



SCOPE OF WORKS

Project Description

Surface rehabilitation and level correction of Quebec and resurfacing and base repairs of 21R at the threshold (see below extent of works marked in blue box in figure 1).



Figure 1: Quebec taxiway and 21R threshold

Scope of works

Works will be based on COLTO standard specifications for road & bridge works for South African Road Authorities (chapter 1.2 ,1.3, 1.5, 4.3, 9.1, 11.7, 11.9 and 20.1)

- General requirements & provisions
- Contractor's establishment onsite & general obligations
- Accommodation of traffic
- Existing road materials
- Asphalt layers & Electrical works for AGLs (aircraft ground lights)
- Road markings and road studs
- Finishing the road and road reserve and treating old roads
- Testing materials and judgement of workmanship

The activities will consist of the following:

- Milling 120mm of the asphalt layer on the affected Quebec taxiway (include level correction) and 21R threshold.
- Replace with 40mm PG64H-16(PMB) surfacing (full area) and 80mm PG64H-16(PMB) base (full area)
- Implement polypropylene non-woven asphalt reinforcing
- Reinstating line markings

Contractors Requirements

- i) Compilation and submission for approval of a detailed site safety plan and work method statements, all in compliance with the Manual for Working Airside – Volume 5.
- ii) Attendance by all site staff of a safety training course and obtaining ACSA permits. This includes the necessary vehicle and equipment driving permits for any driver having to drive airside, as indicated in the Manual for Working Airside – Volume 5.
- iii) Compile and submit a quality management plan for approval by the Employer's Agent.
- iv) Compliance with local and national Occupational Health and Safety regulations (OHS Act No. 85 of 1993) and ACSA Health and Safety regulations.
- v) Full compliance with the ACSA Environmental Specifications.
- vi) Establishment on site of the camp, 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.

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. All works will be night shift and the work areas will be available at the following time periods:

- Taxiway Quebec and 21R Threshold From 00h30 to 05h00

(a) 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 taxiways.

All lights on the taxiways affected by the remedial pavement works will need to be removed and replaced during the same shift.

Provision is made to install sleeves or to re-slot damaged and old cables next to the existing cables into the existing runways. This activity will be done before any rehabilitation works commence to limit the amount of joints on the final surfacing.

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.

TEMPORARY WORKS

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

- (a) Where applicable (in limited occupation areas), transverse and longitudinal ramps at the end of each shift during construction of the asphalt overlays on the runways and taxiways. The details for the construction and removal of these ramps are discussed in the project specification.
- (b) Signage and markings for the surface movement of aircraft and vehicles.
- (c) Placing and removal of barricades where required.
- (d) All facilities within the Contractor's construction camp. The design shall comply with the specifications where provided in these documents and all statutory requirements such as the Occupational Health and Safety Act and Regulations. The area is to be reinstated upon completion.
- (e) Access roads for the construction camp and temporary material stockpile site. These roads are to be designed, constructed and maintained by the Contractor to comply with safety and environmental requirements. They must be reinstated upon completion the Works.

HEALTH AND SAFETY

- **Health and Safety Requirements and Procedures**

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

- **Barricades and lighting**

Requirements for the provision and usage of barricades and lighting are stated in Volume 5 and Sections A1.3 and A1.5 of the Specifications.

- **Traffic Control**

Safety requirements and procedures where the Contractor has occupation of taxiways, runways or roads are stated in **Volume 5** and **Section A1.5 of the Specification**.

SPECIAL ITEMS AS PER THE PRICING SCHEDULE

SECTION 1.3: CONTRACTOR'S SITE ESTABLISHMENT AND GENERAL OBLIGATIONS

PART C: MEASUREMENT AND PAYMENT

Item	Unit
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C1.3.1 The Contractor's general obligations

Delete subitem C1.3.1.3 and replace with the following:

“C1.3.1.3	Time related obligations: b) Execution of the works	month”
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Add the following payment items

“C1.3.1.6	Control of dust and FOD pollution at all work areas including haul and site access roads and campsite/site offices.....	Lump sum”
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“C1.3.1.7	Airside induction courses and permits.....	Lump sum”
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Add the following payment item

C1.3.3	Provision of site supervisory staff.....	Prov sum”
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Under the heading “Item C1.3.1.3”, delete the 2nd paragraph and replace with the following:

“The contract rate shall include full compensation for that part of the Contractor's general obligations which are mainly a function of construction time. The contract rate shall be deemed to include, leasing costs, hire costs or cost of ownership per month for Contractor's Equipment. The contract rate will be paid monthly, pro rata for parts of a month, from the Commencement Date in terms of the Contract Documentation. For item C1.3.1.3(b) the contract rate will be paid monthly, pro rata for parts of a month, from the end of Mobilisation Period until the end of the original Contract Period specified for completion of the Works.”

Add the following new paragraphs:

“Item C1.3.1.6

The tendered lump sum shall represent full compensation for all costs incurred control of dust and FOD pollution at all work areas including haul and site access roads and campsite/site offices. No additional payment will be made for the control of FOD on the project.

