ELECTRICAL ENGINEERING

MEGCHEM

FUNCTIONAL SPECIFICATION

Airports Company South Africa (ACSA)

20" Jet Fuel Feeder Line Replacement

Date	**:**	21 October 2024
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Revision	**:**	B

REVISION HISTORY

Revision	Date	Description
A	2024-10-17	Issued for Internal Review
B	2024-10-21	Issued for Budget Costing

ACCEPTANCE

	NAME	DESIGNATION	SIGNATURE
COMPILED	D. Cafun	Megchem	Delano Cafun Digitally signed by Delano Cafun Date: 2024.10.21 15:37:28 +02'00'
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1 INTRODUCTION

The purpose of the project is to design and construct a new underground 20" Jet Fuel Hydrant Feeder Line from the Fuel Depot to the existing valve chamber VCM1. VCM1 distributes jet fuel to the respective aprons at OR Tambo International Airport (ORTIA). The new 20" Jet Fuel Hydrant Feeder Line will replace the existing 20" Jet Fuel Hydrant Feeder Line which has been decommissioned since 2016. There is currently an in-service 18" Jet Fuel Hydrant Feeder Line, which at certain points of its route runs parallel to the decommissioned 20" Jet Fuel Hydrant Feeder Line. The current 18" Jet Fuel Hydrant Feeder Line runs from the Fuel Depot to an existing valve chamber VCM2, which then distributes jet fuel to the respective aprons at OR Tambo International Airport (ORTIA).

The purpose of this document is to provide the necessary information for the design, supply, and installation of cathodic protection to protect the Feeder Line against corrosion.

2 REGULATORY STANDARDS

The design, supply, installation and material used shall conform to the listed statutory and client specifications and regulations.

Spec. No.	**Rev.**	**Standard Description**
EI 1560	2nd edition	Recommended practice for the operation, inspection, maintenance and commissioning of aviation fuel
Legal		
OHS Act, 1993		Occupational Health and Safety Act.
SANS 10142-1		The Wiring of Premises, Low Voltage Regulations

3 ELECTRICAL SCOPE OF WORK

Impressed Current systems employ a direct current (DC) power source to provide the necessary current to the metal structure, which effectively creates a cathode and thus reduces the corrosion rate of the metal.

The service provider is requested to provide a quote for the design of the Cathodic Protection (CP) system as well as a budget quote for the supply, installation and commissioning of the CP system. Assumptions made for the purpose of the budget costing need to be specified adequately.

3.1 The new 20" Jet Fuel Hydrant Feeder Line requires the design, supply, installation and commissioning of Impressed Current Cathodic Protection.

3.2 Cathodic Protection requirements for the existing in-service 18" Jet Fuel Hydrant Feeder Line.

3.3 Cathodic Protection requirements for the 20" decommissioned Jet Fuel Hydrant Feeder Line.

4 SITE DETAIL AND DESCRIPTION

The scope of works shall be completed at OR Tambo International Airport, Kempton Park, Ekurhuleni. The Contractor will be required to access the airside of the airport between the fuel storage depot and Alpha and Bravo Aprons.

5 NEW 20" JET FUEL FEEDER LINE SPECIFICATIONS

- Pipe material is Carbon Steel API 5L-B
- Pipe thickness – Sch 20 pipe (wall = 9.53mm)
- Pipe overall outer diameter – OD = 508mm
- Pipe overall inner diameter – ID = 488.94mm
- Total pipe length is 1780m
- Average depth below ground level – refer to drawing no. MC2620153-ISO-002, sheet 1 to 5

6 NEW 20” JET FUEL FEEDER LINE ROUTE

The new 20” Jet Fuel Hydrant Feeder Line route will basically run parallel and follow the existing 20” Jet Fuel Hydrant Feeder Line all the way to valve chamber VCM1. Refer to drawing no. L23638-DW-0500-001, ACSA 20” Fuel Feeder Line Replacement Site Plan Layout & Typical Sections.

7 EXISTING FEEDER LINES ROUTE & SPECIFICATIONS

The two existing Jet Fuel Hydrant Feeder Lines descend underground within the Fuel Depot and remain underground and proceed to Alpha and Bravo Aprons, where they then supply Jet fuel to the hydrant fuel rings at the Aprons. The two pipelines run parallel to each other until they split before the Bravo Taxiway. The 18” Jet Fuel Hydrant Feeder Line (Green line, in Figure1 below) runs parallel to the Bravo Taxiway until it reaches valve chamber VCM2. The 20” Jet Fuel Hydrant Feeder Line (Red line, in Figure 1 below) passes underneath Bravo Taxiway and then

runs parallel to the Alpha Taxiway, where it then passes underneath Indigo and Lima Taxiway respectively until it reaches valve chamber VCM1.

