSION

What is evident is that there is no difference in the quality of concrete from Bay 1 where the surface had abraded to the Bay 5 where no abrasion of the surface was evident. Bay 1 is the area where the larger passenger aeroplanes load and disembark the passengers. Therefore it would be assumed that the high abrasion value of the tyres of the larger aeroplanes and loading equipment was the reason for loss of the surface fines.

The cracks that had appeared in the concrete would have happened during construction when high evaporation rate resulted in plastic shrinkage cracking.

4. RECOMMENDATIONS

With the fine and coarse aggregate being exposed in Bay 1 there are a strong possibility of the aggregate being dislodged causing damage to the aeroplane motors. We would therefore recommend that these areas are treated with a product like Sikafloor CureHard-24 which improves dusting and chemical and abrasion resistance.

We trust that you find the above in order. Should you have any queries or require additional information, please do not hesitate to contact the undersigned.

Regards,



MARINUS PROUDFOOT
CHIEF EXECUTIVE OFFICER

Pr Tech Eng (ECSA), REng (EngRB of Zambia)



Controlab South Africa (Pty) Ltd

CIVIL ENGINEERING MATERIAL AND GEOTECHNICAL LABORATORY,
GEOTECHNICAL AND ENVIRONMENTAL SERVICES

www.controlab.co.za



ISO/IEC 17025:2005 Accredited Laboratory
TO308

HEAD OFFICE: 1 Alfred Road, Vincent 5247, Tel: 043 726 7859, Fax: 043 726 7426

CENTRAL LABORATORY: 10 St Pauls Road, East London, 5201, Tel: 043 722 5420 / 722 8565, Fax: 043 743 9942, P O Box 346, East London, 5200

OTHER BRANCH OFFICES: Cape Town, Kokstad, Johannesburg, Mthatha, Queenstown, Lusaka - Zambia

CLIENT: Delta Built Environmental Consultants

P O Box 35703

MENLO PARK

0102

ATT: Mr P Agema

PROJECT: EAST LONDON AIRPORT

DATE RECEIVED: 218-11-29

DATE TESTED: 2018-12-07

DATE REPORTED: 2018-12-10

TEST REPORT NO.: 93083

CONCRETE CORE STRENGTHS

(SABS METHOD 865 : 1994)

CORE SAMPLE NO.	1	2	3	4	5
POSITION	APRON SLAB BAY 1				
DIRECTION OF DRILLING	VERTICAL				

COMMENT ON VISUAL APPEARANCE						
CORE DATA		Test Parameters				
Max length	(mm)	307	271	293	292	298
Min length	(mm)	261	260	248	262	272
Diameter	(mm)	102	102	102	102	102
Area	(mm ²)	8171	8171	8171	8171	8171
Ground length	(mm)	110	110	110	102	106
Ground length/diameter	(ratio)	0.93	0.93	0.93	1.00	0.96
Volume of Ground Core	(mm ³)	898840	898840	898840	833470	866155
Diameter of Reinforcing Steel	(mm)	N/A	N/A	N/A	N/A	N/A
Distance from Axis of Bar to nearer end of core	(mm)	N/A	N/A	N/A	N/A	N/A
Mass of Core after Grinding	(g)	2153	2171	2129	2123	2072
Density	(Kg/m ³)	2395	2415	2369	2547	2392
Estimated Excess Voids	%	N/A	N/A	N/A	N/A	N/A

Load at Failure	(kN)	402	403	449	427	530
Crushing Strength Before Correction	(MPa)	49.2	49.3	54.9	52.3	64.9

Correction Factors for Excess Voids		1	1	1	1	1
Correction Factors for Reinforcing		N/A	N/A	N/A	N/A	N/A
Correction Factors for length/dia- ratio		1.030	1.030	1.030	1.000	1.015

Corrected Strength	(MPa)	50.7	50.8	56.6	52.3	65.9
--------------------	-------	------	------	------	------	------

