Combined Works Information

20'' Fuel Feeder Line Replacement at O.R Tambo International Airport, Johannesburg for ACSA.

DOCUMENT NUMBER: MCP2160079-CSOW-001 **REVISION:** 01

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REVISION HISTORY

REV.	DATE ISSUED	ORIGINATOR	DESCRIPTION
01	03-03-2025	A.F. Nel, A Badat, A Blose	Issue for Tender

Index.

1 Background.

Airports Company South Africa has identified a need to replace the existing 20-inch Jet A1 fuel feeder line at O.R. Tambo International Airport. This line is used for the refuelling of aircraft at the airport and runs underground from the fuel storage depot facility to the aprons where the aircraft are refuelled.

The supply of jet fuel to the aprons is enabled by six 132kW centrifugal pumps installed at the fuel storage depot. The pumps are connected to a common suction manifold and common delivery manifold and controlled by the variable speed drives. Each pump has a delivery capacity of approximately 5 000l/min.

The delivery manifold splits into two lines feeding the aprons, an 18- and 20-inch diameter feeder lines. The split in the lines is just before the two lines penetrate the ground.

The existing 20-inch line is approximately 1.8 km long and runs from the fuel storage depot to valve chamber VCM1. The line crosses the super-south service road at an average depth of cover of 1.7m. The second road crossing is along Bravo service road at an average depth of cover of 1.8m. The aircraft taxiway crossing on the Bravo and both India and Lima crossings have an average depth of cover of 1.5m and 1.7m, respectively. Overall average depth of cover for entire line is 1.55m.

The design pressure of the existing pipeline is 1950kPa at 50 degrees Celsius and maximum operating pressure varies from 620 - 1000kPa, excluding surge scenarios. The existing pipeline nominal thickness is 6.35mm, Schedule 10, Grade API 5L Grade A and designed to ASME B31.3 & 4 Code.

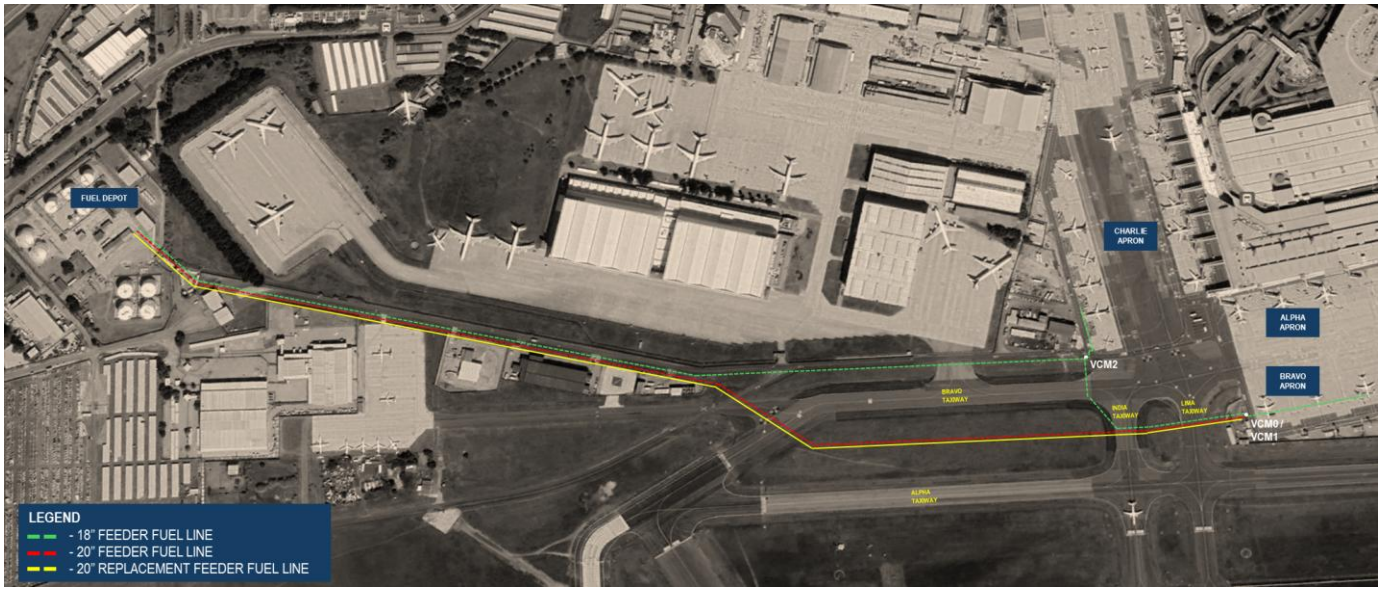
The Fuel feeder line replacement project consists of the following objectives:

a) Design, procurement and construction of new 20'' fuel pipe line to restore apron supply.

b) Installation of tie-in points into the respective supply and discharge areas.

c) Installation of piping supports, sleeves and connecting fittings as per control and instrumentation requirements.

d) Project implementation without impacting airside operations and as per end-user and stakeholder requirements.



Aerial View of proposed 20-inch line in yellow

2 List of definitions and acronyms/abbreviations.

Table 1: Table of abbreviations

ITEM	ABBREVIATION/DEFINITION
ACSA	Airports Company South Africa
AFC	Approved for Construction
AFD	Approved for Design
AIA	Authorized Inspection Authority
ANSI	American National Standards Institute
API	American Petroleum Institute
Area	The *Employer's* Security Area
ARV	Automatic Recirculation Valve
ASME	American Society of Mechanical Engineers
BEP	Basic Engineering Package
BFD	Block Flow Diagram
BO	Beneficial Operation
BOM	Bill of Materials
CAD	Computer Aided Design
CB	Circuit Breaker
CBA	Commercial Bid Analysis
CBS	Cost Breakdown Structure
CD	Compact disc
COC	Certificate of Compliance
Control Room	Operation, monitoring and supervision of the plant are performed therein with the aid of the operator interface system

ITEM	ABBREVIATION/DEFINITION
DB	Distribution Board
DBB	Double Block and Bleed
DCS	Distributed Control System/the DCS provides the requisite process control
ECC	Engineering and Construction Contract
EIA	Environmental Impact Assessment
Entry Permits	*Employer's* security permits
EOJ	End of Job (Documentation)
EPC	Engineering, Procurement, and Construction
Equipment Room	Houses all the control equipment for the DCS and ESD systems and their connections to and from the field
ESB	Emergency Stop Button
ESD	Emergency Shutdown System/the ESD implements the required 'critical' trips and interlocks
FAT	Factory Acceptance testing
FEC	Final Estimated Cost
FTA	Field Terminal Assembly
GA	General Arrangement
HAC	Hazardous Area Classification
H & MB	Heat & Mass Balance
Hardcopy	Copy on paper
HAZOP	Hazard and Operability Study
HP	High Pressure
HVAC	Heating Ventilation and Air-Conditioning
IBL	Inside Battery Limit
IFD	Instrumentation Flow Diagram
ISO	Isometric Drawing
LP	Low Pressure
MFD	Mechanical Flow Diagram
MCC	Motor Control Centre
MCFD	Metallurgical and Corrosion Flow Diagram
MOV	Motorized Operating Valve
MTO	Material Take Off
NCR	Non-Conformance Report
NDE	Non-Destructive Examination
OBL	Outside Battery Limits
OHS ACT	Occupational Health and Safety Act, Act Number 85 of 1993 as amended
OOM	Order of magnitude
ORTAFS	OR Tambo Airport Fuel Services

ITEM	ABBREVIATION/DEFINITION
ORTIA	OR Tambo International Airport
P&ID	Process & Instrumentation Diagram
PDA	Potential Deviation Analysis
PFD	Process Flow Diagram
PIT	Pressure Indication Transmitter
PIV	Permanent Internal Vehicle
PLC	Programmable Logic Centre
PMD	Plant Modification Diagram
PO	Purchase Order
PQR	Procedure Qualification Records
PRV	Pressure Relief Valve
PS	Pipe Support
PSV	Pressure Safety Valve
PVC	Polyvinyl Chloride
QA	Quality Assurance
QC	Quality Control
QCP	Quality Control Plan
QMS	Quality Management System (of the *Employer*)
RFC	Ready of Commissioning
RFO	Ready for Operation
RFQ	Request For Quotation
SABS	South African Bureau of Standards
SANS	South African National Standards
SAT	Site Acceptance Test
SCADA	Supervisory Control and Data Acquisition
SD	Semi-Definitive
Security	The *Employer's* Security Department and Personnel
Softcopy	Copy on personal computer disk format
SOW	Scope of Work
SPIR	Spare Parts and Interchange-ability Record
SP&L	Small Power & Lighting
TBA	Technical Bid Analysis
TVS	Tightness Control System
TSV	Temperature Safety Valve
UFD	Utility Flow Diagram
UoM	Unit of Measure
UPS	Uninterruptible Power Supply
UV	Ultraviolet radiation

ITEM	ABBREVIATION/DEFINITION
VC	Valve Chamber
VCM	Valve Chamber
VSD	Variable Speed Drive
WPS	Welding Procedure Specification

The following terms are used in this Scope with the assigned meaning:

Table 2: Table of definitions

Term	Meaning given to the term
Area	The *Employer*'s Security Area
Client or Employer	The *Client* or *Employer*, printed in italics, is the organisation who will become the owner after completion of the *works*.
Project Manager	"Project Manager" is the *Employer's* representative and the person who is administering the project on behalf of the *Employer* with the intention of achieving the *Employer's* objectives for the completed project.
Contractor	Is a person or organization who has a contract with the *Employer* to construct or install work.
Subcontractor	Is a person or organisation who has a contract with the *Contractor* to: • construct or install a part the *works* in the *Contractor's* scope or • provide a service necessary to provide the *works* or • supply Plant and Material which were wholly or partly designed specifically for the *works.*
Principal Contractor	Principle Contractor is as defined in the construction regulations of the OHS Act (Act 85 of 1993 as amended)
works	The *works,* printed in italics, are the facilities and all associated plant and materials to be fabricated, constructed, and installed by the *Contractor.* Work that is not printed in italics cover a broader definition and include work that is not in the scope of the *Contractor.*
Works Site Information	The Site Information is information which describes the Site and its surroundings.
Works Information/Works	The Works Information describe the *works* to be performed by the *Contractor* and states any constraints on how the *Contractor* provides the *works*.
Hardcopy	Copy on paper
Master Data	Master data constitutes all deliverables to be captured into the *Employer's* integrated management system e.g. drawings, data sheets, etc.
Nonconformance report (NCR)	A non-conformance report (NCR) is deemed to be due notification of a Defect
Plant and materials	Plant and materials are items to be included in the *works*
Others	Other Contractors performing work on site for the *Employer*.
Potential deviation analysis	A potential deviation analysis is a risk evaluation technique to evaluate the risks associated with a specific set of activities and to set mitigating action to reduce the risk (probability and/or impact).

Term	Meaning given to the term
Ready for Commissioning	Ready for Commissioning is achieved when the construction work for all the equipment and facilities required for the safe commissioning of a section or unit have been completed in accordance with the AFC drawings and specifications, and all non-operational (non-hazardous) testing to ensure equipment functionality and compliance with the specifications has been successfully carried out.
Ready for Operation/Ready for Commissioning	Ready for Operation (RFO) has been achieved for a unit or section when all facilities are available to safely support start-up, commissioning activities have been completed, all agreed defect items have been corrected and the tenance Disciplines have given clearance for operation. Ready for Commissioning is achieved when the construction work for all the equipment and facilities required for the safe commissioning of a section or unit have been completed in accordance with the AFC drawings and specifications, and all non-operational (non-hazardous) testing to ensure equipment functionality and compliance with the specifications has been successfully carried out (See Handover and Commissioning Strategy.
Beneficial operation/Ready for Operation	Beneficial Operation is achieved when a section has produced its first sustained manufacture of saleable, on-specification products, not necessarily at design capacity. Ready for Operation (RFO) has been achieved for a unit or section when all facilities are available to safely support start-up, commissioning activities have been completed, all agreed defect items have been corrected, and the tenance Disciplines have given clearance for operation.
Security Beneficial operation	The Employer's Security Department and Personnel, Beneficial Operation is achieved when a section has produced its first sustained manufacture of saleable, on-specification products, not necessarily at design capacity.

3 Description of the *Works performed by contractor*

3.1 Project Summary

The "20-inch Jet Fuel Feeder Line Replacement" project procurement and construction will be executed under one contract, and not multiple contracts. The contractor will appoint and manage sub-contractors where required to perform the work. The pipe will be supplied and installed by the contractor, who will also undertake the work inclusive of non-destructive testing, cold commissioning, and hot commissioning.

3.2 Work to be performed by the Contractor

3.2.1 Mechanical/Piping

3.2.1.1 The *contractor* undertakes all the necessary activities for the 20-inch fuel feeder line replacement.

3.2.1.2 Prior to the construction phase, the *contractor* should prepare, coat, line and pre-fabricate all necessary components as much as possible along with all relevant QA/QC testing. This

will be required to maximize the use of available airport down time for installation and minimize the possibility of delays within the down time window.

3.2.1.3 The *contractor* will allow for all piping spools, piping support brackets, support structures and components that are prefabricated at their workshop to be safely transported to site where it will need to be offloaded by the *contractor* at the designated laydown area.

3.2.1.4 The contractor will procure all rigging equipment required to perform all tasks to complete the works.

3.2.1.5 Pipe sleeving is to be jacked below sections that cross runways, roadways and taxiways and is to be performed by an appointed pipe jacking specialist or inhouse department of *contractor* if applicable and be at least 47m from taxiway centreline.

3.2.1.6 The *contractor* will ensure all sleeving area locations are marked up and dimensioned accordingly prior to Civil pit excavations and pipe sleeve sizing is selected. The pipe should be appropriately supported inside the sleeve with supports indicated in the AFC drawings

3.2.1.7 During the construction phase the *contractor* will execute the following tasks:

1.1. 20 inch fuel feeder line installation at ORTIA:

1.1.1. Preparation and blanking of existing material for fuel depot tie-in point 001-005 on P& ID 899 – C – A2 – 5011 and as per AFC drawings (See Appendix A).

