

SCOPE OF WORK FOR ROAD MARKING

In brief, the contractor shall be responsible for the maintenance of both airside and landside road markings at OR Tambo International Airport as and when required. The objective is to maintain the serviceability of the road markings in a sustainable manner at the lowest operating and maintenance cost while ensuring compliance to general safety and aviation related regulation.

The nature of the contract is as follows:

- The Service Managers expectation is for the contractor to always be available for emergency road marking works as and when needed.
- Work will only take place when needed and upon instruction by the Service Manager.
- It is expected that the contractor makes prior arrangements with material suppliers so that painting material is made available as and when needed, including during weekends and after hours.
- It is a condition of this contract that the employer reserves the right to limit the total expenditure on the works. The scope of works may be reduced at any time before or during the contract period.

The scope of works will include re-painting of fading road markings on the runways, taxiways, taxi lanes, aprons, service roads as well as landside roads and open parking bays using retro reflective road marking paint. It will also include blacking out of incorrect markings that are no longer in use.

Precautionary measures shall be put in place when carrying out painting near or around the AGL (Airfield ground lighting). When maintenance work is undertaken, AGL shall always be covered to avoid overspray. Any affected light which has been over sprayed during painting shall be cleaned by the person who is carrying out maintenance work on the aerodrome markings. A quality inspection shall be carried out by the Maintenance Engineering Department or delegated Maintenance Engineering personnel before returning the area back to Fire and Rescue Department.

The Maintenance Engineering Department or delegated Maintenance Engineering personnel shall ensure compliance to the as-built drawings and all applicable as standards as indicated herein.

Following completion of maintenance work of aerodrome markings, a quality inspection shall be carried out by Maintenance Engineering Department or delegated Maintenance Engineering personnel to ensure that the infrastructure is handed over for operational purposes.

The Manager: Civil Maintenance: Maintenance or designated Company Maintenance Engineering personnel shall ensure that monthly audits are completed on the work undertaken by the Approved Contractor using the Contractor Compliance and Quality Assurance Audit – ME 031.

When carrying out work on aerodrome markings, the following regulatory standards shall apply:

- ACI Apron Markings and Signs Handbook
- ICAO Annexure 14 Volume 1: Aerodrome Design and Operations
- ICAO Airport Services Manual - Part 9 Airport Maintenance Practices
- SANS 731 - Part 1 & 2 - Paint markings
- SARTSM

Compliance with all pertinent occupational health and safety regulations, environmental standards, industry norms, and applicable legislation is mandatory for all work. Additionally, strict adherence to airport-specific requirements is required.

No aerodrome markings maintenance work is allowed when fog, bad weather or LVP (low visibility procedure) is experienced.

Material specification:

The material specifications are the required specifications for the materials as placed and/or processed in their final position within the road reserve. It is the Contractor's responsibility to ensure that the materials delivered to the road shall meet these specified requirements.

A11.7.5.2 Materials

Marking materials:

The Contractor is responsible for selecting the appropriate road marking materials for road markings to ensure conformance with this specification's requirements. The road marking materials shall provide the characteristics for retro-reflectivity, luminance, skid resistance and durability as required in the material specifications.

Where thermoplastic, also known as hot melt plastic, or Methyl Methacrylate (MMA), also known as cold plastic, is used, the Contractor shall obtain approved certification, from the manufacturer, that the product complies with the specification and submit this certification to the Engineer.

(i) Road marking paint (solvent borne and water borne)

- Road marking paint shall be Type 1 as specified in SANS 731-1 for solvent borne paints and SANS 731-2 for water borne paints. Only paint, manufactured in a SANS approved and accredited facility shall be accepted. The no-pick-up time of road marking paint shall comply with the Class 1 requirement in accordance with SANS 731-1 and -2.
- The paint shall be delivered at the site in sealed containers marked in accordance with the requirements of SANS 731-1 and -2.
- The viscosity of the paint shall be such that it can be applied according to the manufacturer's recommended guidelines for optimum performance.

(ii) Retro-reflective Road marking

- Retro-reflective Road marking paint shall comply with the requirements of road marking paint in A11.7.5.2a)(i) above with retro reflective drop on beads complying with SANS 51423. Unless otherwise specified by the Engineer or in the Contract Documents, the Contractor may select either solvent or water borne paint.
- Determination of coefficient of retro-reflected luminance by means of portable retro-reflectometer shall be carried out using SANS 6261.