Average Strength	(MPa)	55.3
Lowest Individual	(MPa)	50.7

Remarks: Acceptance of concrete on the basis of core strength SANS 0100-2. If the average core strength is at least 80% of the specified strength and if no single core strength is less than 70% of the specified strength, then the concrete shall be accepted

REMARKS: CORING DONE BY CONTROLAB SA (PTY)
EAST LONDON

1- Method of capping, n/a

Everything possible is done to ensure that tests are representative and are performed accurately, and that reports and conclusions are quoted correctly. Controlab or its officials can in no way be held liable for consequential damage or loss due to any error made in carrying out the tests, nor for any erroneous statement or opinion contained in a report based on such tests. If a test report is published or reproduced by the client, it will be done in full, without any omission.

Technical Signatory:

J Atterbury



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OTHER BRANCH OFFICES: Cape Town, Kokstad, Johannesburg, Mthatha, Queenstown, Lusaka - Zambia

CLIENT: Delta Built Environmental Consultants

P O Box 35703

MENLO PARK

0102

ATT: Mr P Agema

PROJECT: EAST LONDON AIRPORT

DATE RECEIVED: 218-11-29

DATE TESTED: 2018-12-07

DATE REPORTED: 2018-12-10

TEST REPORT NO.: 93083

CONCRETE CORE STRENGTHS

(SABS METHOD 865 : 1994)

CORE SAMPLE NO.	6	7				
POSITION	APRON SLAB BAY 5					
DIRECTION OF DRILLING	VERTICAL					

COMMENT ON VISUAL APPEARANCE						
CORE DATA		Test Parameters				
Max length	(mm)	310	308			
Min length	(mm)	304	307			
Diameter	(mm)	102	102			
Area	(mm ²)	8171	8171			
Ground length	(mm)	105	103			
Ground length/diameter	(ratio)	0.97	0.99			
Volume of Ground Core	(mm ³)	857984	841641			
Diameter of Reinforcing Steel	(mm)	N/A	N/A			
Distance from Axis of Bar to nearer end of core	(mm)	N/A	N/A			
Mass of Core after Grinding	(g)	2037	1984			
Density	(Kg/m ³)	2374	2357			
Estimated Excess Voids	%	N/A	N/A			

Load at Failure	(kN)	469	505			
-----------------	------	-----	-----	--	--	--

Crushing Strength Before Correction	(MPa)	57.4	61.8			
-------------------------------------	-------	------	------	--	--	--

Correction Factors for Excess Voids		1	1			
Correction Factors for Reinforcing		N/A	N/A			
Correction Factors for length/dia. ratio		1.012	1.004			

Corrected Strength	(MPa)	58.1	62.0			
--------------------	-------	------	------	--	--	--

Average Strength	(MPa)	60.1	Remarks: Acceptance of concrete on the basis of core strength SANS 0100-2. If the average core strength is at least 80% of the specified strength and if no single core strength is less than 70% of the specified strength, then the concrete shall be accepted.			
Lowest Individual	(MPa)	58.1				

REMARKS: CORING DONE BY CONTROLAB SA (PTY)
EAST LONDON

† Method of capping: n/a

Everything possible is done to ensure that tests are representative and are performed accurately, and that reports and conclusions are quoted correctly. Controlab or its officials can in no way be held liable for consequential damage or loss due to any error made in carrying out the tests, nor for any erroneous statement or opinion contained in a report based on such tests. If a test report is published or reproduced by the client, it will be done in full, without any abridgement.