1.1.2. Install prefabricated spool and lay-up for field welds.

1.1.3. Perform QC and NDT on field welds. Overal welding interval of 12m.

1.1.4. Open end of piping to be plugged at the end of every shift to prevent internal contamination ingres before.

1.1.5. Along with specialist jacking *contractor* assigned, pipe spools crossing high activity roadways to be jacked through with sleeves and excavation pits closed prior to airport down time window closing.

1.1.6. Install cable supports and attachment points where required by control and instrumentation.

1.1.7. Installation of pipe supports as per AFC drawings (See Appendix A).

1.1.8. Installation of thrust blocks along areas susceptible to line hammering effects as indicated on AFC drawings

1.1.9. Installation of motorized valve at VCM 1 and new supply tie -in points 006 and 007 on P & ID 1326 – M – PID- 3001 and AFC drawings, and removal and blanking of existing material.

3.2.1.8 The existing piping and other material replaced is to be taken to the Employers scrap yard. Allowance must be made by the *contractor* for the transportation of the old material to the scrap yard.

3.2.1.9 Post construction the *contractor* will complete all defect items identified and outstanding defect list items.

3.2.1.10 The *contractor* shall compile and transmit all EOJ documents for issued deliverables.

3.2.1.11 Clear the site.

3.2.2 Civil/Structural

3.2.2.1 The civil *Contractor* will excavate for trenching or open excavation. Due to the distance between the roadway and existing buildings located along the pipe route, shoring of excavations is required. Shoring is temporary *works* and therefore forms part of the *Contractor's* scope of work. Shoring design must be designed and signed off by a professionally registered Engineer (ECSA), whose calculations shall be submitted for review prior to excavation commencing. The average depth to the invert of the excavation consists of 1,55m cover, and 0,5m pipe diameter = 2,05m. Refer to point 1 "Background" where the actual depth of the pipeline varies. Given the working space required at the bottom of the excavation, the use of battered slopes would result in the top of the excavation being +-9m wide. This width would undercut existing road layerworks and security foundations, therefore shoring is required. Where it cannot be avoided, fencing or walls must be removed and reconstructed.

3.2.2.2 A specialist pipe jacking subcontractor, who will be appointed by the contractor, and will jack sleeves below runways, roadways (where possible), and taxi ways. Excavation for the pits required by the pipe jacking subcontractors, will be undertaken by the civil *Contractor.*

3.2.2.3 The mechanical / piping contractor will provide the installation of the 20" pipe, testing and supervise the insitu NDT of the pipe.

3.2.2.4 The civil *Contractor* will supply the necessary backfill material and compact to specification, once the 20" pipe has been installed.

3.2.2.5 The civil *Contractor* will reinstate the surface finish to match the existing finish – concrete, asphalt, grass etc.

3.2.2.6 The civil *Contractor* will break out walls of VCM0 for enlargement, extend VCM1 walls, and make good any new openings required in the existing valve box walls.

3.2.2.7 The mechanical / piping contractor will provide the piping tie-in through the wall and inside the valve box.

3.2.2.8 The civil *Contractor* will make good the valve box concrete, and any structural modifications required.

3.2.2.9 The civil Contractor will install new pipe supports inside the valve box, and at the commencement of the new 20" line at the tank farm

3.2.2.10 The civil contractor will install vehicle barrier guides in the tank farm area, and near the Tanker Gate.

3.2.3 Control and Instrumentation

The Contractor provides technically competent instrumentation personnel, tools and equipment to facilitate and complete the loop checks, testing and handover requirements in accordance with project schedules, specifications and drawings.

The Contractors' scope of work shall include the following with all quantities specified in the Bill of Quantities:

3.2.3.1 Contractor To Supply & Install Pressure Gauges:

a) PI-XXX1

b) PI-XXX2

3.2.3.2 Contractor To Supply & Install Pressure Transmitters:

a) PT-XXX1

3.2.3.3 Contractor To Supply & Install MOV:

a) MOV-XXX1

3.2.3.4 Contractor To Supply & Install Instrument Stands for:

a) HS-XXX1

b) PT-XXX1

3.2.3.5 Contractor To Supply & Install Instrument Tubing/Impulse line for Pressure Transmitters:

a) PT-XXX1

3.2.3.6 Contractor To Supply & Install Single Pair Cables for the following Instruments:

a) HS-XXX1

b) PT-XXX1

3.2.3.7 Contractor To Supply & Install Black & White Panel Wires for the following Loops:

a) HS-XXX1

b) PT-XXX1

c) ZSL-XXX1

d) ZSH-XXX2

3.2.3.8 Contractor To Supply & Install Black & White Panel Wires for the following Loops:

a) HS-XXX1

b) PT-XXX1

3.2.3.9 Contractor To Supply & Install Two Pair Cable for the following Instruments:

a) ZSL-XX1

b) ZSH-XX2

3.2.3.10 Contractor To Appoint System Service Providers:

a) HIMA (ESD) – Managed by MegChem

b) SIEMENS (DCS) – Managed by MegChem

3.2.3.11 **Contractor To Supply and Install all the Necessary Fitting for Coupling of Instruments**

a) The Contractor installs, tests and terminates the cabling for all new instrument items in the field in accordance with the documentation provided in Appendix A 16.1 (Bill of Quantities).

b) The Contractor provides temporary protection during the construction phase of the project for all new instrument related items against damage by grinding or welding activities.

c) The Contractor provides hand over documentation (loop packages, calibration certificates - by others, Certificates of Compliance, As Built mark-ups) in accordance with the documentation provided.

d) The Contractor provides a complete final As Built package of all documents issued to the Contractor by the Employer.

e) The Contractor finalises and agrees instrument locations and types of support with Employer field engineer. Calibrated and tagged instruments are generally mounted at convenient locations. Final placement is chosen and agreed with the Employer engineer on site prior to

installation to permit good access for operation and tenance and sufficient space provision to permit ease of removal and replacement.

f) The Contractor checks all materials for suitability.

g) The Contractor installs all instrument stands, frames, brackets and supports.

h) The Contractor uses the Hook-up drawings provided by Employer for the mounting of field instruments.

i) The Contractor ensures that no sharp edges are left on any supports and cable strapping.

j) The Contractor ensures that instruments are mounted in such a way that they are free from vibration. The Contractor provides suitable loops, or expansion sets for cables and impulse lines where vibration cannot be avoided.

k) The Contractor ensures that no acid resistant / tiled surface is drilled for fixing of any brackets or instruments. Any such fixings are performed by others.

l) The Contractor isolates all impulse tubing from mounting hardware by means of Teflon tape.

m) The Contractor provides a dedicated person to co-ordinate and oversee the installation of in-line instrument items as well as the removal and re-installation of instrument items (e.g. for flushing of lines) by the Contractor's piping Contractor.

n) The Contractor ensures that:

- The instrument direction of flow corresponds with the pipe work direction of flow.
- The instrument controls are easily accessible to the operator / tenance staff and correctly orientated with respect to pipe work or vessel.
- The tag label is easily seen from grade, platform or access ladder.
- Adequate space is available all around the instrument to permit tenance access to the device, and to permit its removal and replacement without disassembling other equipment.
- Impulse point connections are correctly orientated to comply with hook-up installation requirements and are tagged at the piping / instrument interface.

o) The Contractor notifies the Employer of the date when each part of the installation is complete and ready for inspection and testing.

p) The Contractor certifies the correct installation of each item to the Employer in writing in the form of a "Ready for Inspection" certificate, which is included in the loop package.

q) The Contractor touches up all areas where welding or cutting has taken place with an approved paint as per ACSA Specification.

r) The Contractor provides temporary protection for cable, tubing and piping entries on instruments that are installed but not yet tubed or cabled.

s) The Contractor provides temporary protection of instruments and instrument boxes after initial installation against weld splatter, grinding sparks by means of heavy duty strong durable bags of a suitable material until the item is handed over.

u) The Contractor issues each artisan a proper set of tools to perform the work.

v) The Contractor installs, connect checks & loop checks all works prior to any demolition. The Contractor removes / demolishes existing equipment only after new installations have been

checked and accepted by the Employer. The Contractor must take note that there will be a period of time between acceptance of new installations and demolition of existing equipment. The Contractor shall allow for this in his offer as the Employer accepts no responsibility for standing time.

3.2.3.12 **Instrument tagging, labels**

a) The Contractor supplies and installs all core markers, cable markers, cabinet labels, field tagging and field labels.

b) The Contractor provides cable numbering tags of 316ss affixed with stainless steel wire, with all sharp ends bent over to avoid personal injury. The Contractor provides core markers of the Grafoplast type.

c) The Contractor provides and installs labels for field instruments, assemblies and junction boxes in accordance with the relevant documents in Appendix A. Laser engraved labels on SST shall be used. Labels are affixed by means of stainless-steel screws, bolts and nuts or silicone.

d) The Contractor provides and installs labels for panels, equipment cabinets, system cabinets, in accordance with the relevant documents in Appendix A. Labels are affixed by means of stainless-steel screws, bolts and nuts or silicone.

3.2.3.13 **Calibration, Testing, Pre-Loop Checks and Loop Checks**

a) The Contractor performs calibration tests on all new instruments and provides calibration certificates to form part of the loop check packs.

b) The Contractor ensures that each completed instrument installation (loop) is inspected and accepted by the Employer once mechanically complete.

c) The Contractor cleans and pressure tests all instrument impulse tubing and provides pressure test certification which is included in the loop package. Pressure testing of impulse tubing is performed in accordance with the relevant ACSA specification.

d) The Contractor applies a commodity test only to instrument air supply tubing i.e. commissioning of the air supply and leak testing with soapy water.

e) It is mandatory for the Contractor to perform pre-loop checking activity prior to loop checking in conjunction with the Employer. The Contractor ensures that point-to-point checks have been performed internally in order to guarantee correctness of installation as per detail design. The Contractor shall supply documented proof of this activity and include it in the loop packages.

f) The Contractor performs the loop checking activity in conjunction with and to the satisfaction of the Employer. The Contractor ensures that each completed loop is signed off as accepted by the Employer.

g) Commissioning the process plant after the RFC date shall not be deemed part of this works and shall be performed by others.

3.2.3.14 **Routing**

3.2.3.14.1 Cable Racking

a) Contractor supplies, fits, aligns and installs secondary cable racking, splice kits and fix cable racks in locations on steel structures, walls, and ceiling. Install all fixtures and splicer brackets, supports and components. Secondary supports of Unistrut, all fixing material and all earth

bonding are included in Installation. Cut points to be protected against corrosion using galvanized paint according to approved procedure.

b) Cable racking is installed above ground vertically, generally supported off the sides of the pipe racks and structural steelwork. Where multiple racks run in the same direction, they are installed vertically one above the other and not back-to-back. Any proposed back-to-back racking is strictly subject to the Employer approval.

c) Touching up of all areas where welding or cutting has taken place with an approved galvanizing paint.

d) Cable racking installation, including fixtures and connecting parts are measured by length as installed between fittings. Rate to include fabrication, fit, align, and protect against corrosion (according to specification).

e) The bill of quantities include for the cost of the supply and installation of all racking, racking covers, fittings, purpose made fittings, racking deviations, cleats, bolts, splice plates, cross-bonding earthing etc. for fixing horizontally, vertically and in all planes and directions to steel, concrete or other supports. Support steelwork, plate work, Unistrut measured separately. Contractor to include for all fixing materials to such supports where required.

f) The bill of quantities includes all costs of site measuring, transportation, erection, and inspections for the site design and routing of secondary cable racking and supports.

g) The Contractor shall make use of welding blankets when performing any hot work in the Plant areas. This will form part of the permit conditions for all hot work activities.

3.2.3.14.2 **Cable Support System**

Contractor to supply and install mild steel hot dipped galvanized conduit and Unistrut for secondary cable supports.

3.2.3.14.3 **Support Steelwork**

a) Supply all tools, equipment, machines, welding filler materials, cutting gasses, consumable materials, to fabricate and install mild steel hot dipped galvanized angles, flat bar, channels on steel structures or concrete to perform the full scope of work.

b) Install, plumb and align mild steel hot dipped galvanized structures, support channels and angle steelwork and droppers, fixings, brackets, holders, supports, covers, assembly plates, or the like on steel structures, floor, wall, or ceilings. All parts to be protected against corrosion according to specification. No deductions will be made for holes, fasteners, milling or planning and no additions will be made for rolling margin, welded metal or shop fasteners. Touch up galvanizing according to specification.

c) Where welding to existing structures, clean supporting and connecting surfaces. Touch up all intermediate and final paint coats according to specification.

3.2.3.3.4 Scaffolding and Fireproofing

a) The Contractor shall be responsible for supplying and co-ordinate all scaffolding required to perform works as per bill of quantities. The Contractor shall only appoint an regsitered approved scaffold Vendor.

b) No existing fireproofing will be tampered with for any reason whatsoever. Where the route is fireproofed, a new parallel section of racking will be installed and fireproofed. Only after such an installation has been accepted (this includes defecting & loop checks) by the Employer the Contractor allowed to fireproof that section.

3.2.3.15 Conductors

3.2.3.15.1 Safety Earth

a) Above ground earth connections and lightning protection are carried out in accordance with ACSA (Pty) Ltd, safety earth standards.