Existing In-Service 18" Line Specifications

- Pipe material is Carbon Steel API 5L-B
- Pipe thickness – Unknown (TBC)
- Pipe overall outer diameter – OD = 508mm
- Pipe overall inner diameter – Unknown (TBC)
- Total pipe length is Unknown (TBC)
- Average depth below ground level – TBC

Existing Decommissioned 20" Line Specifications

- Pipe material is Carbon Steel API 5L-B
- Pipe thickness – Sch 10 pipe (wall = 6.35mm)
- Pipe overall outer diameter – OD = 508mm
- Pipe overall inner diameter – ID = 495.3mm
- Total pipe length is Unknown (TBC)
- Average depth below ground level – TBC

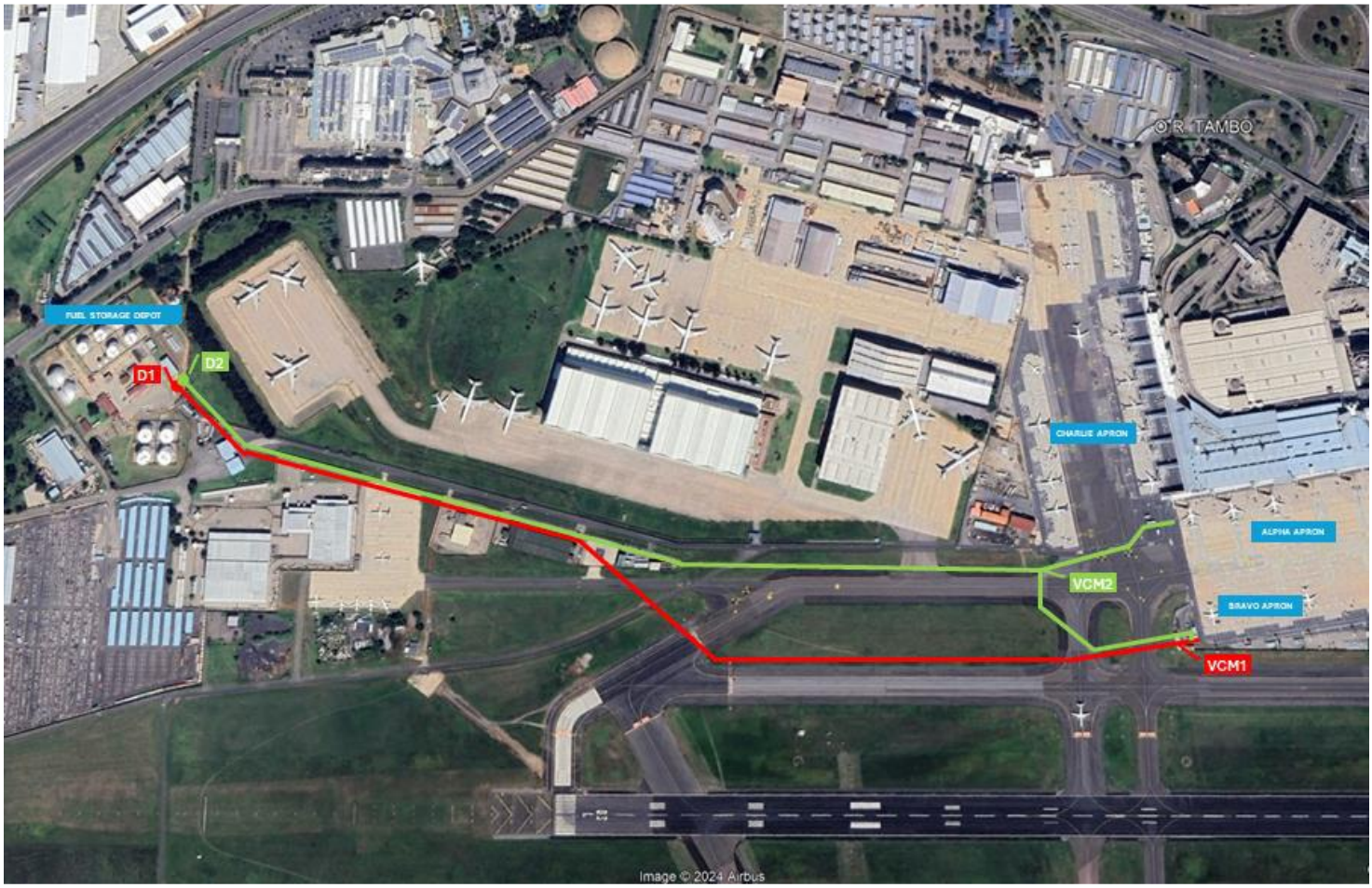

Figure 1: Existing 18" & 20" Feeder Line Routing

8 PROJECT SCHEDULE

8.1 The project is currently at Basic Engineering phase and following is the Detail Engineering phase which is planned to commence in November 2024.

8.2 The Site installation is scheduled to start April 2025.

9 CONTRACTOR'S RESPONSIBILITY

9.1 The Cathodic Protection Specialist shall provide proof of a high level of competency in the design and installation of the Impressed Current Cathodic Protection system to be implemented.

9.2 The Contractor shall provide competent technical supervision, skilled/unskilled labour, quality control, safety requirements and transportation to complete the Works in its entirety.

9.3 The Contractor shall provide all tools, material and consumables required to complete the Works in its entirety.

9.4 The Contractor shall provide test equipment, suitably calibrated by a South African National Accreditation System (SANAS) approved third party inspection company.

9.5 The Contractor shall provide a complete set of red-lined as-built documentation, in accordance with the requirements of this Works Information.

9.6 The Contractor shall not deviate from the AFC scope without prior Approval from MegChem Project Management.

10 SAFETY

10.1 The Contractor shall submit a Safety File for approval prior to mobilizing on Site; the requirements of which will be communicated prior to contract placement.

10.2 The Contractor is responsible to produce method statements, perform task risk assessments (TRA) and last-minute risk assessments (LMRA) for all the construction activities prior to commencing any on-site work activities.