Technical Signatory:

J Atterbury

TR0020A

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	CLIENT:	Delta Built Environmental Consultants EL	CORE HOLE:	1
	PROJECT:	AIRPORT		
	REF:	93083	DATE:	29-11-2018

CORE HOLE PHOTOGRAPHS

CORE HOLE 1 A

DELTA BEC
EL AIRPORT CONCRETE APRON SLABS
JOB NO.: 93083
CORE 1 A
CRACK PRESENT



CORE HOLE 1 D

DELTA BEC
EL AIRPORT CONCRETE APRON SLABS
JOB NO.: 93083
CORE 1 D (CARBONATION TEST)
CRACK PRESENT



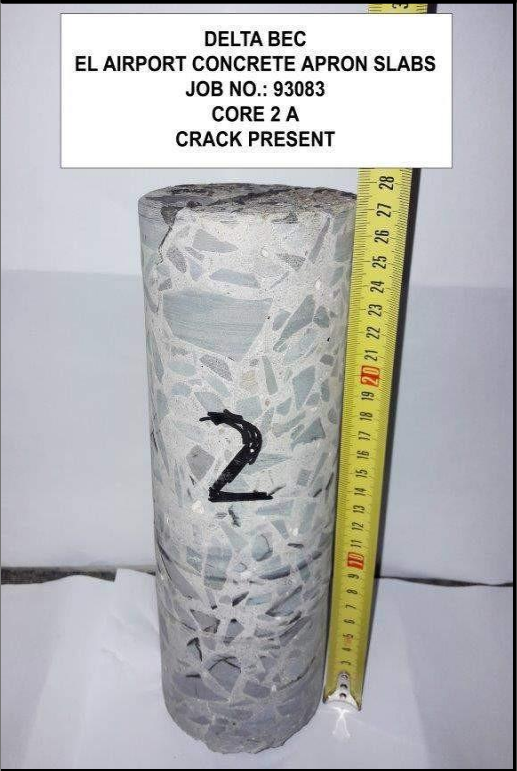
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	CLIENT:	Delta Built Environmental Consultants EL	CORE HOLE:	2
	PROJECT:	AIRPORT		
	REF:	93083	DATE:	29-11-2018

CORE HOLE PHOTOGRAPHS

CORE HOLE 2 A

DELTA BEC
EL AIRPORT CONCRETE APRON SLABS
JOB NO.: 93083
CORE 2 A
CRACK PRESENT

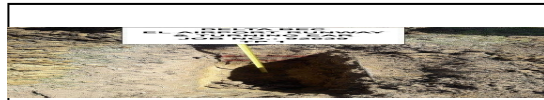


CORE HOLE 2 B

DELTA BEC
EL AIRPORT CONCRETE APRON SLABS
JOB NO.: 93083
CORE 2 D (CARBONATION TEST)
CRACK PRESENT



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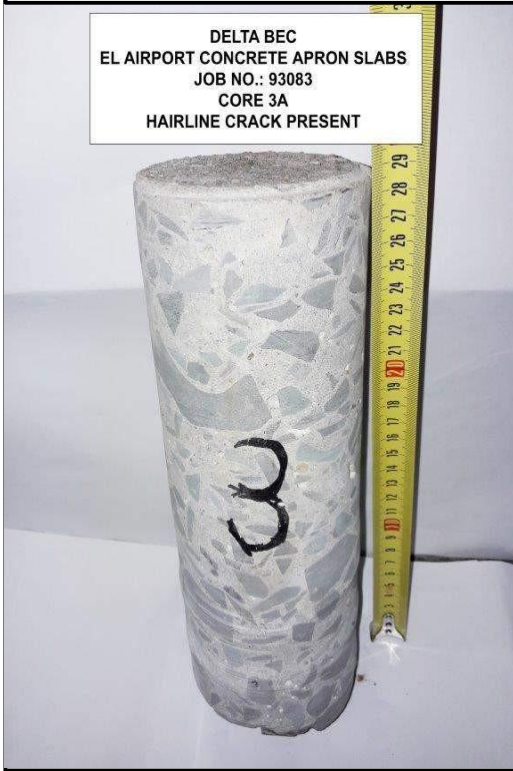
CLIENT: Delta Built Environmental Consultants EL
PROJECT: AIRPORT
REF: 93083