3.2.3.15.2 Instrument Cables

a) The Contractor supplies and installs all multipair / multicore home run cables as indicated in the bill of quantities.

b) The Contractor supplies and installs all field Signal cables as indicated in the bill of quantities.

c) The Contractor supplies and installs all field 3 Core SWA power cables as indicated in the bill of quantities.

d) The Contractor to test and inspect all cables with the Employer before installation. This is a mandatory pre-installation test to be documented and included in loop packages.

e) The Contractor provides stainless steel cable strapping (“Bandit” type).

f) The Contractor supplies and installs all instrument earth connection cables.

g) The Contractor replaces cables damaged whilst being installed.

h) The Contractor tests all cables for continuity and insulation prior to and following installation and provides documentation confirming that the tests have been performed and witnessed by the Contractor and Employer at both stages.

i) The Contractor seals all cable entries into buildings using a method approved by the Contractor and the Employer.

j) The Contractor ensures that cables terminated in field-mounted instruments have their signal shields cut back and insulated with heat-shrink.

k) The Contractor ensures that all cables are completely terminated i.e. all spare cores are wired to terminals.

l) The Contractor ensures that cables that terminate within control buildings and control cabinets / panels are glanded and completely terminated and all signal shields are terminated on earth bars within the cabinets / panels. These earth bars are mounted on standoff isolators and connected to the HQE. The Contractor ensures that all unused cores are terminated and tied to HQE

3.2.3.15.3 Impulse and air supply tubing, winterization, steam tracing

a) The Contractor supplies and installs all instrument pneumatic impulse tubing and fittings in accordance with the hook-up diagrams. All tubing to be ½ inch OD seamless 316 stainless steel tubing (ASTM A269) of 0.049-inch wall thickness, connected with double ferrule 316 stainless steel type compression fittings of an approved manufacturer.

b) The Contractor isolates all impulse tubing from mounting hardware by means of Teflon tape or equivalent approved method to avoid galvanic corrosion. The Contractor refers to the material bill of quantities and hook-up diagrams for tubing requirements.

c) The Contractor provides winterizations for all impulse tubing carrying water and/or condensate in the form of an approved tape or cloth wrapped around each tube, as well as the instrument manifold, in an approved manner.

d) The Contractor provides certification for all tubing and fittings.

3.2.3.16 **Plant Works**

3.2.3.16.1 **Instrumentation Installations**

a) The Contractor supplies and installs instrument equipment as per the bill of quantities.

b) The Contractor stores these equipment and materials in his own store and all handling on site and installation or erection in accordance with the drawings and specifications, of the item to which the rate refers and shall include all labor and supervision thereof, provision and installation of all materials and fixing items, packers, shims, etc. and where necessary modification to free issue material i.e. cutting etc. to comply with the Employer's requirements and all tools, etc. necessary for the installation of the specific item but excluding the supply of the specific item.

3.2.3.17 **Free issue materials**

a) All mechanical valves and Instrumentation tag equipment will be free issued by the employer. The balance of materials must be procured by the contractor. Refer to Appendix L for preferred vendor list.

3.2.3.18 **Plant – Instrumentation**

3.2.3.18.1 **DCS / ESD Equipment Cabinets (N/A to This Project)**

a) New hardware shall be installed by Honeywell or certified supplier approved by the employer. All cabling and racking will be done by the Contractor. The landing of new cables shall be terminated by the Contractor.

3.2.3.18.2 **Junction Boxes (N/A to This Project)**

a) Existing Junction Boxes will be used.

3.2.3.18.3 **Supervision of installation of In-Line instruments**

a) Contractor to provide supervision of installation of in-line instruments.

b) Contractor to provide rates for removal and re-installation of in-line instruments that will be removed for flushing. Rates shall include for, the safe-keeping and protection of all removed instruments, and to allow for functional checks after reinstatement.

3.2.3.18.4 **Hook-Up's**

a) The Contractor shall allow for the full installation of free issue instruments.

b) The Contractor to supply all erection materials unless otherwise stated.

c) The Contractor to ensure that all materials have been allowed for complete installation. All supports are to be galvanized to ACSA specification. This item to include all pressure, leak testing, etc. as called for in the works information specifications and O.H.S. Act.

d) The Contractor shall allow for Winterization on all condensate / condensable installations.

e) The Contractor must include for high-pressure air or inert gas cylinders for pressure testing.

f) The Contractor shall ensure that every instrument is correctly installed with respect to at least the following considerations:

- The instrument direction of flow shall correspond with the pipe work direction of flow.
- The instrument controls are easily accessible to the operator / tenance staff and correctly orientated with respect to pipe work or vessel.
- The tag label is easily seen from grade, platform or access ladder.
- Adequate space is available all around the instrument to permit tenance access to the device, and to permit its removal and replacement without disassembling other equipment. Control valve actuators shall be correctly oriented to allow access to the electrical connections from the nearest platform.
- Impulse point connections are correctly orientated to comply with hook-up installation requirements. Impulse tap points shall be tagged at the piping / instrument interface.
- The Contractor shall notify the Employer of the date when each part of the installation shall be complete and ready for inspection and testing.
- The Contractor shall certify the correct installation of each item to the Employer in writing in the form of “Ready for Inspection” certificate, which shall be included in the loop package.
- Touching up of all areas where welding or cutting has taken place with approved epoxy paint or galvanizing method.
- Temporary protection shall be provided for cables, tubing and piping entries on instruments that are installed but not yet tubed or cabled.
- Tools – each artisan shall be issued a proper set of tools by the Contractor to perform the work. Sharing of tools is not acceptable.
- When requested, withdraw from the Employer store, calibrate to traceable standards, issue calibration certificate and re tag.

g) The Contractor provides all instrumentation testing and calibration facilities and equipment required for the project, i.e. calibration shop, field calibration equipment, etc. the testing of all cabling and equipment and calibration of instruments and associated equipment shall be in accordance with the Employer and Employer’s specifications and standards.

h) The Contractor shall have sufficient quantities of all test equipment available, in working order, at all times during the entire project.

3.2.3.19 **Terminations**

3.2.3.19.1 **Terminate instrumentation cables**

a) Prior to the start of wire termination activities, the Contractors wiring tools shall be inspected and approved by the Employer. Wire stripping tools shall be purpose made for this duty and may be either mechanical or thermal in operation. Neither type shall nick or cut wire strands. The use of pliers, side cutters or paring knives is specifically forbidden for wire stripping. Crimping tools shall be fitted with ratchets to ensure that the tool only releases after the correct crimping pressure has been applied to the terminal lug. The use of side cutters, pliers, or non-ratchet crimping tools is specifically forbidden for crimping. The Contractor provides

insulated twin-grip bootlace lugs for wire end terminations, which grip the wire insulation as well as the wire.

b) Supply, install and make off cable terminations in the field complete with glands, locknuts, earth tag (if required), lugs, ferrules, core markers (Grafoplast), harness, tags, heat shrink materials, etc. for complete installation.

c) Insert laid cable into cable gland, cable end box, and cabinet or casing, cut back and connect it.

d) In general, all cables shall be completely terminated i.e. all spare cores wired to terminals.

e) Cables that terminate within control buildings and control cabinets' panels shall be glanded and completely terminated; and all signal shields shall be terminated on earth bars within the cabinets / panels. These earth bars will be mounted on standoff isolators and connected to the HQE. Note that all un-used cores shall be terminated and tied to HQE.

f) Terminations are measured per cable and not per core.

g) Quantities are for one complete cable end.

h) The rates include the cost of supply and installation, of all required termination materials including glanding, drilling of holes, inserting of glands, tapping if required, (authorized vendor to certify) in all Instrument equipment, cable glands, shrouds, lugs, sleeves Grafoplast labelling, all labour required.

3.2.3.20 **Testing and Documentation**

3.2.3.20.1 **Standardized Specifications**

a) Although not bound or issued with the Works Information, the following Standardized Requirements apply and form part of the Works Information. The Contractor ensures that he is in possession of the following documents:

- The Occupational, Health and Safety Act (No 85 of 1993) and Regulations.
- The Explosives Act (Act No 26 of 1956 as amended) and the Regulations.
- Units of Measurement: System International (SI).
- Employer's Standard Site Rules and Regulations.
- Applicable ASME Codes.
- ACSA Specifications: The Contractor must ensure that he is familiar and in possession of the latest Specifications as listed in Appendix 16.7

3.2.3.20.2 **Instrument Testing**

a) Instrument testing shall include but not be limited to:

- Verification of compliance of instrument to Specification and data sheet.
- Linearity repeatability and static alignment.
- Switch settings, range verification and dead band.
- Visual inspection for tagging, model, material, process connection pressure rating.
- Correct orientation and elevation.
- Visual inspection of enclosure, area classification, and accessories.

b) This item to include all materials and work as described in ACSA specification No. SP-70-7 "check-out procedure" for the electronic instrument loops.

c) Every Loop is to have a loop package in accordance with procedure, any device with allocated I/O to the DCS or ESD systems will be classified as part of a loop as specified by the loop number in the instrument Index.

d) Removal and reinstatement of equipment (hydro testing, flushing etc.).

e) This item to include all pressure, leak testing, etc. as called for in the general specification and the Occupational, Health and Safety Act (No 85 of 1993).

f) All cables shall be tested for continuity and insulation - the Contractor shall provide documentation confirming that these tests have been performed.

g) The Contractor is responsible for taining the instrument loop packages in good order. The loop check teams are responsible for marking up the loop packages to “as-built” status. This activity includes the marking-up of all affected drawings and/or specifications at “as-built” status in red ink so that at time of loop check, all drawings relating to that loop are at “as-built” status. The Contractor shall appoint a loop package controller who shall be held responsible for the collation of all “as-built” mark-ups produced by the loop check teams and who shall liaise with the supervisor for marking up of non-loop pack related drawings.

h) Installation drawings shall be marked up on an on-going basis with all deviations, modifications or additions. Any proposed deviations, modifications or additions shall require prior written approval by the Employer.

i) At the RFC date a complete set of all “as built” marked up drawings shall be forwarded to Employer.

j) Cleaning and pressure testing of all instruments, impulse tubing and provision of pressure test certification, which shall be included in the loop package. Pressure testing of impulse tubing and pneumatic installations shall be performed in accordance with the relevant ACSA specification. Air supply tubing will be subject to a commodity test only i.e. switching on the air supply and checking for leaks with soapy water.

k) Loop checking of all completed installations. Every instrument loop shall be individually powered and tested by the Contractor to the satisfaction of Employer. The Contractor shall provide documentation to the effect that the installation is complete, has been pre-tested, and is ready for loop check. Calibration certificates shall be completed for all instruments in each loop, and included in the loop package, together with any other relevant documentation (e.g. hazardous area docs, etc.). Comprehensive loop testing shall then be performed in the presence of Employer in general accordance with the Works l) Information. The Employer shall sign a document of formal acceptance for each loop after loop checks are completed. Any work on loop-checked instruments (e.g. removal for flushing or replacement of site-damaged instruments) must be coordinated with the Employer and the correct reinstatement procedure followed.

m) Others are responsible for the hot commissioning of the process after the RFC date. However, the Contractor may be required to provide a small team of technicians complete with calibration equipment to assist commissioning engineers on an hourly basis.

3.2.3.20.3 **Instrument Documentation**

a) The Contractor creates Loop packages as above for each and every instrument loop that has physical I/O. Compilation of loop check packages to an agreed standard. Instrument tag numbers shall be in accordance with the Instrument Index. General loop packages are created for local items like pressure gauges and temperature gauges that have no I/O points. General packages are also created for common items such as cable racking, junction boxes, marshalling cabinets, Analyzer House, analyzer cabinets.

b) A typical loop package consists of a plastic file folder ("Durable 2573" or equivalent) containing as a minimum the following documents:

- Ready for inspection/ready for loop check/loop check acceptance certificate.
- Check list/s
- Instrument data sheets.
- Calibration certificates.
- Cable continuity and insulation test certification.
- Impulse tube cleaning and pressure test certification.
- Hazardous area certification.
- Instrument loop diagram.
- Hook-up diagram.
- Defect list.
- Other documents may be included where appropriate, such as:
- Certificate of Compliance.
- Meter run / orifice plate inspection certificate.
- P&ID / MFD.
- Pressure test certification.
- Vendor factory calibration certification.

3.2.4 Electrical Contractor

3.2.4.1 **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, tenance and commissioning of aviation fuel
Legal		
OHS Act, 1993		Occupational Health and Safety Act.
SANS 10142-1		The Wiring of Premises, Low Voltage Regulations

3.2.4.2 **Electrical Scope of Work**

3.2.4.2.1 The supply, installation and commissioning for the Small Power & Lighting (SP&L) within Valve Chamber VCM1, which is situated on the airside.

3.2.4.2.2 Hand excavations to confirm the SP&L supply cable routing from “Power Distribution Centre A” DB to Valve Chamber VCM1.

3.2.4.2.3 After cable routing confirmation, install 2 x cables and 4 x cable joints.

3.2.4.2.4 Reinstatement and making good of hand excavated cable trench on completion of cable installation.

3.2.4.2.5 The load capacity verification within “Power Distribution Centre A” DB for the additional SP&L within Valve Chamber VCM1.

3.2.4.2.6 The supply, installation and commissioning for the power supply cable, all associated accessories and electrical equipment to the Motorised Operating Valve (MOV) APB DBB XX1 MOT, which is situated at the storage Tank Depot.

3.2.4.2.7 The load capacity verification within “Distribution Board-DB-B” for the additional supply to the new MOV.

3.2.4.2.8 The necessary Earthing & Bonding for the new installation.

3.2.4.3 **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 both the Tank Farm and the airside of the airport between the fuel storage depot and Alpha and Bravo Aprons.

3.2.4.4 **Description of the Electrical Works**

3.2.4.4.1 **Valve Chamber VCM1 SP&L**

a) VCM1 is being extended/enlarged within this project scope, therefore, additional Lighting is required for the Valve Chamber extension and both the existing MOV and SP&L power supply cable routing needs to be confirmed.

b) The existing SP&L and MOV power supply cable routing confirmation shall be required to avoid possible damage to the cables when the Valve Chamber VCM1 is under construction of being extended/enlarged and to confirmed whether or not the power supply cables shall require the necessary cable joints.

a) There are 2 x instrument control system enclosures mounted on the Eastern side wall of the Valve Chamber VCM1, that receives its supply power from the existing SP&L reticulation. With the Valve Chamber VCM1 extension, this instrument supply cable shall be moved and re-installed at the new instrument control system mounted positions. The final positions of the instrument control system enclosures shall be determined by others.

d) The additional Lighting source of power will come from the existing lighting reticulation network, will tie-in/be looped from the nearest existing light circuit within Valve Chamber VCM1.

e) The 1 x existing light within VCM1 shall be replaced and then there shall be 4 x additional lights to be installed due to the expansion of VCM1. ALTSA A Series Ex 60W Floodlights shall be supplied and installed. Refer to project cable schedule, Lighting Data Sheets and Lighting Layout drawing.

f) Both the existing SP&L and the MOV within Valve Chamber VCM1 are currently being fed from "Power Distribution Centre A" DB.

g) The installation contractor is to confirm that the existing lighting circuit will have sufficient load capacity to now supply the new SP&L requirements.