A11.7.6 CONSTRUCTION EQUIPMENT

The Contractor shall submit his plant and equipment list for applying, installing or removal of road marking and road studs as part of his method statement to perform the different elements of the Works.

A11.7.6.1 Mechanical equipment for painting

The equipment shall consist of an apparatus for cleaning the road surfaces, a mechanical road-painting machine, sandblasting equipment and all additional hand-operated and other equipment necessary for completing the work. The mechanical road marking machine shall be capable of painting at least three lines simultaneously and shall apply the paint to a uniform film thickness at the rates of application specified hereinafter.

The road-painting machine shall be so designed that it will be capable of consistently painting the road markings to a uniform width with edges and position within the tolerances specified hereinafter,

without the paint running or splashing or spattering, and applying the glass beads simultaneously with painting. The machine shall further be capable of painting lines of different widths by adjusting the spray jets on the machine or by means of additional equipment attached to the machine.

The road marking machine shall be fitted with a device to guide the operator to the centre of the line to be painted. This device shall be used at all times of operation.

The machine shall be capable of spraying at a speed of more than 5,0 km/h and shall be provided with clearly visible amber warning flashing lights, which shall always be in operation when the machine is on the road. The machine shall always be operated in the same direction as the traffic flow when applying lane markings under traffic.

A11.7.7.7 Weather limitations

Road marking or road studs shall not be applied to a damp road surface or at temperatures lower than 10°C or when in the opinion of the Engineer, the wind strength is such that it may adversely affect the painting operations.

A11.7.7.8 General

In broken lines the length of segments and the gap between segments shall be as indicated on the drawings. If these lengths are altered by the Engineer, the ratio of the lengths of the painted section to the length of the gap between painted sections shall remain the same. Lines shall not be painted more than 3 months prior to the road being opened to public traffic. Where there are risks of previously applied lines wearing through thin surfacing such as slurries, the new lines shall be applied to match the old lines accurately.

Lines on curves, whether broken or unbroken, shall not consist of chords but shall follow the correct radius. Particularly on curves in the road, and where roads are widened such as at climbing or passing lanes, the lines shall form continuous single curves without kinks.

The Contractor shall provide a warranty for the road marking, as specified in the Contract Documentation.

Where indicated by the Engineer, the Contractor shall remove existing painted markings from the existing surfaces by means of sand blasting or as specified by the Engineer. Suitable precautions shall be taken to avoid damage to nearby vehicles or other property during the sand blasting process. The use of black paint or chemical paint remover to obliterate existing markings will not be permitted, except where it is specified by the Engineer as a temporary measure. Where black paint is used, it shall be matt.

A11.7.8.1 Faulty workmanship or materials

If any material which does not comply with the requirements is delivered to the site, or is used in the works, or if any work of an unacceptable quality is carried out, such material or work shall be removed, replaced or repaired as specified by the Engineer at the Contractor's own cost. Rejected road studs, road markings and paint which has been splashed or dripped onto the pavement, kerbs, structures or other such surfaces, shall be removed by the Contractor at his own cost, in an approved manner so that the markings or spilt paint will not show up at all.

The Contractor shall determine the required frequency of testing and conduct sufficient tests on the sourced material for each type of material, to ensure that the quality of work produced will meet the specified requirements for the particular purpose for which it will be used.

A copy of the process control test results shall be submitted to the Engineer for comments.

To monitor the application of paint film thickness and application of glass beads the following control mechanisms shall be employed for all non-performance-based road marking:

- At the start of this work, all paint and bead containers shall be recorded and marked together by the Contractor and Engineer and on completion of the work, all empty containers shall again be recorded, which measures shall be used for calculating the application rates.
- At regular intervals, plates shall be placed in the line of marking and be painted over to

calculate the paint thickness and bead application.

- On extended sections of road marking, the spray machines shall be dipped for volume determination at the start and end or each run, as well as recording the start and end measures of beads. In addition, a discrete marking shall be made at each start and end position to determine the area painted.

- A comprehensive record shall be kept of all the measurements and submitted to the Engineer daily.

Property and/or road marking or studs damaged by the Contractor, his personnel, his agents or sub-Contractors shall be repaired or restored to their condition prior to the damage at the Contractor's expense.