CORE HOLE: 3
DATE: 29-11-2018

CORE HOLE PHOTOGRAPHS

CORE HOLE 3 A

DELTA BEC
EL AIRPORT CONCRETE APRON SLABS
JOB NO.: 93083
CORE 3A
HAIRLINE CRACK PRESENT



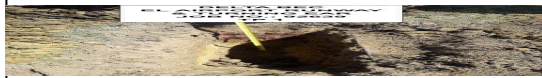
CORE HOLE 3 D

DELTA BEC
EL AIRPORT CONCRETE APRON SLABS
JOB NO.: 93083
CORE 3C (CARBONATION TEST)
HAIRLINE CRACK PRESENT



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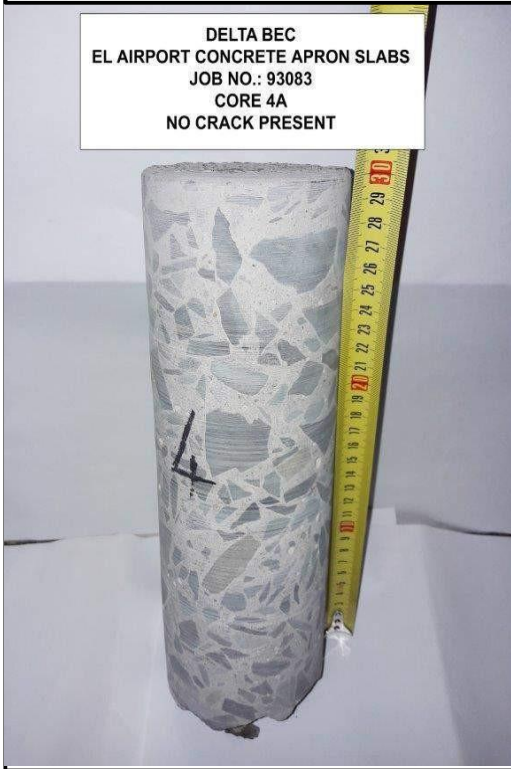
CLIENT: Delta Built Environmental Consultants EL
PROJECT: AIRPORT
REF: 93083

CORE HOLE: 4
DATE: 29-11-2018

CORE HOLE PHOTOGRAPHS

CORE HOLE 4 A

DELTA BEC
EL AIRPORT CONCRETE APRON SLABS
JOB NO.: 93083
CORE 4A
NO CRACK PRESENT

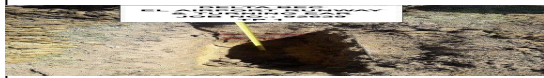


CORE HOLE 4 B

DELTA BEC
EL AIRPORT CONCRETE APRON SLABS
JOB NO.: 93083
CORE 4B (CARBONATION TEST)
NO CRACK PRESENT



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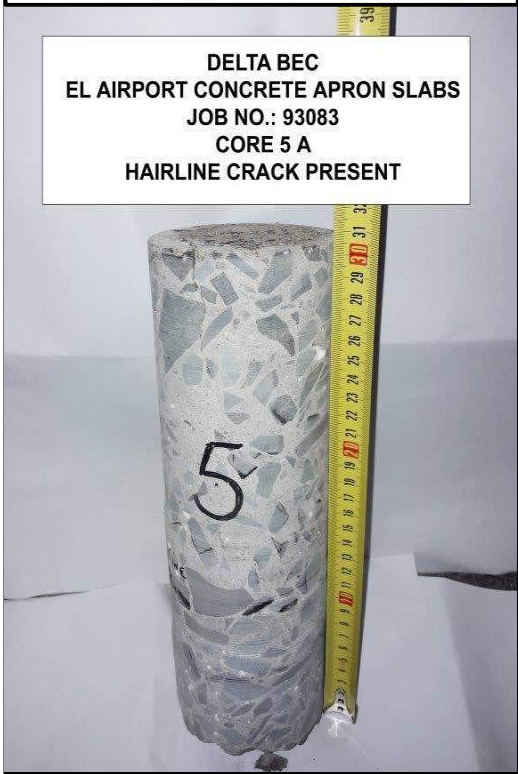
CLIENT: Delta Built Environmental Consultants EL
PROJECT: AIRPORT
REF: 93083