3.2.4.4.2 **New Motorized Operating Valve, APB DBB XX1 MOT**

a) The new MOV shall be located/installed within the storage Fuel Depot and shall be supplied power from 400VAC "Distribution Board DB-B" within Substation 1 Fuel Farm Low Tension Room. The power supply cable required shall be 4C x 4mm², 600/1000V, PVC/SWA/PVC cable. The supply and installation of the supply cable shall be on existing cable rack and trench majority of the cable route. There shall be a portion of the cable route where new 150mm wide cable rack will be required to be supplied and installed. Refer to Cable Routing Layout drawing MCP2160079-CRL-001 (see Appendix G)

b) There is sufficient space within DB-B for the supply and installation of a 3-pole, 10A, din-rail mounted miniature circuit breaker for the supply to the MOV.

c) The installation contractor is to confirm that the existing 400VAC Distribution Board DB-B has sufficient load capacity for the new MOV supply.

3.2.4.4.3 **Earthing & Bonding**

a) The Earthing & Bonding for the required MOV electrical scope at the storage Fuel depot shall be fed from the existing and nearest above ground earth tie-in point. Therefore, there are no proposed changes to the existing earthing system nor further earthing design requirements.

b) The earth cable to be used shall be a single core 16mm² earth PVC insulated conductor.

c) The earthing for the SP&L at the Valve Chamber VCM1 shall comply and be fed from the existing Lighting reticulation network.

3.2.4.4.4 **Cable Tags & Strapping and Equipment Labelling**

a) The new cables installed within this SOW shall have aluminium cable tags installed on the cable every 10m apart for identification, with UV protected cable ties.

b) The existing Distribution Board DB-B that supplies power to the new MOV at the storage Fuel Depot shall require an appropriate label "Rotork D3" for the new 10A circuit breaker installed.

3.2.4.4.5 **Cathodic Protection**

3.2.4.4.5.1 A cathodic protection system is required to provide protection against corrosion.

3.2.4.4.5.2 UDI Engineering Services cc was requested by Megchem to provide a quotation to design a cathodic protection system for the new 20" Jet fuel Hydrant feeder pipeline at OR Tambo International Airport.

3.2.4.4.5.3 The scope of works is as per the functional specification document (Appendix K-MCP2160079-FSR-001):

3.2.4.4.5.4 The contractor to include the supply, installation and commissioning of the CP system.

3.2.4.4.6 **Testing, Commissioning and Handover**

3.2.4.4.6.1 Contractor to provide complete handover packs prior to commissioning.

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

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

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

3.2.4.4.6.5 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.

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

3.2.4.5 **Hazardous Area Classification**

3.2.4.5.1 With reference to the ACSA Bulk Storage Tank Facility HAC drawing 922-E-PL01-001 Rev.01, see Appendix H.

3.2.4.5.2 The HAC, for the project SOW at the storage Fuel Depot, shall be Class I Zone 2. This is aligned to the current HAC of the existing plant area in which this project scope of work is an extension thereof.

3.2.4.5.3 The HAC, for the project SOW at Valve Chamber VCM1, is currently being assumed to be Class 1 Zone 2. Unfortunately, there is no existing drawings and information to confirm the site HAC.

3.2.4.6 **List of Assumptions/Identified Risks**

3.2.4.6.1 The existing Earthing infrastructure is functional and in accordance with the project specifications.

3.2.4.6.2 The existing Lighting switching on/off control philosophy is functional and appropriate for use for this project.

3.2.4.6.3 The existing SP&L supply DB, equipment, site conditions and integrity are functional and in accordance with the project specifications.

3.2.4.6.4 The existing MOV's supply DB, site conditions and integrity are functional and in accordance with the project specifications.

3.2.4.6.5 The HAC, for the project SOW at Valve Chamber VCM1, is not confirmed and there are no project drawings available. The risk is that the Contractor will not be able to issue a complete COC.

3.2.4.7 **Exclusions from electrical scope**

3.2.4.7.1 Isolating of supply power within existing Client DB's.

3.2.4.7.2 Modification or upgrading of existing equipment and infrastructure not in compliance with the specifications is excluded from this project scope.

3.2.4.7.3 No Earthing and Bonding for the piping is required due to Cathodic Protection.

3.2.5 Pipe Jacking Requirements

3.2.5.1 In order to install 1200mm concrete sleeves, pipe jacking is required where the 20” pipe crosses the taxiways. Elsewhere, open excavations (with shoring) will be adopted for the installation of the new 20-inch pipe. Specialized installation contractor to be appointed and managed by the contractor to procure and install the two new sleeves under Bravo Taxiway and India/Lima Taxiways as per the requirements listed in Appendix I.

3.3 Responsibility Matrix

Responsible Entity **Activity**	Applicable	Employer	MegChem & Consultants	M&P Contractor	E&I Contractor	Pipe jacking contractor	Civil contractor	Structural Steel contractor	Insulation Contractor	Rigging Contractor	GPR Scanning Contractor	Cathodic Protection			
Design															
Process design	**Y**		X												
Mechanical design	**Y**		X												
Piping design	**Y**		X												
Electrical design	**Y**		X									X			
Instrumentation design	**Y**		X												
Programming and changes on HMI	**Y**				X										
Programming of DCS & ESD	**Y**				X										
Structural steel design	**Y**		X												
Structural steel shop detail drawings	**Y**							X							
Civil Design	**Y**		X												
Cathodic protection Design	**Y**		X									X			
Fire design	**N**														
Specialist Site Measurements and Services															
3D Scanning	**N**														
GPR scanning	**Y**	X									X				
GEO Tech studies	**Y**						X								
Land Surveying	**Y**		X												
(As built topographical survey)	**Y**						X								
AIA	**Y**	X	X												
NDE's (x-rays, PT/MT etc.)	**Y**			X											

Responsible Entity **Activity**	Applicable	Employer	MegChem & Consultants	M&P Contractor	E&I Contractor	Pipe jacking contractor	Civil contractor	Structural Steel contractor	Insulation Contractor	Rigging Contractor	GPR Scanning Contractor	Cathodic Protection			
Procurement															
Mechanical and process equipment (Material for Refurbishment)	**Y**			X											
Piping material (material on ISO's)	**Y**			X											
Structural steel	**Y**							X							
Valves	**Y**			X											
Instruments (flow meters, thermowell, Level gauges, flow orifice etc.)	**Y**				X										
Meter runs	**N**														
Transmitters	**Y**				X										
Condensate pots for instrumentation	**N**														
Instrument stands and brackets, Tubing and fittings, Conduits, Cable racks, Cable straps, JB's	**Y**				X										
Air supply Manifolds	**N**														
Procurement of barriers for DCS/ESD panels	**Y**				X										
Instrumentation Cables - single pairs	**Y**				X										
Instrumentation Cables – multi pairs	**Y**				X										
Electrical cables	**Y**				X										
Lights /Luminaires	**N**														

Responsible Entity **Activity**	Applicable	Employer	MegChem & Consultants	M&P Contractor	E&I Contractor	Pipe jacking contractor	Civil contractor	Structural Steel contractor	Insulation Contractor	Rigging Contractor	GPR Scanning Contractor	Cathodic Protection			
Start stop hand stations	**N**														
Light brackets	**N**														
DB's	**Y**				X										
MCC Switchgear buckets	**Y**				X										
Construction															
Mechanical and piping *Works*															
Safe making of equipment and piping	**Y**			X											
Decontamination of material	**Y (TBC)**			X											
Pipe fabrication	**Y**			X											
Pipe stripping out	**Y**			X											
Pipe installation	**Y**			X		X			X						
Degassing	**Y**			X											
PWHT	**N**														
Coating of Underground piping	**Y**			X											
Lining of inside of the pipe	**Y**			X											
Fireproofing	**N**														
Grouting of pipe supports	**Y**						X								
Grouting Equipment	**N**														
Grouting Instrument stands	**N**														

Responsible Entity **Activity**	Applicable	Employer	MegChem & Consultants	M&P Contractor	E&I Contractor	Pipe jacking contractor	Civil contractor	Structural Steel contractor	Insulation Contractor	Rigging Contractor	GPR Scanning Contractor	Cathodic Protection			
Installation vessel internals	**N**														
Cutting and/or repairing of pressure vessel shell	**N**														
Pneumatic and/or hydraulic pressure testing	**Y**			X											
Provide N_2 for Pneumatic pressure testing	**N**														
Provide N_2 for stainless steel welding	**N**														
Provide water for pressure test	**Y**	X													
Sandblasting & Painting piping	**Y**			X											
Pickle and passivate	**N**														
Chemical cleaning of lines	**N**														
Install locking devices	**Y**			X											
Provide cranes for light rigging	**Y**			X						X					
Provide cranes for heavy rigging	**Y**									X					
Offloading of free issued equipment	**Y**			X			X			X					
Transport of materials	**Y**			X			X								
Transport of free issued equipment from laydown area to site	**Y**			X			X								

Responsible Entity **Activity**	Applicable	Employer	MegChem & Consultants	M&P Contractor	E&I Contractor	Pipe jacking contractor	Civil contractor	Structural Steel contractor	Insulation Contractor	Rigging Contractor	GPR Scanning Contractor	Cathodic Protection			
Transport redundant material to reclamation yard	**Y**			X			X								
Provide scaffolding	**Y**			X			X								
Supply and install insulation and lagging	**N**														
Fireproofing mechanical equip.	**N**														
Steam tracing	**N**														
Refractory	**N**														
Provide packers for mechanical equip / Piping shims	**Y**			X											
Pump laser alignment	**N**														
Unlock and lock spring support	**N**														
Refurbish spring supports	**N**														
Installation of in-line instruments (e.g. in-line flow meter, flow control valves, etc.)	**Y**				X										
Installation of thermowells	**N**														
Instrumentation *Works*															
Strip out redundant cables and cable racks and conduits	**Y**				X										

Responsible Entity **Activity**	Applicable	Employer	MegChem & Consultants	M&P Contractor	E&I Contractor	Pipe jacking contractor	Civil contractor	Structural Steel contractor	Insulation Contractor	Rigging Contractor	GPR Scanning Contractor	Cathodic Protection			
Strip out redundant instruments	**Y**				X										
Install surface instrumentation, condensate pots, Press. & Temp. transmitters etc.	**Y**				X										
Install cables, cable racks, conduits, trunking, etc.	**Y**				X										
Cross wiring	**Y**				X										
Provide inert gas for leak testing of tubing and functional testing of control valves	**Y**				X										
Installation of DCS/ESD	**Y**				X										
Fire/flame proofing	**N**														
Installation of IO Cards / barriers in DCS/ESD panels	**Y**				X										
Winterisation of instrument tubes	**N**														
Grouting instrumentation stands	**Y**				X		X								
Scaffolding Instrumentation	**N**														
Electrical *Works*															

Responsible Entity **Activity**	Applicable	Employer	MegChem & Consultants	M&P Contractor	E&I Contractor	Pipe jacking contractor	Civil contractor	Structural Steel contractor	Insulation Contractor	Rigging Contractor	GPR Scanning Contractor	Cathodic Protection			
Strip redundant cables, cable racks, trunking, conduits, etc.	**N**														
Strip redundant electrical equipment, lights, JB's, etc.	**N**														
Install Electrical cables, cable racks, trunking, conduits, etc.	**Y**				X										
Install electrical equipment, lights, JB's, Start stop stations, etc.	**Y**				X										
Lux readings	Y				X										
Trenching for cables	**Y**				X		X								
Install and weld light brackets onto structures and platforms	**Y**				X			X							
Installation of MCC Switchgear buckets	**N**														
Scaffolding Electrical	**N**														
Fire/flame proofing	**N**														
Cathodic protection	**Y**											X			
Structural Steel *Works*															
Structural steel Fabrication	**Y**							X							
Sandblasting & Painting Structural steel	**Y**							X							
Demolishing structural steel	**Y (TBC)**							X							

Responsible Entity **Activity**	Applicable	Employer	MegChem & Consultants	M&P Contractor	E&I Contractor	Pipe jacking contractor	Civil contractor	Structural Steel contractor	Insulation Contractor	Rigging Contractor	GPR Scanning Contractor	Cathodic Protection			
Structural steel Installation	**Y**							X							
Transport redundant material to reclamation yard	**Y**							X							
Scaffolding Structural steel	**Y**							X							
Fireproofing Structural steel	**N**														
Civil *Works*															
Build crane pad	**N**														
Impact testing	**N**														
Earth *works*	**Y**						X								
Concrete *works*	**Y**						X	X							
Pilling	**N**														
Equipment & pipe support foundations	**Y**						X	X							
Fencing	**Y**						X	X							
Scaffolding Civil	**Y**						X								
Demarcation of site establishment areas	**Y**						X								
Sand Cement bedding	**Y**						X								
Site establishment															
Office facilities	**Y**			X											
Ablution facilities	**Y**			X											
Eating facilities	**Y**			X											

Responsible Entity **Activity**	Applicable	Employer	MegChem & Consultants	M&P Contractor	E&I Contractor	Pipe jacking contractor	Civil contractor	Structural Steel contractor	Insulation Contractor	Rigging Contractor	GPR Scanning Contractor	Cathodic Protection			
Locker rooms and changing facilities	**Y**			X											
Shower facilities	**N**														
Trough for washing of hands	**Y**			X											
Drinking water	**Y**			X											
Electrical Power for site establishment for complete site establishment	**Y**			X											
Electrical Power for site work	**Y**			X											
Lights for night shift	**Y**			X											
Connect electrical power for all required DB's	**Y**			X											
Provide cables for electrical power to containers	**Y**			X											

3.4 General – Applicable to all Work Packages

3.4.1 The Contractor must provide his own permit recipient to sign on the permits.

3.4.2 The Contractor completes all required post mechanical / pipe jacking installation activities.

3.4.3 The *Employer* will issue the AFC drawings to the *contractor*.

3.4.4 The *contractor* will fabricate and coat/paint the newly installed items as per the AFC drawings provided by the Employer.