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

- (1) The first instalment, 70% of the lump sum, will be made in the first payment certificate after the Contractor has made a substantial start with construction in accordance with the approved programme.
- (2) The second instalment, 30% of the lump sum, will be paid when the value of the work reaches one half of the tendered amount, excluding contingencies and price adjustments.”

“Item C1.3.1.7

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

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

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

- (1) The first instalment, 70% of the lump sum, will be made in the first payment certificate after the Contractor has made a substantial start with construction in accordance with the approved programme.
- (2) The second instalment, 30% of the lump sum, will be paid when the value of the work reaches one half of the tendered amount, excluding contingencies and price adjustments.”

“Item C1.3.1.8

The rate shown reflect the amount which shall apply for penalty to be deducted for non-compliance with requirements for accommodation of traffic as set out in A1.2.3.25, A1.5 and Volume 5. These rates are per occurrence and shall be applied if deemed necessary by the Engineer. “

“Item C1.3.3

The provisional sum allowed for shall be for the direct cost in paying salaries of the supervisory staff on the project provided by the Engineer. All contracts and employment related costs shall be covered by the Engineer.”

SECTION 1.4: FACILITIES FOR THE ENGINEER**PART C: MEASUREMENT AND PAYMENT**

Add the following payment subitems

Item	Unit
C1.4.7 Site inspection transport	
“C1.4.7.3 The provision of site vehicle for Engineer's site staff.....	Prime cost sum (PC)
C1.4.7.4 Handling costs and profit in respect of item C1.4.7.3.....	Percentage (%)

Add the following paragraphs:

“Item C1.4.7.3

The prime cost sum shall be for the direct cost to provide a vehicle for the Engineers site staff. The vehicle shall comply to all ACSA regulations and shall be sourced by the Engineer.”

“Item C1.4.7.4

The percentage under item C1.4.7.4 is a percentage of the amount spent under item C1.4.7.3 which shall include full compensation for all handling costs, profit and all other charges in connection with arranging and carrying out the maintenance works. “

SECTION 1.5: ACCOMMODATION OF TRAFFIC

PART A: SPECIFICATIONS

A1.5.3 GENERAL

Add the following to clause:

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 A1.2.3.25 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 A1.2.3.26).

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.

Upon request by the Engineer or his representative, the Contractor shall make available a mobile flood light tower for use by the Engineer's staff. Payment for this request shall be made under item C1.5.15 "

PART C: MEASUREMENT AND PAYMENT

Add the following payment items:

"The Contractor's obligation under this Section 1.5 shall not be measured or paid for directly (except as hereinafter provided for) and compensation for the work involved to comply with these obligations shall be deemed to be covered by the rates and amounts tendered for the various items of work included under this contract.

Amend the following payment items C1.5.2 and C1.5.3 to the following:

Item	Unit
C1.5.2 Accommodation of airside traffic	month

Add the following paragraph:

The rate shall also include liaising with the Air Traffic Control (ATC) to coordinate all construction related activities.

Add the following payment item::

Item	Unit
C1.5.13 Safety Barriers:	
C1.5.13.1 Provide Taxiway/Runway closure barriers as per drawing complete.....	Number (No)
C1.5.13.2 Placing, moving and final removal of taxiway/runway closure barriers upon completion of the works	Lump Sum

Item Unit

Add the following payment item::

C1.5.14	Provision of lighting on site for works areas during night work or where instructed	Lump sum"
C1.5.15	Traffic Safety Officer	Month
C1.5.16	Provision of escort services for all project vehicles.....	Lump Sum

Item C1.5.13

The Contractor shall be responsible for maintaining the barriers (including ballast of plastic barriers) and lights. Placing and removal of barriers will be measured once only for payment for each barrier. No additional payment will be made for the intermediate moving and placing of barriers during the contract.

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

- (1) The first instalment, 30% of the lump sum, will be made after the contractor has made the initial provision and first placement with the first facility closure
- (2) The second instalment, 40% of the lump sum, will be paid when the value of the work reaches one half of the tendered amount, excluding contingencies and price adjustments.
- (3) The third and final instalment, 30% of the lump sum, will be paid when the barriers are no longer needed and have final been removed off-site."

Item C1.5.14

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 C1.5.15

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 as defined in terms of A1.5.7.12 and A1.2.3.25 (f).

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 C1.5.16

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

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

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

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

COTO CHAPTER 9: ASPHALT LAYERS**SECTION 9.1: ASPHALT LAYERS****PART A: SPECIFICATION****A9.1.5 MATERIALS**

Add the following

A9.1.5.8 Mix properties

Add the following:

"The Immersion Index of a mixture of the binder and aggregate proposed for use shall not be less than 84%.

The maximum rutting shall be 2 mm at 100 000 repetitions using the Model Mobile Load Simulator (MMLS) Wheel tracking test. The test is applicable only to mixes made with modified binder and shall be done according to the Specialised Road Technologies method specification. The tests shall be done on the working mix using three different binder contents, namely the estimated Optimum Binder Content (OBC) and 0.5 % higher and lower than this OBC.