A11.7.8.2 Tolerances

Temporary road marking is generally non removable on final road surfaces and may be over-painted with final road marking of the specified type, which requires their positioning and spacing to be sufficiently accurate to allow over-painting to meet the required tolerances.

Road markings shall be constructed to accuracy within the tolerances given below:

a) Width

The width of lines and other markings shall not be less than the specified width, nor shall they exceed the specified width by more than 10 mm.

b) Position

The position of lines, letters, figures, arrows, retro-reflective road studs and other markings shall not deviate from the true position by more than 100 mm in the longitudinal and 20 mm in the transverse direction.

c) Alignment of markings

The alignment of the edges of longitudinal lines shall not deviate from the true alignment by more than 10 mm in 15 m.

When an unbroken line and a broken line are painted alongside each other, the beginning and the end of the unbroken line shall coincide with the beginning of one broken line and the end of another broken line. When existing lines are repainted, the new markings shall not deviate more than 100 mm in the longitudinal direction nor 10 mm in the transverse direction from the existing marking.

The alignment of the road studs shall not deviate from the true alignment by more than 10 mm and shall be positioned so that the reflective faces are within 5° of a right angle to the centre line of the road

d) Broken lines

The length of segments of broken longitudinal lines shall not deviate by more than 150 mm from the specified length.

e) Testing of plant and equipment

Before applying any final road markings, the Contractor shall satisfy himself and the Engineer, by painting test lines on a section of pavement other than the section required to be marked:
that the painting machine is in good working order and properly adjusted.

that the operator is fully experienced; and

that the machine sprays at the specified rate of paint application.

The Contractor shall bear the cost of all materials and workmanship required for the above plant tests.

In addition, the Contractor shall conduct random paint thickness tests and dip/spread tests as specified by the Engineer.

While work is in progress, tests shall be carried out on materials and/or the quality of work to ensure compliance with the specified requirements. The sampling methods are specified in SANS 731-1. The sampling methods described in TMH5 shall be followed where applicable.

Below is for schedule A on the BOQ

1. Submission & approval of Health and Safety file

.....**Lump Sum**

The service provider must meet all his/her obligations in respect of the Occupational Health and Safety Act and the Construction Regulations and must submit his Health and Safety File to the client's satisfaction. All checklists and templates pertaining safety file document will be provided to the contractor. The service provider must factor costs for safety audits in the rates to comply with OHS Act. The service provider should have the safety representative onsite when the works are taking place. Full payment for this item will be paid to the service provider during the first claim. Contractor shall submit OHS related compliance required document during the contract period submit within 24 hours period.

2. Compliance with obtaining airside

permits.....Prov Sum

The service provider shall note that they must apply for and obtain the required airside permits for all persons, equipment, and vehicles to be utilized during the road marking works on airside. The contractor must invoice permit expenses at cost.

3. Site Establishment

.....**Lump Sum**

The service provider shall note that this is a once off lump sum for obtaining all equipment, tools, vehicles, vehicles branding, etc. to comply with the contract requirements.

4. Work not covered in the BOQ (Contingency)

.....**Prov sum**

This is a provision for works not specifically covered elsewhere in the BOQ.

Below is for schedule B on the BOQ

1. Temporary traffic-control facilities

.....**man-day, No**

The service provider will claim for these items according to the tendered rates if it is required during the maintenance works.

- a) Flagmen
- b) Warning signs

2. Provision of lighting on site to work on areas during night work

.....**lump sum**

The tendered lump sum shall include full compensation for lighting equipment and labour.

Below is for schedule C on the BOQ

Water based road marking paint on runways

The service provider will undertake the restoration of runway centrelines, lettering, and symbols by painting them in their original positions. Compensation for this task will be processed monthly based on the tendered rates, exclusively for completed work necessitated during that period.

C11.7.1.1	White lines broken or unbroken (paint type and width of line indicated)	.....kilometre (km)
C11.7.1.4	White lettering and symbols (paint type indicated)	.....square metre (m ²)
C11.7.1.5	Yellow lettering and symbols (paint type indicated)	.....square metre (m ²)

Retro-reflective Road marking paint on taxiways

The service provider will conduct the painting of taxiway markings with precision, ensuring clarity and visibility. Compensation for this task will be remunerated monthly at the tendered rates, contingent upon completion of the necessary painting works during that timeframe.