3.4.5 The *contractor* will provide a clear indication of the personnel and equipment allocation.

3.4.6 The *contractor* will provide or procure a rigging team, with suitably skilled personnel, to assist as required during the execution of the *Works*.

3.4.7 The *contractor* will perform wall thickness measurements prior to construction on all areas where piping is to be cut and supply results to the *Employer*.

3.4.8 The *contractor* performs all NDE's / appoints the NDE Contractor for the entire scope of the project. The NDE costs should be allowed for in the *contractor's* bid.

3.4.9 The *contractor* provide temporary supports for all piping that will be disconnected. (where applicable)

3.4.10 *contractor* is to remove any and all scrap material generated throughout the site installation to the ORTIA scrap / reclaimmation yard. Provision to be made for all actions required to achieve this.

3.4.11 Rigging and Cranage required for all activities during removal of existing material that is to be replaced and installation of replacement sections. (inclusive of rigging study).

3.4.12 Sign Certificates of Completion when all *Work* is completed and the client or assigned representative have defected the *works*. Handover shall be done in accordance with ORTIA tenance and engineering protocols.

3.4.13 Mechanical completion (MC) and RFC (The *contractor* is only responsible for his portion of the works required for RFC)

3.4.14 The *contractor* signs Certificates of Completion when all *Work* is complete, and the client have defected and accepted the *works*.

3.4.15 The *contractor* signs MC and RFC. (The *contractor* is only responsible for his portion of the works required for RFC).

3.4.16 The Contractor shall compile and transmit the End of Job (EOJ) documentation for all Work Packs.

3.4.17 The *contractor* completes all post-construction activities.

3.4.18 The Contractor clears the site after the works are completed.

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

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

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

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

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

3.5 *Work* To Be Performed by The *contractor*

3.5.1 Design Phase.

The *contractor* is not responsible for the design.

3.5.2 Procurement Phase

The *contractor* is responsible for the procurement of all material required for the complete 20 inch fuel feeder line replacment as per the requirements of the AFC Drawings.

The *contractor* shall provide all consumables and miscilaneuous items required to do the construction.

3.5.3 Fabrication And Construction Phase

In addition to Sections 3.1 through 3.4, the *contractor* performs:

1. Construction Management
2. Contract Management
3. Safety Management
4. QC Management

3.5.4 Project Close Out Phase

5. The *contractor* shall compile and transmit the Handover documentation in accordance with ACSA tenancy and Engineering specification.

3.6 Constraints To Perform Work

a) Permits to work in the airside and runaway area during normal airport operating hours will be required. No work allowed within 47m from the centre line of the taxiways.

4 Technical Requirements

4.1 General

4.1.1 The Contractor must ensure that all the relevant Employer's specifications and procedures and all governing codes and legislation (e.g. Occupational Health and Safety Act and Regulations) are followed for the execution of the works.

4.1.2 All construction by the Contractor shall conform to all SANS specifications as a minimum.

4.1.3 All fabrication and welding shall conform to all ASME B31.3 specifications and HSE requirements as a minimum.

4.1.4 Two independent geotechnical reports were made available, however, these are not specific to the pipe route but were investigations undertaken for the extension of the tank farm. Geotechnical investigations were conducted in 1998 and 2007, bearing in mind that these were deeper investigations for piling below the proposed tank farm bases.

4.1.4.1 1998 Investigation results

The following typical soil profile has been compiled from the in situ profiling of the 750mm diameter auger hole to a depth of 12,0m and the samples retrieved for depths in excess of 12,0m (up to 24m) as well as the two 400mm diameter auger holes (see photograph numbers 2, 3, 4 and 5).

0 – 3,5m	Red brown, clayey SAND (as comprehensively discussed in the initial report). TRANSPORTED MATERIAL
3,5 – 4,5m	The same as above but with fine gravel and occasional quartzite pebbles/small boulders up to 100mm diameter PEBBLE MARKER
4,5 – 9,0m	Slightly moist, red brown, dense to very dense, clayey SILT COMPLETELY WEATHERED, ANDESITIC VENTERSDORP LAVA
9,0 – 15,0m	Moist to very moist, light red/orange, firm, traces of slickensided surfaces, silty CLAY/clayey SILT COMPLETELY WEATHERED, ANDESITIC VENTERSDORP LAVA

4.1.4.2 **2007 Investigation results (Seismic)**

Site Geology.

The terrain is underlain by Transported soils and possible scattered areas with Pedogenic materials.

The soils are underlain ly by Granite, Quartzite and Shale bedrock.

Quaternary Deposits and Pedogenic Materials.

Various soil types were observed on the site and can be grouped under the following types:

Transported soils.

Pedogenic soils.

Insitu residual soils from weathered bedrock.

4.1.5 **The transported materials.**

The transported soils comprise ly the following soil types:

Sandy to silty CLAY soils with variable amounts of transported pebbles and gravel cover the Granite underlain portion of the study area.

Transported hillwash of clayey SAND to gravely clayey SAND with quartz and Quartzite fragments were observed in the Quartzite area.

Clay Soils containing fragments of Shale within the upper soil strata are present in the Shale area.

Pedogenic Soils:

Pedogenic soils are expected as the result of Ferruginisation of the insitu soils into

Nodular Ferricretes was observed within the transported soil profile overlying the northern Shale band and Granite bedrock. This is thought to be part of the transported soil materials covering the site as a whole.

The Residual Decomposed and re-worked Bedrock Materials.

These soils comprise ly:

Clayey SILT to silty CLAY from decomposed Granite.

Sandy to silty CLAY from decomposed Shale.

Silty Sand with variable amounts of Quartzite fragments to a silty SAND in the Quartzite areas.

4.1.6 It was also noted that results from DPSH tests indicated areas with a higher DPSH count, overlying areas with a lower DPSH count. The water table was encountered at a depth of 10m during the 1998 investigation. Dewatering will not be required, but management and disposal of stormwater collection during the summer months is the responsibility of the Contractor.

4.1.7 It is unknown whether excavated material will be suitable for use as engineered backfill material. However, based on the proposed pipe route being located mostly in the grassed areas, there is no need to remove clayey soils if the area is to be re-grassed.

4.1.8 Allow for the unsuitable material to be dumped at Kempton Park. Four (4) kms freehaul from the South Tanker Gate to be allowed for during pricing. Excavated material, suitable for backfill, to be stockpiled within 2,5km of the South Tanker Gate. Storage site to be identified by ACSA.

4.1.9 All defecting and handover shall be done in accordance with the requirements of ACSA tenance and Engineering.

4.2 Discipline Specific requirements: Civil

4.2.1 The *Contractor* must provide certificates for all materials imported from commercial sources.

4.2.2 Due to space restrictions, excavations must be shored to prevent road closures and impact on the current infrastructure.

4.2.3 The *Contractor* shall stockpile excavated material within 2,5kms, for re-use as backfill. Note that once the invert of the pipe has been excavated, backfilling will occur in sections after pressure testing has been completed and signed off.

4.2.4 The pipeline length is a total of 1760m starting at the Tank Farm tie in point and terminating at existing valve box VCM1. Due to the current routing and jacking of sleeves, it is anticipated that excavation of road layerworks will be avoided for 60% of the installation of the new 20” pipe. Therefore, it is expected that most of the excavated material may be stored and reused.

4.2.5 Where layerworks are encountered: The Contractor, in consultation with the civil engineer, shall determine if layerworks are clearly defined and thick enough to stockpile separately without contamination. A separate item has been allowed in the BoQ for a professionally registered Geotechnical Engineer to evaluate the stockpiled material for use as backfill.

4.2.6 It is anticipated that most of the excavated layerworks and insitu material, will be disposed of off-site.

4.2.7 The current pipe route will follow the route alongside a road before reaching the taxi ways at OR Tambo airport terminal. Excavation is unlikely to impact on road layerworks as the excavations are shored. It is the intention is to jack pipe sleeves below the taxi ways. However, layerworks at taxi ways may be encountered at pipe jacking points, and careful consideration will be given to the placement of pits for jacking operations.

4.2.8 The actual depth and composition of layerworks is below current roads and taxi ways is unknown. It is anticipated that layerworks will extend at least 1m each side beyond surface paving. Every effort shall be made to avoid layerworks.

4.2.9 Although all efforts shall be made to avoid the existing layerworks below the roads, allowance has been made in the BoQ to repair layerworks and asphalt surfaces approximately 1000m2 on plan.

4.2.10 The new pipe shall be supported and levelled on sandbags supplied and installed by the Contractor, placed in the invert of the excavation at 6m c/c.

4.2.11 The top of the sandbags shall be 200mm above the invert of the foundation.

4.2.12 Additional hand excavation under welding points will be required.

4.2.13 700mm wide x 800mm high soilcrete, containing 4% cement minimum, shall be formed around the pipe during the backfilling process. The soilcrete provides protection against damage from future unplanned excavation. It is anticipated that the soilcrete mixture will be formed using the excavated material and conform to SANS 1200 DB clause 3.5 b). PI not exceeding 12, and a minimum CBR of 7.

4.2.14 No allowance has been made for new kerbs and channelling.

4.2.15 No allowance has been made for new road signage.

4.2.16 Allowance has been made to repaint road lines, but only where they are damaged during construction of the new pipeline.

4.2.17 The Contractor shall supply adequate access to the invert of the excavation for the safe passage of employees. This may consist of a scaffolding staircase; however, the structure must always re stable during the excavation process and whilst it res open.

4.2.18 The Contractor must note that GPR (ground penetrating radar) might not detect all services such as water and sewer pipes, electrical cables, fibre optic cables etc. All cables exposed during construction must be treated as live cables. See appendix J for recent GPR scans completed.

4.2.19 No 'free issue' materials will be made available to the Contractor.

4.2.20 The Contractor must acquaint themselves with the following ACSA terminology:

Landside refers to:

• Areas of the airport before the security points; and

• The restricted area beyond the security points but, within the perimeter of gatehouses, passenger terminals and cargo buildings.

Airside refers to:

• The Apron / manoeuvring areas; and

• Areas within the airside boundary/perimeter fence, excluding the internal areas of the passenger terminals, perimeter gatehouses and cargo buildings.

• Fuel Farm Area

4.2.21 The *Contractor* must take cognisance of the difficulties involved with the demolition of VCM0 which is located immediately next to VCM1, and extension of VCM1. See civil drawing of modification required to VCM1 and VCM0.

4.3 Discipline Specific Requirements-Control and Instrumentation

4.3.1 The Contractor provides complete management services, for the supply and execution of the total scope of the works in accordance with this Works Information and Appendices.

4.3.2 The Contractor furnishes all accommodation, transportation, warehousing, storage, craneage, rigging, tools, tackle, plant, equipment, scaffolding, and loop test equipment, consumables and construction materials necessary for the complete execution of the works in accordance with the documentation provided.

4.3.3 The Contractor shall procure all tagged equipment (instrumentation), as specified by MegChem. Inspections and acceptances thereof will be the responsibility of MegChem. The Contractor shall provide storage for all tagged equipment after delivery by Manufacturers/Suppliers thereof.

4.3.4 The Contractor shall appoint both the System Integrators service providers (HIMA and SIEMENS). MegChem will be responsible for providing them with all the relevant documentation to perform their duties and MegChem will also manage them including FAT/SAT activities.

4.3.5 The Contractor carries out all the work for the correct and acceptable installation, testing and handover of all works in accordance with the documentation in the AFC package that will be provided.

4.3.6 The Contractor provides suitably qualified supervisory, installation and technical personnel for the timeous completion of the planning, calibration, installation, inspection, loop check activities. The Contractor ensures that all documents received from the Employer are the most recent issue. Inadequate or out-of-date documents are not accepted as a basis for extra costs.

4.3.7 The Contractor provides instrument testing and loop test equipment, suitably calibrated and certified by an authorized and verified Third Party Inspection Company. Documented validation of equipment shall be provided.

4.3.8 The Contractor provides all labour and equipment required for receiving, unloading, storage, protection, issuing of documentation, re-loading, handling, transporting and other control of all materials and equipment required by the Employer.

4.3.9 The Contractor provides competent planning personnel to facilitate the completion of the Works in accordance with the project schedules.

4.3.10 The Contractor provides the required Certificates of Compliance for all instrument installations (i.e. all instrument loops as well as basic power supplies etc.)

4.3.11 All materials proposed by the Contractor for incorporation into the work shall where required, be tested in accordance with the specification. All test results shall be submitted to the Employer for approval prior to such materials being built into the works. No material shall be built into the works without such approval. All costs involved in this testing shall be deemed to be included in the rates tendered.

4.3.12 The Contractor is totally responsible for the implementation of an approved QA system.

4.3.13 The system shall be submitted to the Employer for approval within 14 days of the start of the Contract and shall define methods to ensure that all necessary quality standards are attained. The Employer will audit the applications of the QA system on a regular basis during this Contract.

4.3.14 All plant equipment provided by the Contractor for the execution and tenance of the works shall be of a character comparable with the scope of the works.

4.3.15 The Contractor shall provide and tain sufficient plant equipment to meet all contractual requirements and shall not remove any of this plant equipment from the site without the written permission of the Employer. The Contractor shall, however, remove unsuitable, obsolete or worn-out plant equipment from the site when ordered to do so by the Employer.

4.3.16 The Contractor shall notify the Employer of all inspections of equipment/works. The approval of any equipment/works on the site by the Employer shall in no way relieve the Contractor of any of his obligations under the Contract.

4.4 Welding Requirements

4.4.1 All welds, including tack and fit-up welds, shall be done according to approved procedures with appropriate filler materials, utilising only certified welders.