The percentage voids shall be minimum 2% at N_{final} (300 gyrations) using the Superpave Gyratory Test. The test shall be done according to the SHRP testing protocol and shall be done at three binder contents."

PART C: MEASUREMENT AND PAYMENT

Add the following payment subitems

Item	Unit
C9.1.17 Electrical works	
"C9.1.17.1 Removal of taxiway Lights.....	number (No.)
C9.1.17.2 Re-instate taxiway Lights.....	number (No.)

Add the following paragraphs:

Payment item 9.1.17.1 will be the number of full taxiway lights removed and stored in full.

Payment item 9.1.17.2 will be the number of full taxiway sourced and installed according to ICAO and ACSA standards.

COTO CHAPTER 11: ANCILLARY ROAD WORKS**SECTION 11.9: FINISHING THE ROAD AND ROAD RESERVE AND TREATING OLD ROADS****PART C: MEASUREMENT AND PAYMENT***Add the following payment item*

Item	Unit
C11.9.1.3 (a) Taxiway Lima	Lump Sum
C11.9.1.3 (b) 21R Threshold	Lump Sum

COTO CHAPTER 20: QUALITY ASSURANCE

SECTION 20.1: TESTING MATERIALS AND JUDGEMENT OF WORKMANSHIP

PART A: SPECIFICATION

A20.1.2 DEFINITIONS

Independent site laboratory

In the definition of “Independent site laboratory”, add the following:

“Independent Site laboratory in COTO is equivalent to the combined laboratory in the Employer documentation”

A20.1.4 PUBLISHED TEST METHODS

A20.1.4.8 Testing of asphalt

Add the following new paragraph:

“Sabita Manual 39: Laboratory Testing Protocols for Binders and Asphalt, shall be implemented together with the asphalt tests listed.”

Delete reference to: “Sabita Manual 35 for Design and Use of Asphalt in Road Pavements: Determining the Richness Modulus of EME asphalt mixes.”
and replace with “Sabita Manual 33 for Design Procedure for High Modulus Asphalt (EME): Determining the Richness Modulus of EME asphalt mixes.”

A20.1.7 ACCEPTANCE CONTROL BY STATISTICAL JUDGEMENT PRINCIPLES

A20.1.7.2 Taking samples

a) Stratified random sampling

Add the following new paragraph:

“Where the SARDS Laboratory module is used, the sampling locations must be as per the software. The Engineer may specify additional sampling locations.”

b) Minimum samples per lot

Add the following new paragraph:

“Where the SARDS Laboratory module is used, the number of samples per lot must be as per the software, as a minimum. The Engineer may specify additional numbers of samples. The Number of samples must be sufficient to meet the requirements of TMH5.”

A20.1.7.5 Assessment Methods

b) Judgement plans

Add the following new sub-clause (iii) and renumber the existing sub-clause (iii) to (iv) and (iv) to (v):

“(iii) Judgement Plan C

Judgement Plan C is for judging measurements of the levels and thicknesses of pavement layers. In accordance with this plan, the compliance of the individual results only with the specified requirements is determined and the variability of test results is not computed.”

Add the following new sub-clause (e):

“(e) Application of Judgement Plan C

Surface levels and layer thicknesses shall be judged in accordance with the following procedure:

(i) Taking the levels

Level measurements shall be taken in a random pattern, before and after a layer has been constructed, and levels shall be taken at exactly the same point before and after construction. Layer thicknesses will then be determinable as the difference between the pre- and post-construction levels but may be supplemented by determinations made by means of holes made in the layer.

The number of measurements of layer thicknesses shall be at least 30 (thirty), and that of surface levels at least 50 (fifty). Larger sample sizes will give more reliable results.

In the case of asphalt layers, the engineer may require that layer thicknesses be determined only by means of measurements taken on drilled cores, in which case the minimum number of cores shall be 20 (twenty) per lot and not 30 (thirty).

For rehabilitation or repair work the number of measurements shall be as specified in the Contract documentation or as directed by the engineer.

(ii) Calculating the deviations

Compute the difference between the specified level or thickness and the actual level or thickness. Compute the mean thickness of the layer.

(iii) Identifying outliers

Check this work by remeasuring any results which may possibly be defective.

(iv) Assessing the results

The following criteria will apply when results are assessed:

1. Surface levels

The lot will comply with the requirements specified for surface levels if at least 90% of all surface levels are within the H_{90} tolerance specified in each case, before any level corrections are made.

Individual spots, where the surface level deviates by more than the H_{\max} tolerance,

specified in each case, shall be repaired to bring them to within the H_{90} tolerance.

2. Layer thickness

Individual spots, where the actual thickness is less than the specified thickness minus the D_{\max} tolerance specified in each case, shall be locally repaired to bring them within the D_{90} tolerance.”

PART C: MEASUREMENT AND PAYMENT

C20.1.5 Financial contribution for an independent site laboratory

Delete reference to: “/commercial”.