C11.7.2.1	White lines broken or unbroken (paint type and width of line indicated)	.....kilometre (km)
C11.7.2.4	White lettering and symbols (paint type indicated)	.....square metre (m ²)
C11.7.2.6	Red lettering and symbols (paint type indicated)	.....square metre (m ²)
C11.7.2.7	Transverse lines, painted island and arrestor bed markings (any colour) (paint type indicated) (JETBLAST)	.....square metre (m ²)

Retro-reflective Road marking paint on Aprons

The service provider will execute the painting of apron markings meticulously, guaranteeing optimal visibility and adherence to standards. Compensation for this task will be disbursed monthly, in accordance with the tendered rates, upon completion of the requisite painting activities within the designated period.

C11.7.2.1	White lines broken or unbroken (paint type and width of line indicated)	.....kilometre (km)
C11.7.2.2	Yellow lines broken or unbroken (paint type and width of line indicated)	.....kilometre (km)
C11.7.2.3	Red lines broken or unbroken (paint type and width of line indicated)	.....kilometre (km)
C11.7.2.5	Yellow lettering and symbols (paint type indicated)	.....square metre (m ²)
C11.7.2.7	Transverse lines, painted island and arrestor bed markings (any colour) (paint type indicated)	.....square metre (m ²)
Black lines	.....kilometre (km)	
Black lettering	.....square metre (m ²)	

Retro-reflective Road marking paint on Service roads

The service provider will undertake the painting of service roads and taxi lanes with meticulous

attention to detail, ensuring clear delineation and visibility. Compensation for this service will be processed monthly at the tendered rates, contingent upon the completion of painting works required within the specified timeframe.

C11.7.2.1 White lines broken or unbroken (paint type and width of line indicated)	.....kilometre (km)
C11.7.2.2 Yellow lines broken or unbroken (paint type and width of line indicated)	.....kilometre (km)
C11.7.2.3 Red lines broken or unbroken (paint type and width of line indicated)	.....kilometre (km)
C11.7.2.4 White lettering and symbols (paint type indicated)	.....square metre (m ²)
C11.7.2.5 Yellow lettering and symbols (paint type indicated)	.....square metre (m ²)
C11.7.2.6 Red lettering and symbols (paint type indicated)	.....square metre (m ²)

Removal of existing, temporary/permanent road markings by blacking out

The service provider will meticulously black out existing road markings on both landside and airside areas, ensuring thorough coverage and adherence to safety standards. Compensation for this task will be processed monthly at the tendered rates, upon successful completion of the blacking out process within the designated period.

C11.7.10.3 Overpainting as temporary measuresquare metre (m ²)
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Variations in rate of application

The service provider will apply high-quality reflective glass beads for road marking pain in required areas as specified.

C11.7.5.4 Retro-reflective beadskilogram (kg)
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Below is for schedule D on the BOQ

Retro-reflective Road marking paint on the landside road network

The service provider will undertake the restoration of the landside road marking that include centrelines, lettering, and symbols by painting them in their original positions. Compensation for this task will be processed monthly based on the tendered rates, exclusively for completed work necessitated during that period.

C11.7.2.1 White lines broken or unbroken (paint type and width of line indicated)	.....kilometre (km)
C11.7.2.2 Yellow lines broken or unbroken (paint type and width of line indicated)	.....kilometre (km)
C11.7.2.3 Red lines broken or unbroken (paint type and width of line indicated)	.....kilometre (km)
C11.7.2.4 White lettering and symbols (paint type indicated)	.....kilometre (km)

.....	.....square metre (m2)
C11.7.2.6 Red lettering and symbols (paint type indicated)	.....square metre (m2)
.....	.....square metre (m2)
C11.7.2.7 Transverse lines, painted island and arrestor bed markings (any colour) (paint type indicated)	.....square metre (m2)

Removal of existing, temporary/permanent road markings by blacking out

The service provider will meticulously black out existing road markings on both landside areas, ensuring thorough coverage and adherence to safety standards. Compensation for this task will be processed monthly at the tendered rates, upon successful completion of the blacking out process within the designated period.

C11.7.10.3 Overpainting as temporary measure

.....square metre (m2)

Variations in rate of application

The service provider will apply high-quality reflective glass beads for road marking pain in required areas as required.

C11.7.5.4 Retro-reflective beads

.....kilogram (kg)