4.4.2 Welding areas on site to be 50 to 75 micron from internal coating as per CPS 06 coating and lining requirements.

4.4.3 PQR, WPS and WPQR shall be qualified according to BS EN ISO 15614 Part 1, 2017 Add 2019 Level 1, for all manufacturing processes. All PQR and WPS shall be submitted to the *Contractors Agent* for review.

4.4.4 Existing WPS/PQR, or parts thereof, may be acceptable provided all requirements for re-use are satisfied. Any changes in the essential variables shall require re-qualification.

4.4.5 Each WPS shall contain the essential variables and information required by BS EN ISO 15614 Part 1, QW-250, as well as the following:

- For filler metal(s), the specific manufacturer(s) and trade name(s) to be used in production.
- Details of tack welding technique (where applicable).

4.4.6 All pressure retaining welds shall be full penetration welds.

4.4.7 All welding areas must be free from contaminants before welding is carried out as this may lead to porosity or preferential corrosion.

4.4.8 Before any welding takes place, all weld bevels shall be visually inspected internally and externally for nicks, dents, general damage, or other surface defects and PT/MT as applicable shall be performed on weld bevels as per the approved mechanical drawings. Defects shall be dealt with as stated below, after which, the final cleaning prior to welding shall take place.

4.4.9 Any small burrs, nicks, or other irregularities on the weld bevel shall be repaired, if possible, by light grinding. Any suspected edge defects or laminations shall be reported to the contractor before

proceeding with investigation or repairs. Repairs by welding shall not proceed without prior approval by the Employer.

4.4.10 Where welds are ground, the weld size and plate shall meet the minimum design requirements after finishing.

4.4.11 Remove all sharp edges. Surfaces in contact with the process streams shall be free from indentations, stamping, identification markings or scratches.

4.4.12 Undercuts are not permitted.

4.5 Tolerances

All fit-up weld preps and mechanical engineering activities to be inspected by the inspection body and the *Contractor* designated engineering inspection personnel prior to commencement of welding and final fit.

4.6 Defects

1. Defects in any material shall not be repaired by welding without the prior written approval by the Employer and the concurrence of the inspection body for each specific case.

4.7 Surface treatment

2. All Equipment shall be thoroughly cleaned inside and outside, and shall be free of grease, weld spatter, scale, slag, and all other foreign matter.
3. All lining and protective coatings to be tested according to SANS 1217 MEK procedures, contractor to ensure site weld areas are adequately lined prior to end capping of piping after each shift.

5 Working with the *Employer*, *Contractor,* and *Others*

5.1 Working with *Others*

5.1.1 The *Employer* has other Contractors that are also performing other work on site (*Others*). The *Contractor* must manage his/her interfacing with the *Employer* and the *Others (*Contractors*)* such that there is no standing time for either Party.

5.1.2 Co-ordination is required with ACSA as the area may be congested by *Others* as well as *Employers* operations or tenance personnel. It is however required that the *Contractor* manage his/her interfacing with *Others*.

5.2 Compliance with Codes and Standards

5.2.1 The *Contractor's* Temporary *works* design shall comply with the (latest edition) SANS codes and international standards stated below, and/or in the Scope and Good Engineering and Construction Practices. To the extent not stated, the Designs comply with internationally recognised codes and standards which are accepted by the Employer. In case of conflict between national, international codes, standards or guidelines and/or the requirements specified in this

Scope, and unless otherwise instructed by the *Employer*, the more onerous one takes precedence; provided always that the *works* comply as a minimum and in any event, with applicable law and mandatory South African national codes, standards and guidelines.

5.2.2 The minimum ACSA requirements for all disciplines are;

5.2.3 The requirements of the Occupational Health and Safety Act No. 85 of 1993 and Construction Regulations 2003.

5.2.4 Legislation By-Laws and Regulations applicable to the area within which the project falls.

5.2.4.1 The code of practice for the Application of the National Buildings Regulations, (SANS 10400).

5.2.4.2 JIG Guidelines for Aviation Fuel Quality Control and Operating Procedures.

5.2.4.3 The ATEX directives; (The Regulations apply to al/ equipment intended for use in explosive atmospheres, whether electrical or mechanical, and to protective systems)

5.2.4.4 The requirements of the IEC 61508 and IEC 6151 1 standards for functional safety of electrical/electronic/programmable electronic safety-related systems; (SIL3 Certification) the recommendations API / El Aviation Fuel Handling Equipment Standards and Recommended Practices (15xx) and all standards referenced or contained in their Annexures; (unless there are more onerous requirements stated elsewhere)

5.2.4.5 The recommendations of OIML.

5.2.4.6 The requirements of SANS 10089 parts 1 and 2.

5.2.4.7 The requirements of SANS 347.

5.2.4.8 The requirements of API and ASME standards for valves, flanges, gaskets, tanks, vessels, welding,

5.2.4.9 Pumps, piping and other appurtenances, e.g. API 6D, 6FA, 610, 2000, 650, 651, 652, 653, etc. and

5.2.4.10 ASME B16.xx, Vil, 831 .3, 831 .4, etc.

5.2.4.11 The requirements and recommendations of the NFPA standards and codes for fire protection and fire

5.2.4.12 Safety, e.g. NFPA 10, 1 1, 13, 15, 16, 20, 22, 24, 30, etc.

5.2.4.13 The requirements of the COLTO Standards, SANS 1921 and SANS 2001 for roads and civil engineering.

5.2.3 The recommendations contained within or made by international and national standards are viewed as the benchmark for Good Engineering and Construction Practices and shall be complied with, unless it can be demonstrated that it is not practicable.

5.2.4 Good Engineering and Construction Practices are the relevant practices, standards, recommendations, methods, procedures and acts used internationally by skilled contractors engaged in the design, engineering, construction, testing and commissioning of work similar in nature and extent to the *works* that, at a particular time, with the exercise of reasonable judgment, care, attention in light of the facts known or that reasonably should have been known to the party making a decision at the time a decision is or should be made, would be expected to accomplish the desired result in a manner consistent with Laws, reliability, safety, environmental protection, economy and expedition.

5.2.5 With respect to the plant and the *works*, Good Engineering and Construction Practices include taking reasonable steps to ensure that:

- Adequate materials, resources and supplies are available to undertake the *works* under normal conditions.
- Sufficient engineering, design, construction and safety personnel are available and are adequately experienced and trained to design, construct and test the *work*s properly, efficiently and within applicable Laws, manufacturer's guidelines and specifications and API and El standards and recommendations.
- Appropriate monitoring and testing are done during the design, manufacturing, erection and commissioning to ensure that the *works* are constructed to the required standards, tolerances and specifications and that equipment is functioning as designed and to provide assurance that it will function properly under normal conditions.
- Appropriate protective devices and design features are provided to ensure that safe, reliable, long-term operation of the plant can be achieved, if operated and tained in accordance with the Operation and tenance Manual.

6 Access dates, Take over, Key dates, Working Times, Sectional completion, Completion

6.1 Access dates

Define the access to site to perform work.

Access site	• 17 June 2025 • Access to site will only be allowed once the necessary permits are obtained.
Site establishment	• Site establishment on airside will only be permitted with the accompaniment of an escort, if permits have not been received.
Construction starts (receive permit)	• When all the equipment the Contractor will work on is offline and safe. • When the contractors safety file has been approved. • When the contractors staff have completed the necessary induction courses and permits have been issued by ACSA. • When all vehicles and plant that the contractor will use has passed ACSA tests to receive a permit.

6.2 Take Over of The *Works*

6.2.1. Handover is not an event but a process that needs to be properly planned.

6.2.2. QC and handover documentation must be accepted by ACSA at the end of construction. The type and format of the handover must be agreed during construction latest revision of the *Employer*'s handover certificates are available on request.

6.2.3. Handover and acceptance is dealt with on a discipline basis, , with the total works being subject to Handover / Acceptance Certificates signifying completion. It is critical that the contractor gets approval of his handover strategy by the Project manager, Commissioning Manager and the Plant Owner as early as possible when construction starts to ensure no delays happen during handover. Hold and witness points must be clearly understood and incorporated into the construction schedule.

6.2.4. The *contractor* performs pre-defects on items before handover to the employer.

6.2.5. The *contractor* attends to all defect items to meet construction completion and handover milestone requirements as specified in his construction schedule. Adequate time for the handover process (defecting, rework, back defecting, loop checks and signing of documentation) needs to be indicated in the construction schedule.

6.2.6. Completion requires that all the defect items for each discipline have been corrected.

6.2.7. Inputs will be required from the contractor for the PSSR (process safety file) and certain business readiness deliverables (operating guidelines). Take note of the documentation and timeline required below.

6.2.8. *Employer* Projects designated QA/QC disciplines participates in final approval of the plants/installations.

6.3 Working Times

Working times are planned as follows (the Project team and Employer can agree to work shifts when and where the schedule require, the work times will collectively be adjusted as agreed, final duration and working days to be confirmed in bid).

6.3.1 Pre-construction work:

6.3.1.1 5 working days (Monday to Friday 7:30am – 4:30pm)

6.3.2 Construction phase:

6.3.1.2 5 working days (Monday to Friday 7:30am – 4:30pm)

Office activities / Support services (7:30am – 4:30pm):

6.3.1.3 5 working days (Monday to Friday)

NB The above working hours are subject to change based on the operational requirements of the employer.

6.4 Completion

Completion is achieved when:

6.4.1 The *work* has been completed according to the requirements in the Works Information.

6.4.2 All surplus materials have been removed from site.

6.4.3 The *contractor* has completed cleaning and the removal of debris from the Site.

6.4.4 All outstanding defect and exception items have been complete and signed off.

6.4.4 The EOJ documentation is received and accepted by the *Client*.

6.4.5 Red-lined drawings indicating as-built dimensions are received by the Project Manager.

6.4.6 All “end of job” documents, to be supplied by the *Contractor*, has been accepted by the *Project Manager* and handed over.

6.4.7 Upon satisfaction of the above the *Project Manager* issues a completion certificate.

6.4.8 Site Establishment has been cleared off-site.

7. General constraints and requirements on how the *Contractor* provides the *Works.*

7.1. Access

6.1.1. No access is allowed without the necessary permits.

6.1.2. No work is allowed on the taxiways when planes are crossing.

6.1.3. There may be window periods communicated by ACSA when work will only be allowed on taxiways

6.1.4. Work is not permitted within 45m of a taxiway center line while an aircraft is crossing

6.1.5. NDT must be performed at agreed times and must be communicated to all affected personal at ACSA.

7.2. General

7.2.1. If applicable: The required cover of suitable flameproof material for cocooning needs to be provided by the *Contractors* for the safe closure of scaffolding during welding, grinding and cutting work.

7.2.2. If applicable: All electrical equipment needs to be inspected prior to use by the *Employer’s* electrical department.

7.2.3. Permits must be obtained for the *works* prior to starting the *works.*

7.2.4. The *Contractors* is responsible for providing his own communication on site. Note that there are limitations on cell phones and two-way radios. See **7.11.3**.

7.3. Special PPE requirements

7.3.1. The *Contractors* is to supply and provide *Contractor*’s employees with the required PPE. Standard civil construction PPE is required to perform the work, unless stipulated otherwise on the work permit.

7.4. Shipment of *Contractor’s* supplied Equipment, Plant and Materials.

7.4.1. The *Contractor* arranges all shipments of Plant, Materials and Equipment to the Site and consigns all such shipments to himself as consignee at the project shipping address, freight fully prepaid. The *Contractor* makes demurrage agreements and settlements with carriers for his shipments.

7.4.2. The *Contractor* advises the *Project Manager* in advance of all major shipments of Plant, Materials and Equipment and co-ordinates with the *ACSA entry gates,* the arrival, unloading and release of such. The *Contractor* promptly unloads its shipments and promptly releases the carrier's equipment.

7.4.3. The C*ontractor* notifies the *Project Manager* of being unable to promptly unload any shipment not less than 10 (ten) days prior to arrival. The *Contractor*, at his discretion, unloads or makes arrangement for *Others* to unload such shipments for his account.

7.5. Protection and control of Plant, Materials and Equipment

7.5.1. At all times provides protection for all Plant, Materials and Equipment from damage or loss due to weather, fire, theft, unexplained disappearance or other similar casualty.

7.5.2. At all times, protects from damage due to the *Contractor'*s Provision of the *works*, all Plant, Materials and Equipment, paving, structures and all items on the Site that is the property of the *Employer* or *Others*.

7.6. Temporary installations

7.6.1. The *Contractor* supplies, installs, tains and removes all temporary construction facilities and utilities necessary to provide the *works*.

7.6.2. The *Contractor* takes note and submit the following details of the type of facilities the *Contractor* intends to bring to site, the commencement and completion dates and the locations within the site to the *Project Manager* for acceptance:

- Standard temporary buildings including offices, warehouses, change rooms, reinforcing fabrication facilities, concrete mixing facilities, form work storage facilities.
- Establishment and tenance of the Site.
- Arrangements for accommodation and feeding of the *Contractor*'s personnel.
- Communications facilities.
- First aid facilities and firefighting equipment.
- Ablution Facilties.
- Securing the entire *Contractor*'s equipment inside *Employer's* secondary security area.
- Parking facilities on-site.
- Temporary lighting.
- Fuels and lubricants.
- Temporary expendable or consumable construction items and supplies.
- Temporary electrical power and reticulation (permanent power supply cannot be guaranteed).
- Dewatering equipment.
- Test equipment required for testing and sampling.
- Construction and potable water at points near the job site as designated by the *Employer*.
- Connections to and disconnection from water supply are to be supplied by the *Contractor*.

- Transport facilities on and off site.
- Water draw-off and drain valves and all fittings for disposal of test water.
- Electrical construction panel and distribution wiring; Connections to, and connections from, the power source will be by the *Contractor*.
- Lab equipment.
- tenance of the *Contractor*'s lay-down, storage and work areas and roads within such areas.
- All non-destructive testing equipment; and,
- All small tools and equipment required to perform the work.

