PART 3: SCOPE OF WORK

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C3.1: EMPLOYER'S WORKS INFORMATION

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1 Description of the *works*

1.1 Executive overview

1.1.1 Description

Kusile Power Station is a 4800MW rated power station with each of the 6 Units rated at 800MW. Combustion of fossil fuels at Kusile Power Station results in particulate and gaseous pollutants which are discharged into the atmosphere. In order to limit the detrimental effects to the environment, the pollutants are regulated under the National Environment Plan: Air Quality Act 39 of 2004. CEMS probes and analysers are installed in the chimney at 150m level for monitoring particulate matter gaseous emissions which are sulphur dioxide (SO2), the nitrogen oxides (NOx), carbon monoxide (CO), carbon dioxide (CO2) and oxygen (O2).

The CEMS is installed to meet the requirements of the AEL at Kusile Power Station in all Units. It is a requirement that CEMS is available 80% of the time. It is unfortunate that CEMS at Kusile operates at an unfavourable environment. Whilst the solutions to address the under performance of the primary sources of the unfavourable conditions for CEMS are being explored, there is an attempt to modify or upgrade the CEMS so that the technology that can perform under these extreme conditions can help the station to monitor emissions.

Eskom requires that the considered *Contractor* shall as a minimum, provide the following:
a) The *Contractor* shall complete the scope of work as outlined in this document.

b) The *Contractor* shall provide proof of competence for installation and commissioning of dust and gas analysers.

c) The *Contractor* shall have experience of installing and commissioning of dust and gas analysers at at-least two local sites.

d) The *Contractor* shall have experience of electrical installation as per Occupational Health and Safety Act requirements.

e) The *Contractor* shall ensure compliance with relevant health and safety standards.

f) The Contractor shall provide 12 months of maintenance support, installation training and operational spares.

The responsibilities of the Employer include the following:
a) Provide clarify on the scope of work to the *Contractor* as and when required.

b) Participate in quality control holding point as stipulated on the quality control plan.

c) Authorise final release of product.

d) Conduct design review and acceptance.

e) Provide power supply for all electrical works.

Interpretation and terminology

Abbreviation	Explanation
AEL	Atmospheric Emission License
C&I	Control and Instrumentation
CEMS	Continuous Emission Monitoring System
CO	Carbon Monoxide
CO2	Carbon Dioxide

DCS	Distributed Control System
FGD	Flue-gas desulfurization
GA	General Arrangement
HMI	Human Machine Interface
IP	Ingress Protection
ISO	International Organisation for Standardisation
ITP	Inspection Test Plan
JB	Junction Box
NCR	Non-Conformance Reports
NGL	Natural Ground Level
NOx	Nitrogen Oxides
O2	Dioxygen
OEM	Original Equipment Manufacturer
OTS	Operating Technical Specification
QA	Quality Assurance
QC	Quality Check
QCP	Quality Control Plan
QMS	Quality Management System
SANS	South African National Standard
SO2	Sulfur Dioxide
VDSS	Vendor Documentation Submittal Schedule
WFGD	Wet Flue-gas desulfurization

The *Contractor* shall furnish and install all required materials to complete this work.
The works must include but not be limited to:

a) Selection of fit for purpose dust and gaseous analysers applicable in a WFGD system for approval by Eskom personnel.
b) Supply of dust analysers, gas analysers, water tanks, pumps, motors, level and flow instruments, cable pin lugs, instruments cables and power cables.
c) Install the dust analysers, gas analysers, instruments cable devices and interface to existing JB.
d) Decommission existing analysers and commission all newly installed analysers.
e) Modify the flanges for CEMS replacement in each Unit.
f) Design, install and commission the purging system.
g) Install and commission level and flow instruments for the water tank, instrument cables and interface to existing JB.
h) Install and commission pumps for purging.
i) Provide maintenance support, installation training and operational spares.
j) Provide the equipment list.
k) Manufacture and install the KKS tags based on the list from the Employer.

1.1.2 Capacity

These CEMS replacement shall be used for the monitoring of gas and dust. This system will analyze dust and gaseous emissions across all the Units at the smokestack.