CORE HOLE: 5
DATE: 29-11-2018

CORE HOLE PHOTOGRAPHS

CORE HOLE 5 A

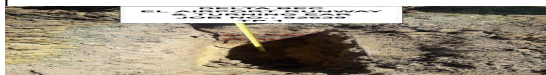
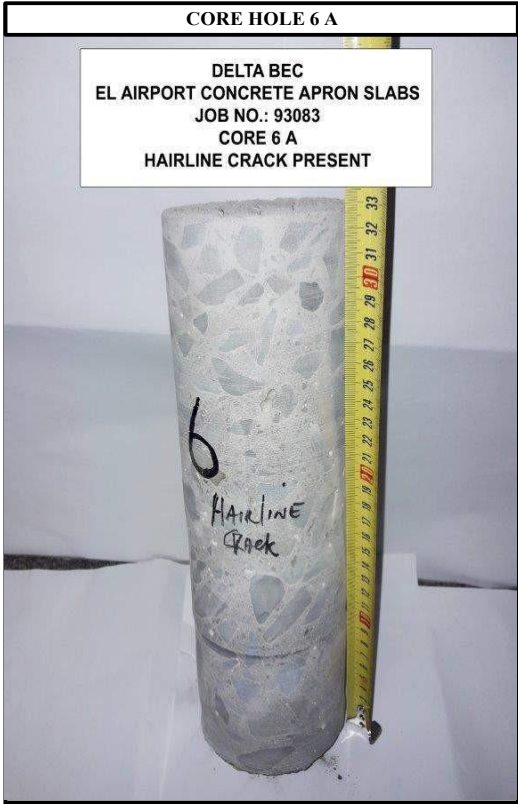

DELTA BEC
EL AIRPORT CONCRETE APRON SLABS
JOB NO.: 93083
CORE 5 A
HAIRLINE CRACK PRESENT

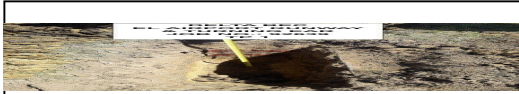


CORE HOLE 5 D

DELTA BEC
EL AIRPORT CONCRETE APRON SLABS
JOB NO.: 93083
CORE 5 D (CARBONATION TEST)
HAIRLINE CRACK PRESENT



	CLIENT: Delta Built Environmental Consultants EL PROJECT: AIRPORT REF: 93083	CORE HOLE: 6 DATE: 29-11-2018
CORE HOLE PHOTOGRAPHS		
<div>CORE HOLE 6 A </div>	<div>CORE HOLE 6 D </div>	

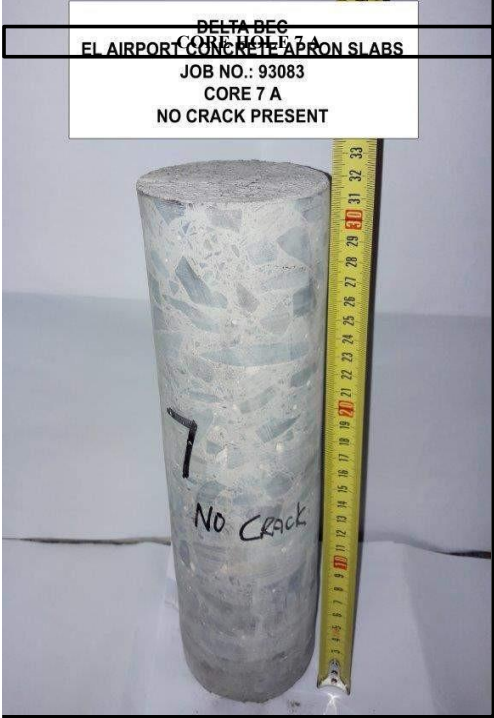


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PROJECT: AIRPORT
REF: 93083

CORE HOLE: 6
DATE: 29-11-2018

CORE HOLE PHOTOGRAPHS

CORE HOLE 7 D



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CLIENT: Delta Built Environmental Consultants EL
PROJECT: AIRPORT
REF: 93083