7.6.3. The locations and layout on Site are subject to and in accordance with the review and acceptance by the *Project Manager*. No changes to the layout are allowed without prior approval from the *Project Manager*.

7.6.4. The *Contractor* provides adequate ablution facilities within the Site for his/her employees conforming to the minimum requirements as stipulated in the OHS Act. The *Contractor* maintains the facilities in a sanitary and safe condition. The *Employer's* and *Contractor's* safety officers may inspect the site and facilities for compliance with these requirements at any time.

7.6.5. The *Contractor* provides and maintains first aid facilities within the Site.

7.6.6. The *Contractor* maintains the site and ensures proper housekeeping is always executed from the date of site establishment to demobilization. The *Contractor* is to ensure all access roads are kept in a safe and workable condition.

7.7. Site services procedures

7.7.1. Existing Services

7.7.1.1. The *Employer* has specific Site services and procedures. The *Contractors* shall ensure that all *Contractors*' employees, *Contractor*'s suppliers comply with these procedures.

7.7.1.2. All *Contractors* staff entering the ACSA site attend induction training.

7.7.1.3. All requests for excavation permit (e.g. for cable clearance requests or pipe exposures) are made one week in advance.

7.7.1.4. The *Contractor* identifies and protects all existing services. The existing services are marked on site with markers and chevron danger tape as applicable. Any damage to existing services is reported to the *Employer* immediately and is repaired by the *Contractor*. Where the *Contractor* cannot do this work, the *Employer* repairs the damage on behalf of the *Contractor*. The *Contractor* res responsible for the costs associated with the damage repairs.

7.7.2. Equipment, Plant and Materials

7.7.2.1. The *Contractor* inventories all equipment, plant and materials entering the Working Area on the prescribed forms obtainable from the *Employer's* security. The original inventory is retained by security and the *Contractors* retains a duplicate copy of the inventory. The *Contractor* updates the inventories as required by the *Employer*.

7.7.2.2. All equipment brought into the site by the *Contractor* is clearly marked and is not removed from the working area unless the *Contractor* identifies it as his/her property and the *Project Manager* has accepted the removal.

7.7.2.3. All equipment, plant and material brought into the site are to be clearly consigned to the *Contractor*. The *Project Manager* first accepts the removal of any excess plant and materials and waste.

7.8. Security Requirements

7.8.1. General

7.8.1.1. ACSA security maintains discipline on roads within the area. The *Contractor* to ensure adherence to the road traffic offences within the ACSA premises.

7.8.1.2. The *Contractor* does not permit personnel who are under the influence of drugs or alcohol to enter the working area. The Security may, at their own discretion, have a person tested. The *Contractor* bears the costs for positive testing. The tariffs for these tests are obtained from the *Employer's* medical station.

7.8.1.3. Further information regarding security requirements is available from the following person:

Name	:	ORTIA ACSA Security
Telephone	:	+27 11 921 6200
E-mail	:	SecurityOperationsORTIA@airports.co.za

7.8.2. Entry

7.8.2.1. The *Contractor* obtains entry permits that are issued free of charge by security upon submission of the employee's permit, subject to *Employer's* applicable rules.

7.8.2.2. The *Contractor* undertakes always to be in possession of an permit, worn so that identification can be made immediately. The *Contractor* consents the *Employer's* security searching and inspecting property entering or reing within the area.

7.8.2.3. The *Employer* requires a security clearance of all persons entering the area. The *Contractor* applies for the security clearance of its personnel timeously. Detailed requirements for security clearances and procedures for the issue of permits are available from the offices. Temporary permits are only issued by security in cases of emergency break stops.

7.8.2.4. When a *contractor's* employee is no longer required on the site, or in cases where an employee leaves the employment of the *Contractor*, the *Contractor* is responsible for the recovery and delivery of the entry permits to the *Employer's* Security department for immediate cancellation prior to any employee leaving the site. The cancellation receipts are issued upon the return of the permits.

7.8.2.5. If the Completion Date is extended, the *Contractor* arranges with the *Employer* for an extension of the entry permits and updating of records.

7.8.3. Vehicles

7.8.3.1. Access into the working area by the *Contractor"* vehicles is controlled by security.

7.8.3.2. *Contractor* to provide transportation for his employees to different site locations in the ACSA security area.

7.8.3.3. The *Contractor* compiles, in consultation with the *Employer's* official responsible for the *works*, a vehicle registration list that reflects the type, make and registration particulars of the vehicle and submits the form to security for acceptance and registration, prior to the date of commencement of the *works*.

7.8.3.4. The *Employer's* security personnel have authority to stop and search vehicles and personnel at their discretion. The *Contractor* advises all his/her employees and S*ubcontractors* accordingly.

7.8.3.5. The *Contractor's* supplier's drivers identify themselves by means of a valid identity document and produce a delivery note addressed to the *Contractor*. The responsible *Employer's* official signs in the supplier's vehicle and its occupants, escorts them to the working areas, escorts them out after the delivery, and signs out the supplier's vehicle and its occupants.

7.8.3.6. Security searches and inspects all vehicles and their contents entering and leaving the area.

7.9. Subcontracting

7.9.1. *Contractor* at all times only utilizes approved ACSA vendors for the execution of the *works.* The *Contractor* submits all proposed *Subcontractors* to the *Employer* for acceptance. *Contractor* submits and complies with the following:

- A list of the proposed *Subcontractors*
- A statement of any *works* that should not be subcontracted.
- A statement of any *works* that is required to be subcontracted.
- Details of any restrictions applicable in the use of labour, or preference for utilization of Small, Medium and Macro Enterprises, Black Economic Empowered Enterprises, Black Woman Owned Enterprises, etc.

7.9.2. It is important to take any preplanned shutdown dates of the *Employer's* works into consideration.

7.9.3. All *Contractors* are appointed on a back-to-back basis in accordance with the NEC Engineering Construction Contract

7.10. Permits

7.10.1. Permits

7.10.1.1. The *Contractor*'s responsible person appointed in terms of the OHS Act receives permit training, from the *Employer*, before the *Contractors* starts any work.

7.10.1.2. The *Contractor* shall familiarize himself with ACSA's safety and security requirements relating to permits to prevent any unnecessary work delay.

7.10.1.3. The *Contractor* shall have no claim against ACSA in the event that a permit request is refused.

Permit	Required by/for	Department

AVOP – Airside Vehicle Operator permit	All drivers of vehicles on airside	ACSA Safety
Airside Vehicle Permit	All vehicles that enter airside	ACSA Safety
Basement Parking Permit	All vehicles allowed to enter the delivery basement	ACSA Parking
Personal Permit	All persons employed on the airport	ACSA Security
Cell Phone Permit	All persons taking cell phones to airside	ACSA Security
Tools & Laptop Permit	All persons taking tools and laptop to airside	ACSA Security
Camera Permit	All persons taking camera equipment to airside	ACSA Security
Hot Works Permit	All welding and/metal cutting work on the airside	ACSA Safety
Airside Projects/Works Permit	For all projects on the airside	ACSA Airport Operations / Safety
Low/Medium Voltage Permit to Work	For all work on substations, distribution boards and cables	ACSA Electrical tenance

7.10.2. Excavation permits (if applicable)

7.10.2.1. The *Contractor* arranges for excavation permits for each excavation in a specific area with the *Employer.*

7.10.2.2. The *Contractor* does not commence any excavation without the necessary permits and the prior acceptance by the *Employer*.

7.10.3. Other Requirements

7.10.3.1. Proof of having attended the Airside Induction Training course is required for all personal permit applications.

7.10.3.2. Fees are levied for these courses. Fees are further levied for all permit renewals and refresher courses where applicable.

7.10.3.3. The use of cell phones is not permitted unless the user is in possession of an appropriate Airport permit for the device.

7.10.3.4. Cell phone permit issuing authority lies with the ACSA Security department.

7.10.3.5. The *Contractor* will not be allowed to use two-way radios at the Airport unless these radios are of the type, model and frequency range as approved by the ACSA IT department.

7.10.3.6. Approved radios may be arranged via ACSA IT department – payment will be for the account of the *Contractor.*

8. Quality Control (TBC by Employer) – (ISO 9001 system in place)

1. The *Contractor's* appointed QC manager submits a Quality Control Plan for the fabrication of his/her Plant and Materials to the *Supervisor* for acceptance at least 15 working days before work commences.

2. *Contractor's* Quality Assurance Department / *Supervisor's* Quality Assurance Department / Third Party Authority will review the documentation and mark the required hold and witness points on the QCP and give the documentation a status based on compliance to the requirements. Once all documentation is on B-approval, the C*ontractor* must arrange a pre-manufacturing meeting. The *Contractor* will chair the meeting.

3. No fabrication is permitted to commence without a pre-manufacturing meeting and all fabrication documentation having at least “B” approval status from the *Contractor’s* Quality Assurance Department / *Supervisor’s* Quality Assurance Department / Third Party Authority.

Plant and Materials are subject to inspection and/or test by a representative of the *Supervisor’s* Quality Assurance Department who is to be granted access to all parts of the Contractor’s premises engaged in the manufacture or processing of this contract. Rejections by the representative of the *Supervisor* are considered as sufficient cause when referred to drawings/specifications and/or data sheets as applicable to this contract.

Third Party Authority Inspection (AIA) is required for pressure bearing equipment as per Pressure Equipment Regulation (PER) Component parts pertaining to pressure envelopes are to be inspected at source of manufacture by the Third-Party Authority.

Resolution of engineering problems directly with the Third-Party Authority is prohibited. All engineering problems are to be addressed, along with proposed solutions, to the *Supervisor* for resolution.

The *Contractor* notifies the *Supervisor’s* Quality Assurance Department / *Employer’s* Quality Assurance Department / Third Party Authority at least two (2) working days in advance of the date inspections can be made. If, for any reason, the inspection date should be set back, the *Contractor* notifies the *Supervisor’s* Quality Assurance Department / *Employer’s* Quality Assurance Department / Third Party Authority immediately.

The *Contractor* facilitates inspections by furnishing to the Supervisor(s) copies of specified certifications for material, test data, etc., to enable verification of compliance with requirements. This does not relieve the C*ontractor* of the requirement to submit this information to th*e Supervisor*.

Plant and Materials for this contract is not shipped by the *Contractor* until it has been inspected and released for shipment, unless prior approval has been granted by the *Supervisor.* Proof of inspection release, or approval to deviate, accompanies shipment documents.

Release of Plant and Material for shipment does not relieve the *Contractor* of any responsibility or guarantee as mutually agreed in the Contract. Acceptance of shop tests does not constitute a waiver of field performance requirements under specified operating conditions, nor does shop inspection by the *Supervisor* relieve the *Contractor* of any responsibilities in case of late discovery of defective Plant, Material, and/ or workmanship.

The *Contractor* records Defects, with the following information included:

- A reference number for each Defect
- A basis to reference each Defect
- The name of the person who identified the Defect
- The category of the Defect
- The sign off the corrected Defect by the *Contractor* and the *Project Manager*

The Contractor shall ensure that all documentation (QC, Safety and Planning) is in place and approved by the Supervisor and/or ACSA.

9. SHER

9.1. Safety, Risk Management

1. The *Contractor* shall ensure that all work performed adheres to the highest standards of Health and Safety requirements.

The *Contractor* shall comply with the required *Employers Site-Specific Health and Safety* specifications, Procedures relating to Health and Safety compliance, Construction Regulations 2014 as well as the Occupational Health and Safety Act 85 of 1993 and all its applicable Regulations.

9.2. Employer Safety, Health and Environment Requirement

- The *Contractor* complies with all legal requirements, the *Employer*'s SHE specifications as well as the operations site-specific policies, standards, codes, procedures, health and safety rules, whilst working on the Site.
- The *Contractor* complies with all requirements as stated in this Works Information and attachments hereto.
- The *Contractor* performs the *works* safely as per the requirements of the Works Information.
- The Contractor must provide a complete SHE file to the Construction Health and Safety Agent, at least fourteen (14) days prior to commencement of works to ensure compliance to ACSA and legislative requirements. The file shall be a hard copy and a soft copy. Documents to be submitted include the following but are not limited to the list below, a contractor SHE File index contains a complete list of requirements:
    - Signed Section 37 (2) Mandatary Agreement;
    - Valid Letter of Good Standing;
    - Signed OHS Specification;
    - Method Statement/s;
    - Project Specific SHE Plan;
    - Fall protection and rescue plan where applicable;
    - Lifting plan where applicable;
    - Valid Medical fitness certificates as per Annexure 3 of the CR 2014 regulations;
    - Activity specific risk assessment (Safety and environmental impacts and aspects);
    - SHE Appointee structure (organogram);
    - Applicable Letters of appointment;
    - Proof of competencies (competency certificates);
    - Construction Work Permit;
- Service & tenance Contractors Environmental Terms and Conditions to Commence Work - EMS 048; and

- Airside Safety Plan.
- Prior to commencing the construction work, the *Contractor* submits the plans for Equipment tenance, security and dust control at the site to the *Client* for acceptance and complies with such plans as accepted by *Client.*
- Airside is a NOISE ZONE, NIHL regulations shall apply. All persons must wear noise protection equipment and high visibility vest and safety shoes at all times.
- The following items are prohibited from the airport:
    - Weapons;
    - Taking photographs with prior approval;
    - Smoking in undesignated areas;
    - Alcohol and drugs;
    - Nonprescription drugs and banned substances;
    - Mobile phones in high risk areas such as explosive and high voltage areas, etc.
- Contractor(s) performing hot work like welding, flame cutting, soldering, and similar operations must request a permit from Fire and Rescue Department prior to commencing with hot work.