1.1.3 Control & Instrumentation

a) All field equipment & installations shall comply with the field installation standard as follows:

i. Passageways and the movement of people and equipment during maintenance activities.

ii. Ergonomics and maintenance access to the equipment.

iii. Field equipment supports shall not be welded to vessels or handrails but shall utilize self-supported racks with integrated cable and tubing trunking.

iv. Instrumentation and transducers shall be grouped together in areas away from other maintenance activities and where the environmental conditions are more favorable for the equipment.

v. All instruments on the racks shall be installed on the same level and with even spacing between instruments.

b) The equipment installed shall be sufficiently protected against lightning induced currents.

c) Each of the equipment installed shall be assigned a unique identity (KKS) by the *Employer* based on the submitted equipment list from the *Contractor*.

d) All labels shall be in accordance with *Employer* specification. The location and designation of labels shall be to *Employer's* approval.

e) Analyzers shall be installed at each duct on the smokestacks at 151m level, with a cable connecting to an existing JB.

f) The *Contractor* shall verify that the equipment has 4-20 mA signal. This analogue signal shall be used for alarming in the control room.

g) Alarms shall be activated in the control room should there be high dust concentration, gas concentration or any system failure.

h) Any installation procedures not specified herein shall be done in accordance with the manufacturer's recommendations and good Engineering practice and shall be approved by the Engineer.

i) All supports provided and installed by the *Contractor* shall be suitable for the seismic rating required for the facility.

j) All field equipment shall operate over an ambient temperature range of: -10□C to 50□C.

k) The equipment layout shall be such that when mechanical work is performed, no C&I equipment is damaged.

l) All IP ratings shall be as per SANS 60529.

m) All field equipment shall be installed in a suitable location ensuring that it operates in an environment within the parameters stipulated by the manufacturer.

n) The selection and installation method of cabling and associated equipment, such as racking and junction boxes, panels shall be based on the environmental conditions it will operate in.

o) The configuration of all cables, conduit and trunking associated to the enclosure shall be uniform and follow proper installation techniques as per Field Instrument Installation Standard, 240-56355754. The wiring of low voltage installations, and other appropriate installation standards shall be approved by the Eskom before the contract is placed.

1.1.4 Electrical Requirements

a) The *Contractor* to ensure that pump and motor designs adhere with Kusile reticulation of 6,6 kV and 400 V.

b) The *Contractor* shall install a 5.5kW electrical pump on 0m level, along with a motor control panel. New distribution boards to be installed on 151m level for the CEMS equipment.

c) Cables to be used should be of XLPE nature to ensure that Kusile standard is maintained.

d) The *Contractor* is responsible for cable terminations both on the supply and load side.

e) The *Contractor* designs, installs and tests earthing and lightning protection systems for the Electrical equipment that ties in with existing earth mat.

f) The *Contractor* evaluates the closest earth point of the existing station earth mat to connect with newly designed earthing and lightning protection system.

g) Earthing systems are aluminium to avoid implications of copper theft. The *Contractor* ensures that the aluminium conductors selected have equivalent earth resistance, as to when copper is used.

h) Datasheets and certificate of compliance are to be provided for all electrical equipment that are utilised on this project.

i) The *Contractor* is to request for clarification should there be any conflicting requirements.

1.1.5 Water Supply Requirements

This water will be used to supply the head tanks that will be located inside the smokestack at 180m level. The water supply tapping point is at -1.8m level, at the water abstraction point in a manhole below NGL near the main stack and connecting to the plant water supply network (potable water network). The motor control panel and pump shall be located at 0m level by the stack, and pipework for water delivery to the tank at 180 m level shall be provided.

Booster Pump Requirements:

- The pump shall be carefully designed and selected to meet the water demand at the specified heights of 180m.
- *Contractor* to determine flow rate at tie in point.
- *Contractor* to determine pressure at tie in point.