10.3 A Permit to Work (PTW) is to be obtained and works are to be performed in accordance with the Health, Safety and Environmental Management Plan.

10.4 No work shall be undertaken on live equipment.

10.5 The Contractor shall allow for personnel to be trained by ACSA to be allowed access to the airside to perform work.

10.6 All work and site activities shall be carried in accordance with the ACSA site safety rules.

10.7 The contractor shall ensure that Daily toolbox talks are conducted by all members of the installation team.

11 QUALITY CONTROL

11.1 The construction and installation philosophy shall be done in accordance with the SANS Electrical Installation Standard Specifications.

11.2 The contractor shall ensure that all documentation (QC, Safety and Planning) is in place and approved by MegChem and/or ACSA.

12 PERMIT AND TRAINING REQUIREMENTS

12.1 The Contractor to allow for time to obtain ACSA training and to receive required working permits.

13 TESTING, COMMISSIONING and HANDOVER

13.1 Contractor to provide complete handover packs prior to commissioning.

13.2 Contractor to perform pre-commissioning tests on the cable installations.

13.3 All testing will be conducted by the Installation Contractor QC Inspector and MIE (Master Installation Electrician).

13.4 The testing shall be witnessed by an EC Engineer and ACSA Electrical commissioning personnel and as per the QC plan.

13.5 Contractor to conduct Continuity and Megger tests on cables. The Megger test results should be greater than 200 MΩ. The Continuity test results should be less than 0.3Ω.

13.6 Contractor to provide COC's for completed installations, clearly demarcating the battery limits of the certificates.

14 DOCUMENTATION

The listed documents are provided.

Doc No.	Title/Description	Rev
899-C-A2-5011	P&ID Fuel Storage Facility	I
1326-M-PID-3001	P&ID Leak Detection System Apron Fuel Hydrant Network	02C
L23638-DW-0500-001	ACSA 20" Fuel Feeder Line Replacement Site Plan Layout & Typical Sections	0A
MC2620153-ISO-002	Line no. FL-APB-0064-20"-A2, sheet no. 1 to 5	0C

APPENDIX A P&ID Fuel Storage Facility

APPENDIX B P&ID Leak Detection System Apron Fuel Hydrant Network

APPENDIX C ACSA 20" Fuel Feeder Line Plan Layout & Typical Sections

APPENDIX D Line no. FL-APB-0064-20”-A2, sheet no. 1 to 5