9.3. Legal Appointments

1. The Contractor shall appoint designated competent employees and/or other competent persons as required by the Act and Regulations. The legal appointments must be used to select the appropriate appointments for the 20'' Fuel Feeder Line Replacement at O.R Tambo International Airport project.
2. It is to be noted that these appointments are based on the proposed scope of works at the time of drafting of this works information. Should the scope of work or activities on the project change at any given time, legal appointments together with competency requirements required for such change in scope or additional activities will be communicated to the Principal Contractor and such appointment must be implemented by the Principal Contractor with immediate effect..
3. The Contractor warrants that his employees all have the professional and technical expertise, the qualifications, and legal appointments, competencies and skills and the appropriate equipment, tools, resources, facilities, licenses and permits to perform its obligations.
4. The Contractor must ensure that the Construction Health and Safety Officer are registered with the South Africa Council for Project and Construction Management Professions (SACPCMP) and he/she has the necessary competencies. This resource must be full time on site.

9.4. Application For Construction Work Permit

1. The *Contractor* shall cooperate with the *Project Manager* in the provision of the necessary documentation in compliance with the requirement for application for a permit to do construction work..

9.5. Construction Pre-Qualifications

1. The *Client* will conduct a pre-qualification assessment of the *Contractor's SHE File prior to commencing with the works. The* Contractor must also review and approve his sub contractors SHE Files prior to commencement of any works by the appointed Contractor/s.
2. The Contractor is directly responsible for all sub contractors they appoint onto the project and shall ensure that these Contractor/s has competencies and resources to work safely;
3. The sub contractor shall be subjected to SHE file approval process by the Contractor according to the Contractor's own OHS and Environmental requirements including those of the Client;
4. Once the Contractor has approved the sub contractors SHE File, a letter depicting vetting and approval done by the Contractor shall be submitted to Client prior to work commencing. Proof of audits conducted are to be included in the safety file for audits with the Company; and
5. The Contractor would be required to sign a Section (32) Agreement with its sub contractors and a copy shall be kept on the Contractor and the appointed Contractor's SHE File.

The *Contractor* with reference to the *works* to be performed verifies the *sub contractor's* resource capacity, employee qualifications and competence required to Provide the Works.

Prior to commencing the construction work, the *contractor* submits and each of his/her sub contractors who qualify as a Principal contractor as defined by the OHS Act, submits its relevant Construction SHE plans with minimum requirements as per ACSA requirements.

9.6. Risk Management

1. The *Employer's* project specific baseline risk assessment is provided.
2. The *Contractor* does not perform / service / work before undertaking a Method Statement and Task Risk Assessment of the site and work / service to be performed and obtaining a Permit to Work from the *Employer*. The risk assessment and control measures to be taken by the *contractors* are to be reviewed by the *Client* and an agreement must be reached on communication and co-operation requirements.
3. The *Contractor must* submit to the *Client* a project specific baseline constructability review / risk assessment and risk mitigation plan for the *works.*
4. The *Contractor* has his/her own employee(s) trained to sign-on and sign-off of permits to work (permit recipient).

9.7. Monthly Reporting

The Contractor shall be responsible for reporting on the project OHS performance monthly, the report shall be sent to the Client before the 4th of every month for the duration of the project until the sign off.

The report shall be on the Project Monthly Report Template – OHS 039.

The report shall be tabled on the project progress meeting to monitor OHS performance and to enable decision making on OHS aspects.

9.8. Reporting of Incidents

1. The *contractor* immediately contacts the *Client* to report the following incidents mentioned below:
    - Near misses.
    - Any incident/accident or injury that may have a significant impact on the project or adjacent plants.
    - Any occupational injuries and illnesses on Site (fatal cases, lost workday cases, restricted work cases, medical treatment cases, first-aid cases and section 24 incidents).
    - All visits from Department of Labour, any condition that may endanger the adjacent and surrounding plants and any condition that may endanger the construction activities.
        - All reportable incidents as required in terms of Section 24 of the Occupational Health and Safety Act 85 of 1993 must also be reported; The Section 24 incidents shall be reported to the Provincial Director of the Department of Employment and Labour within seven days and at the same time to the Client or its Agent where an employee is injured on duty to the extent that he/she:
            - Dies;
            - becomes unconscious;
            - loses a limb or part of a limb;
            - is injured or becomes ill to such a degree that he/she is likely either to die or to suffer a permanent physical defect or likely to be unable for a period of at least 14 days either to work or continue with the activity for which he/she was usually employed.
            - a major incident occurred;
            - the health or safety of any person was endangered (this could be a near miss);
            - where a dangerous substance was spilled;
            - the uncontrolled release of any substance under pressure took place;
            - machinery or any part of machinery fractured or failed resulting in flying, falling or uncontrolled moving objects; and
            - machinery ran out of control.
    - Any occupational health or hygiene incidents other than illnesses; and
    - Any damage caused to the property or environment.

The *Contractor* shall comply with the ***Employer's*** requirements with regards to incident management. The requirements are set out in the incident management toolkit and will be issued to the *Contractor* after contract award.

Only injuries which are classified as project related is accepted and recorded for statistical purposes.

9.9. Behavioural Based Safety (BBS)

1. The *Contractor* ensure that a behaviour-based safety system is implemented on all project in line with the specified principles and BBS essential requirements..

The *Contractor* understands the consequences of deviating from expected SHE behaviours. Deviations from expected SHE behaviours are managed according to the disciplinary codes with due consideration for distinguishing between mistakes and violations.

The *Contractor* participates and ensures leadership is enabled to enhance safety engagement and climate through the behaviour transformation interventions from the *Contractor*, to achieve and sustain zero harm.

9.10. Permits

9.10.1. Permits (RSA)

1. The *Contractor* 's responsible person appointed in terms of the OHS Act receives permit training, from the *Employer*, before the *Contractor* starts any work.

9.10.2. Daily Work Permits for Operating Area

1. The C*ontractor* is not allowed to perform any work without the necessary official work permit, as issued by the *Employer*.

Upon approval of the SHE files, the Client shall coordinate a session to be held onsite where work is to be carried out to conduct an assessment in order to issue an Permit to Work – M&E 070 to the contractor;

• The issuer of the permit shall also facilitate necessary signatures required to authorize the contractor to commence with Works on Aerodrome - V010 005M prior to start of work;

• The Permit to Work (PTW) shall be issued per site and per scope of work. The Client Project Manager shall notify Clients OHS Department if the scope of the contractor is changing in order for the new permit to be issued; and

• For all fixed term contractors, a permit to work shall be issued to a contractor and the permit shall be valid for one (1) year from the date of issue. A new PTW can only be issued upon review of safety file.

9.10.3. Excavation Permits

1. The *Contractor* arranges for excavation permits for each excavation in a specific area with the Client,
2. It must be noted that excavation works is deemed as a high-risk activity. Any noted deviations will be addressed with the relevant Contracts/Project Manager. Failure to comply shall result in notice being issued to the contractor via the Contracts Manager to highlight the need to comply within seven (7) days as per the contract.

The *Contractor* does not commence any excavation without the necessary permits and the prior acceptance by the *Project Manager*.

10 Planning and Reporting

10.1 Project Programme

10.1.1 First Programme for Acceptance

1. *Contractor* will submit a level 3 programme for acceptance.

The *contractor* must compile and submit the Basis of Program narrative for acceptance.

The Basis of Program narrative document must be provided that show the following:

- Project Description & Information
- Schedule Process Summary
- Project WBS
- Productivity Norms; Assumptions & Key Resources and Quantities
- Project Schedule Opportunities & Risks
  - Calendars Working hours & days
  - Holidays (Public Holidays & December periods)
- Schedule Integrity
- Key Project Milestone Dates
- Critical Activities
- Schedule Reserve & float
- Updating & Reporting

In the development of the level 3 schedule, the *contractor* identifies the critical path which considers inter alia the construction activities and all interfaces with Other *Contractors* and Vendors.

This programme must show all contractual dates, major activities per phase and other milestone dates

The first program for acceptance is a Gant Chart with logical links indicating the start and completion dates for each activity as well as the critical path. It is a summation of the schedules of lower levels.

The programme must be submitted in MS Project Format

10.1.2 Requirements of revisions to the Programme

1. The first revised program must be at least a level 4 programme and is the basis for project control and progress measurement by overall histograms and progress curves and should be issued 2 weeks post award.
2. If the Basis of Program changes in the revised program, then the updated Basis of Program narrative document must be submitted with the revised program.

The level 4 programme is linked to the cost control system for cash flow monitoring and forecasting. All schedule reporting reflects current planning against the level 4 schedule.

Resources are uploaded on the level 4 schedule. In the process of resource loading technical constraints, availability of resources in the region, quality of resources and performance factor of resources needs to be considered.

The level 4 programme includes, but not be limited to, the detail of activities for completion of procurement, construction, pre-commissioning and testing and hand-over.

The level 4 programme must adhere to the following requirements:

- Schedule Integrity
  - No links to and from summary tasks.

- Do all tasks have at least one Successor & one Predecessor? (Accept starting & end tasks or external milestones)
- Have tasks with a large amount of Total Float been investigated? (this could be an indicator that it is not properly linked in the schedule)
- All constraints need to be motivated. (Shutdown / GO / Availability of equipment)
- Negative lag in the programme to be limited to absolute minimum and shall only be used for activities that is governed by its successor for example. “Site establishment” that is governed by “start of shutdown”. All negative lags shall be motivated in the “basis of program” document.
- Does the logic sequence of activities and critical path make sense
- No level 4 activities must exceed 10 days

Actual start and completion dates are reported.

Progress “S-curves” indicating early and late starting and completion dates is submitted with each revised program.

Critical Path Method planning to be used always.

Critical path to be clearly identified using hard logic.

Revised forecast dates to be communicated and clearly shown on the schedule.

10.2 Program Risk Assessment

1. The impacts of probable risks to activities to be considered and required actions for preventing impacts thereof to be compiled in an action plan.
2. The action plan needs to be submitted with the revised program.

10.3 Daily Reports (Site work only)

1. Daily diaries must indicate the daily activities, the resources utilized on site, activity duration, deviations (if any) and signed off by the *contractor’s* representative.

The daily dairy must contain the following as a minimum

- Safety status
- Planned activities for the previous period
- Previous planned activities not met
- activities for next period
- Areas of concern
- Areas of opportunity where activities can be brought forward
- Progress curves (S-Curve and deviation curve)
    - Template can be provided, if necessary
- Labour report indicating the *contractor’s* available manpower to meet the program for Provision of the Works
- Daily look ahead of all activities planned for the week

- Any slippages to the agreed baseline and recovery plans to pull back the progress to the agreed baseline

A full-time planner/scheduler must be provided by the *contractor* and must be on-site and visible during the downtime window to provide updates, curves, recovery plans or any other planning related functions required by the *Project Manager*

10.4 Monthly Reports

1. The monthly report must as a minimum contain the following
    - Safety status
    - Executive summary
    - Planned progress vs Actual Progress
    - activities for the past period
    - Previous activities not met
    - activities for next period
    - Areas of concern
    - Areas of opportunity
    - Progress curves (S-Curve and deviation curve)
    - Procurement actions completed and future actions
    - Cost control: status of budget and payments made to date
    - Schedule performance index and cost performance index using earned value principles
    - Compensation Event (CE) register and status thereof
    - A summary register of all early warnings raised and status thereof
    - Labour Statistics.

11 Financial

1. The Contractor must submit a proforma invoice to the Project Manager for acceptance after the assessment date.
2. The Project Manager will return the signed proforma with comments, if any, to the contractor.
3. The contractor must incorporate the comments on the accepted proforma invoice and send the tax invoice, either electronically or a hard copy, before the first of the month to:

    Name: Invoices ACSA

    Work: **Direct: +27 11 921 6200**

    Email: Invoices.Acsa@airports.co.za

    Deviations to this will result in late payment.
4. The Contractor's invoice must as a minimum contain the following:

The registered name of the company

The VAT registration number of the company

The VAT registration number of ACSA. (4930138393)

The Contractors contract number

The invoice sequence number

The amount paid to date

The value of the invoice amount

Any retention monies to be deducted from the invoice.

12 List of Attachments

12.1 Appendix A: Prelim Piping and Mechanical drawings

Document Nr.	Rev	Description
Appendix A-1- P&ID-899-C-A2-5011	K	P&ID - OR TAMBO INTERNATIONAL AIRPORT FUEL STORAGE FACILITY
Appendix A-2-P&ID-1326-M-PID-3001	02E	P&ID - LEAK DETECTION SYSTEM APPRON FUEL HYDRANT NETWORK
Appendix A-3-MCP2160079-MDL-001	0A	Piping 3D model (Use Navisworks Freedom 2024 to open)

12.2 Appendix B: Prelim Mechanical and Piping BOQ

Appendix B- Prelim Mechanical and Piping BOQ Rev P3

12.3 Appendix C: Civil And Structural Drawings

Document Nr.	Rev	Description
Appendix C-1	P	Overall Layout and Excavation Sections
Appendix C-2-DW-1000-001	OB	Prelim VCM1 Valve Chamber Plot Plan and Sections
Appendix C-3-SK-0500-001	OA	Site Layout
Appendix C-4-SK-0500-002	OA	Layout and Long Sections 1
Appendix C-5-SK-0500-003	OA	Layout and Long Sections 2
Appendix C-6-SK-0500-004	OA	Layout and Long Sections 3
Appendix C-7-MORT01D01-Model	N/A	GPR Scanning overall model/layout

12.4 Appendix D: Civil and Structural BoQ

Appendix D- Prelim Civil BoQ Rev P3

12.5 Appendix E: Control and Instrumentation Sitting and Layout

Appendix E Control and Instrumentation Sitting and Layout

12.6 Appendix F: Control and Instrumentation BoQ

Appendix F Control and Instrumentation BoQ Rev 0C

12.7 Appendix G: Electrical Drawings

Appendix G: Electrical Drawings

12.8 Appendix H: Electrical BoQ

Appendix H: Electrical BoQ Rev D

12.9 Appendix I: Pipe Jacking Works Information

Appendix I-Pipe Jacking WI and BoQ Rev.0C

12.10 Appendix J: GPR Scanning Report

Appendix J -GPR Report PER0256 - MegChem GPR ACSA rev 1

12.11 Appendix K-Cathodic Protection

Appendix K-MCP2160079-FSR-001 Rev B

12.12 Appendix L- Preferred Vendors list