Pipework Requirements:

- All pipelines for this purpose shall be hot dipped galvanized steel specified in SANS 121. All pipes shall conform to SANS 62 and SANS 719. All mild steel pipes and equipment shall be pressure rated according to the maximum working pressure in the system.
- GRP as specified in SANS 1748-3 Part 3.
- Pipework colour coding shall be done in accordance with the Eskom colour coding standard.
- Any welding shall be done in line with Eskom Weld Rule book.

Flange and Bolting Requirements:

All flanges supplied for system shall conform, as a minimum, to SANS 1123.
All flanges and bolts installed should:

- Flanges that comply with the requirements of SANS 1123.
- Bolts and nuts that comply with the requirements of SANS 1700.

Pipe Supports Requirements:
All hangers and hanging material will be hot dipped galvanized to SANS 121 after fabrication, and either welded or bolted on site. Site repairs and welding will be touched up with cold galvanizing in accordance with SANS 121.

Fasteners Requirements:
Fasteners shall conform, as a minimum, to SANS 1700, including the following:

- All fasteners used are metric fasteners.
- Each bolt head is fitted with a flat washer.
- Each nut is fitted with a flat washer.
- Each bolt length is sized so that two full threads are visible (minimum).
- No bolts are cut to the 'right' size.
- All fasteners are new.
- All fasteners are coated in an anti-seize compound before fastening.

1.1.6 Compressed Air System

Table 1 shows design information for the compressed air to be used for smokestack analysers and design parameters. Material and dimensions of the piping, fittings and valves are provided on the drawings (0.90/10025, 0.90/10026 and 0.90/1234 sh11).

Media	Service air
Supply pressure	800kPa
Supply flow	111 Nm3/min
Pipe size	50mm (DN50)
Type of connections	Threaded
Material	Galvanized Mild steel

The analyser will use service air supplied from the tapping offs at East and West FGD absorber plant since it's near the smokestacks. The compressed air will be supplied from east and West compressor plant.

East and West Smokestack Analysers:

a) Work shall begin once all designs are approved for construction, QCP's are approve by Eskom representatives.
b) Service air will be supplied from service air main supply from compressor plant to the FGD absorber plant.
c) Point of tapping: Service air will be tapped from the main supply line (KKS: 00QEB71BR003 for West service airline and KKS:00QEB71 BR004 for East service airline).
d) At the point of tapping ball valve should be installed for isolation purposes. Material of the isolating valve should match of the pipelines. All the valves should be threaded.
e) Final release of the equipment should be done by Eskom System Engineer.

1.1.7 Civil and Structures

1.1.7.1 180m level platforms

The *Employer* requires the *Contractor* to design and commission a suitable and competent surface bed or foundation near or within the main stack and NGL for the placing and fixing of the piping system, valves, strainer, and related installations.

Structural IPE beams of the main stack staircase for the mounting and fixing of the piping network support brackets using non-destructive clamping solutions shall also be completed by the *Contractor*.

The *Contractor* shall perform the structural design assessment of the existing structural steel platforms to support the water tanks for the purging system. Therefore, the *Contractor* is to make sure the proposed tank does not compromise the structural integrity of the steel platforms. The proposed locations to house and support the tank is the 180m level platforms inside the East and West Smokestacks
The *Employer* is responsible for furnishing the *Contractor* with the design reports and drawings for the platforms.

1.1.7.2 90m level and 151m level platforms

The *Contractor* is required to perform the structural design assessment of the existing structural steel platforms to support the water tanks for the purging system. Therefore, the *Contractor* is to make sure the proposed tank(s) do not compromise the structural integrity of the steel platforms. The proposed locations to house and support the tank(s) is the 90m level and 151m level platforms inside the East and West Smokestacks. The positioning of the tank(s) shall be proposed by proposed based on the instrumentation and piping study performed by C&I Engineering.
The *Contractor* shall receive the design reports and drawings for the platforms from the *Employer*. Further, the *Contractor* shall liaise with the *Employer* on further civil and structures information required for the assessment.

1.1.8 Flange Modification

The *Contractor* shall modify the existing flange material and size on the chimney to accommodate the new analyzers. Modification of the flanges will resolve the issue of the existing analyzers as they are not sloping downwards.

1.1.9 External and Internal Coating

The *Contractor* shall make use for external and internal coating.