CORE HOLE: 6
DATE: 29-11-2018

Annexure B

INSURANCE CLAUSES FOR AIRSIDE CONSTRUCTION CONTRACTS WHERE THE AWARDED CONTRACT

VALUE DOES NOT EXCEED R150 MILLION, AND THE CONSTRUCTION PERIOD DOES NOT EXCEED 36

MONTHS, AND THE DEFECTS LIABILITY PERIOD DOES NOT EXCEED 24 MONTHS

Each Party shall be responsible for effecting and maintaining the relevant insurances as specified below and to the extent relevant to the Contract.

1. Insurance Effected By The Employer (Principle Controlled Insurance ("PCI"))

1.1 Notwithstanding anything elsewhere contained in this Contract and without limiting the obligations,

liabilities or responsibilities of the Contractor in anyway whatsoever (including but not limited to any

requirement for the provision by the Contractor of any other insurances) the **Employer** shall effect and maintain for the duration of the construction and maintenance periods of the Contract - as appropriate in the joint names of the Employer, the Contractor and where relevant Sub-Contractors

the following insurances which are subject to the terms, limits, exceptions and conditions of the Policy:

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

Section 1 Of The Policy – Contract Works

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

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

This insurance contains the following limitations and warranties ;

Open Trench Limitation

In respect of loss or damage to open trenches and pipes, conduits or cables laid therein, caused directly or indirectly by rain, inundation or flood, Insurers liability shall be limited in respect of the aggregate length of open trenches at any one time to 2,500 meters.

Exposed Layer Works (applicable to works involving paving, roadways, bulk earthworks and runways and

2

taxiways)

In respect of loss or damage to Exposed Layer Works relating to paving, roadways and runways (including taxiways) caused directly or indirectly by rain, inundation or flood, Insurers liability shall be limited in respect of the aggregate length of Exposed Layer Works at any one time to 2,500 meters.

Section II of the Policy – Contractors Public Liability

Public Liability Insurance which provides indemnity against legal liability in the event of accidental death of or injury to persons and/or loss of or damage to property (other than the Works the subject matter of this Contract) arising from the execution of the Contract with a limit of indemnity of **R100,000,000** in respect of any one occurrence or series of occurrences consequent on or attributable to one source or original cause.

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CLIENT: Delta Built Environmental Consultants EL
PROJECT: AIRPORT
REF: 93083

CORE HOLE: 6
DATE: 29-11-2018

Section III of the Policy – Removal Of Lateral Support Liability

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

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

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

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

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

3

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

c) Aviation Liability Insurance which provides indemnity against legal liability in the event of accidental death of or injury to persons and/or loss of or damage to property (other than the Works the subject matter of this Contract) arising from the execution of the Contract with a limit of indemnity of **R2,000,000,000** in respect of any one occurrence or series of occurrences consequent on or to one source or original cause.

This insurance is in respect of liability relating to aircrafts.

d) Design & Construct Professional Indemnity Insurance which provides indemnity against legal liability to pay compensation as a result of any actual or alleged negligent act, error or omission in the performance of the Professional Duties of the insured and arising from the execution of this project. The limit of indemnity under this insurance shall be ***R25,000,000 in the aggregate during the annual policy period of insurance that ACSA effect such cover during the policy period from 1 April to 31 March during each policy period of insurance.**

**The limits of indemnity applies to all ACSA contracts as a whole and does not apply specifically to this contract. The aggregate limit could be exhausted by claims under other ACSA contracts and there is no guarantee that this insurance cover will provide sufficient cover to this specific contract should the aggregate limit be exhausted.*

The Policy only covers the rectification of the works and excludes all consequential losses.