1.1.10 Documentation

The *Contractor* shall furnish fully annotated and indexed hard copy printouts of the loop drawings, mechanical hookup drawings, termination schedules, and cable schedules. The *Contractor* shall also provide the installation, operation, maintenance, training manuals, spare list, and drawings showing all control power, and grounding. Typical instrument stand GA drawings for each type of instrument stand shall be available to be provided showing dimensions, structural supports etc. All the drawings shall be in a Portable Document Format (PDF).

1.1.11 Assumptions and Evidence

a) KKS of the additional devices to be installed will be based on existing KKS plan for the plant installation base.

b) The DCS configuration updates shall be implemented by Kusile Power Station Generation C&I Engineering personnel.

c) The commissioning of the dust and gas analyzer loops shall be executed with an integration test with the DCS status.

d) Installation will be done with requiring unit shutdown.

e) Supplier can supply, install, and commission the required system within specified time frame.

f) The project shall depend on outage dates for Kusile Power Station.

g) The existing ABB DCS has enough spare capacity to accommodate the recommended design.

1.1.12 Station Risk

To manage the risk of DCS unavailability during the installation. The installation and commissioning of the equipment shall be done for one Unit at the time by the *Contractor*. This work shall be completed while the Unit of off, during the Kusile Power Station outage dates for each Unit.

1.1.13 Configuration Management Requirements

Comprehensive Configuration Management (CM) programme is to be established and applied throughout the duration of the work execution (kick-off to close-out) and shall be in compliant with ISO 10007: Quality Management System. It shall include the following elements as minimum requirements.

a) Technical Document Management/Control (incl. Handover reviews).

b) Plant labelling and coding (240-71432150: plant system identification or label (KKS))

c) Engineering Change Management or Control (240-51093273)

d) Configuration Status Accounting

Configuration management activities to be performed throughout the work execution and maintenance, record, and report on the status of all proposed engineering changes including deviations from configuration standards. An engineering change register per work execution shall be maintained throughout the life cycle of the project or contract. All KKS codes will be created based on VGB standards and supplied and approved equipment list and migrated to SAP PM post work completion or handover.

1.1.14 Parts of the *works* which the *Contractor* is to perform

The *Contractor* shall carry out, compile a Kusile specific detailed CEMS for the installation base. The *Contractor* shall do a site visit, inspect, and determine analysers and other project equipment placement, alarming remotely with non-voting systems and best measurement range to achieve the highest possible detection coverage. However, the appointed *Employer's* representatives will be required to work in close collaboration with the *Contractor* and assume overall responsibility on behalf of the *Employer for all activities carried out the installation and commissioning.*

Work with the *Employer*'s representatives to update drawings.

Work with the *Employer*'s representatives to create unique KKS for the additional devices.

Work with the *Employer*'s representatives to commission the CEMS replacement.

All instrument installation and accessories shall be executed and supervised by personnel experienced in this type of work.

Sequence of installation work shall be coordinated with the Engineer and other *Contractors* to support the project commissioning schedule.

2 Management and start up.

2.1 Management meetings

Regular meetings of a general nature may be convened and chaired by the *Project Manager* as follows:

Title and purpose	Approximate time & interval	Location	Attendance by:
Project Kick-off Meeting	1 x week post Contract	Kusile Power Station	Employer, Contractor

	Award		and Others
Execution Progress Meeting	Bi- Weekly	Kusile Power Station	Employer, Contractor and Others
Risk register and compensation events	Bi- Weekly	Kusile Power Station	Employer, Contractor

Meetings of a specialist nature may be convened as specified elsewhere in this Works Information or if not so specified by persons and at times and locations to suit the Parties, the nature and the progress of the *works*. Records of these meetings shall be submitted to the *Project Manager* by the person convening the meeting within five days of the meeting.

All meetings shall be recorded using minutes or a register prepared and circulated by the person who convened the meeting. Such minutes or register shall not be used for the purpose of confirming actions or instructions under the contract as these shall be done separately by the person identified in the *conditions of contract* to carry out such actions or instructions.