Professional Duties do not include:

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

1. 2 The **Contractor** shall familiarise itself fully with the details of such insurance effected by the Employer. The Contractor shall comply to all the terms and conditions of the Employer arranged policies and the Contractor shall be deemed to be fully aware of all the conditions, limits, limitations, exclusions/exceptions and deductibles that are contained in the Employer arranged policies. Copies of the Employer arranged policies are obtainable on request from the Employer and

if the Contractor is of the opinion that additional insurance is required, such shall be for the

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CLIENT: Delta Built Environmental Consultants EL
PROJECT: AIRPORT
REF: 93083

CORE HOLE: 6
DATE: 29-11-2018

Contractors account.

4

1.3 The Employer shall pay the premium in connection with the insurances effected by the Employer.

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

1.4 The Contractor shall not include any premium charges for this insurance except to the extent, which

he may deem necessary in his own interests to effect supplementary insurance to the insurance effected by the Employer. The Employer reserves the right to call for full information regarding insurance costs included by the Contractor.

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

1.5 Any further clarification of the scope of cover provided by the Policies arranged by the Employer

should be obtained from the Employer.

1.6 The Contractor and/or any other party who obtains indemnity under the policies effected under

1.1 shall become liable for the deductibles (first amount payable) which are applicable in respect of each and every occurrence or series of occurrences attributable to one source or cause giving rise to loss or damage or indemnifiable liability. The deductibles applicable to the policies effected under 1.1 are as follows:

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

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

Section 1 Of The Policy – Contract Works

In respect of all loss or damage **R150,000** but increased to **R250,000** in respect of loss or damage arising out of or in connection with testing and commissioning.

Section 2 Of The Policy – Contractors Public Liability

R75,000 each and every claim in respect of Property Damage.

5

Section 3 Of The Policy – Removal Of Lateral Support Liability

R75,000 each and every claim.

b) Contract Works SASRIA

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

c) Aviation Liability Insurance ;

In respect of each and every loss or damage or injury – **R300 000.**

d) Design & Construct Professional Indemnity Insurance

a) In respect of contracts under R50 million at award – **R5,000,000.**

b) In respect of contracts over R50 million at award – **R10,000,000**

1.7 In the event of any occurrence which is likely to give rise to a claim under the insurance arranged

by the Employer, the Contractor shall:

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

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CLIENT: Delta Built Environmental Consultants EL
PROJECT: AIRPORT
REF: 93083

CORE HOLE: 6
DATE: 29-11-2018

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

Airports Company South Africa :

Nokulunga Masiza

Tel: +27 (0)11 723 1400

M: +27 (0)79 512 0532

6

Nokulunga.Masiza@airports.co.za

Buhle Mnguni

D: +27 (0)11 723 1400

M: +27 (0)74 535 9075

Buhle.Mnguni@airports.co.za

b) Preserve damage and make it available for inspection by a representative of the Insurers.

c) Wherever possible, photographs of damage should be taken.

d) Inform the police authorities promptly in the event of loss or damage by theft, burglary or any malicious persons(s) for the purpose of recovering any property so lost, discovering the guilty person or persons, and having him, her or them duly prosecuted.

e) Advise the Insurers of any other insurance(s) which may cover the same loss, damage or injury, or any part thereof.

f) Give to the Insurers every assistance to enable the Insurers to settle or resist any claim against the Insured, or institute any proceedings;

g) On completion the Claims Advice Form, the form must be sent to the Employers Insurance Brokers for further action (the original may be emailed to the Employers Insurance Broker). (Please do not remove the Claims Advice Form out of this document. Rather photocopy the form and send the copy to the Employers Insurance Brokers).

h) The Employer and the employers Insurance brokers / Insurers or their appointed loss adjusters shall have the right to make all and any enquiry's on the Site of the Works or elsewhere as to the cause and results of any such occurrence and the Contractor shall cooperate in carrying out such enquiry's.

i) The Contractor, Project Managers and Consultants must allow free access to Insurers' assessors for the purpose of investigating and assessing the loss or damage.

j) The Contractor must not proceed with the making good any off the loss without the prior authorisation of the Insurers.

7

k) The Contractor must keep separate records of the costs involved in making good any loss or damage and these records should be available at all times for inspection by Insurers. Such records should include inter alia the entire cost of labour, materials, transport and equipment.

l) Where required by the Employer, negotiate the settlement of claims with the Insurer or their appointed loss adjusters through the Employer's Insurance Brokers and shall obtain the Employer's approval of such settlement.

m) Once the amount of a claim is agreed by the Insurers and the Contractor, an "Agreement of Loss" form must be signed by the Contractor and if required this shall be counter signed by the Employer or the Project Managers.

n) The proceeds of such claim will, if required by the Employer, be paid net of any Deductible applicable under the policy by the Insurers to the Employer who on receipt thereof will arrange for payment to be made in terms of the Conditions of Contract. In the event that it is agreed by the Employer that such claims payment be made directly to the Contractor, the Contractor shall arrange for the Employer to endorse the "Agreement of Loss" to this effect.

2. Insurance Effected by the Contractor.

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CLIENT: Delta Built Environmental Consultants EL
PROJECT: AIRPORT
REF: 93083

CORE HOLE: 6
DATE: 29-11-2018

In addition to Clause 1.1 in respect of the insurances effected by the Employer the following Insurances to be effected by the Contractor :

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

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

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

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

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

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

8

In the event that a claim is made against the Employer in connection with such insurance, the Contractor shall indemnify and hold harmless the Employer against any such claim.

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

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

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

Should the Contractor believe that the Employer effected Contract Works, Public Liability and Design & Construct Professional Indemnity deductibles as noted in Clause 1.6 (a),(c) and (d) be considered to be unacceptable to the Contractor, then the Contractor must obtain Buy Down cover for these deductibles to a deductible considered by the Contractor as being acceptable in respect of the works being undertaken.

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

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

f) **Public Liability** insurances in excess of the Employers Public Liability insurances as stated under clause 1.1(a).

g) **Aviation Liability** insurances in excess of the Employers Aviation Liability insurances as stated under clause 1.1(c).

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

i) Marine Cargo Insurance (If Applicable)

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

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PROJECT: AIRPORT
REF: 93083

CORE HOLE: 6
DATE: 29-11-2018

constructed.

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

9

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

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

j) Miscellaneous Insurance

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

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

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

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

2.4 Sub-Contractors.

The Contractor shall:

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

10

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

APPENDIX A

CONTRACTORS CLAIMS ADVICE FORM - FOR ACSA INSURED CONTRACTS UNDER THE ANNUAL POLICY

Send to : Airports Company South Africa

11

E-Mail The Following People :

Nokulunga.Masiza@airports.co.za

Buhle.Mnguni@airports.co.za

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CORE HOLE: 6

DATE: 29-11-2018

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

RE :ACSA CONTRACTORS : CAR/PL/PI : CLAIM

Date of loss : _____

Reported to site agent by : _____ Date : _____

Reported to Insurance Broker by : _____ Date : _____

Locality of Incident _____

How did the loss occur (cause) ? _____

Details and nature of loss or damage to Contract Works _____

Details of other property damaged _____

Names and address of witnesses _____

Estimated cost of repairs (Separate records of all costs must be kept) R _____
12

Person whom assessor should contact _____

Telephone/Mobile Numbers Of Contact Person _____

Email Address of Contact Person _____

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