2.2 Documentation control

All contractual communication between the *Employer* and the *Contractor* shall be in the form of properly compiled letters or forms attached to e-mails and not as a message in the e-mail itself. All formal communication is via the Project Manager.

2.2.1 Process for Documentation Submission

All documentation submitted must be accompanied by the completed transmittal with the following fields as a minimum:
a) Name of Contractor
b) Transmittal Number
c) Contractor Details
d) Date of Submission
e) Description of Document
f) Document Number
g) Document revision
h) Document type
i) Document media type
j) Number of copies
k) Signed by and date.

Final documentation is submitted in both electronic and hard copies to the Employer's Project Manager. The Contractor adheres to one soft copy in a compact disc and one hard copy per station.

2.3 Health and safety risk management

All contractors shall, before commencement of the project ensure that all their employees are familiar with the relevant Eskom Kusile Power Station OHS documentation that is applicable to contract services.

Before the Appointed Contractor commences with any work, The Safety file package must be submitted to the OHS department **2 weeks** before the agreed project commencement date.

The OHS department shall assess and give written feedback to the appointed contractor.
The safety file shall be approved by a form of a written letter, the letter shall authorise the appointed contractor to commence with site establishment.
Before the appointed contractor commences with any work, the Kusile power station Project Manager/Contract Manager shall ensure that;

a) A copy of the SHE Specification document is in the possession of the responsible person of the contracting company as well as the Kusile Power Station baseline risk assessment.
b) The responsible person of the contracting company and the Kusile power station project manager/contract manager have signed the Kusile power station section 37 (2) agreement.
c) The appointment of the Appointed Contractor have been concluded and signed by the Contractor and Appointed Project Manager. A task specific baseline risk assessment must be part of the SHE Plan and accompanied by a risk assessment procedure applied. A monitoring and review plan must form part of the baseline risk assessment
d) Where a Sub Contractor(s) is appointed by the Appointed Contractor, the Contractor supplies the applicable Kusile power station SHE specifications to the Sub Contractor(s).
e)

2.3.1 Requirements Specific to the issued Scope of Work

Continuous Emission Monitoring System (CEMS) Replacement at Kusile Power Station.
In compliance with legal and other requirements, the following requirements must be complied with fully:

1) There must be a written method statement signed by the Kusile Contract Manager and Appointed Contractor that shall detail how the activity shall be carried out
2) The activities must be carried out with the Supervisor present at all times
3) The supervisor must conduct planned task/ job observations and submit to the OHS department weekly reports.
4) Certificate and environmental certificate must be issued before any person is allowed to enter.
5) Employees must be medical fit to perform the task.
6) Medical certificates of fitness that are valid must be part of the safety file package including identification documents of the employees and their competency certificates
7) The safe work procedures must indicate how the Continuous Emission Monitoring System (CEMS) Replacement scope of work activities will be done safely without endangering the health and safety of employees.
8) Submit a detailed SHE plan which must be suitable, practical, site specific, well- documented and a workable SHE document, compiled to satisfy the requirements of the OSH Act 85 of 1993, the Sub-'s safety specifications and other relevant legislation. The SHE plan must be aligned in terms of suitability and adequacy to the extent of the scope of work. The SHE plan should detail how health and safety would be implemented while on site looking at the scope of work as well as any legal and other requirements applicable to the project to be carried out.
9) The SHE plan must show and describe the assignment of responsibilities, procedures and actions to be taken in the process of implementing and maintaining the SHE plan as well as include how deviations/non-conformances shall be managed.
10) The SHE plan must be approved by the Kusile project manager/contract manager in writing before it is submitted to OHS department.
11) The contractor must identify suitable PPE required for the activities including the identification of appropriate tools
12) The contractor must submit job descriptions supported by proof of competencies for all employees.
13) Applicable legal appointments must form part of the safety file with competency certificates per appointment.

Health & Safety Representative Required Competencies:

i. General Health and Safety Training
ii. Health and Safety Representative Training
iii. Hazard Identification and Risk Assessment Training
iv. Incident Investigation and Root Cause Analysis Technique Training

Supervisor Required Competency:

i. Three years applicable experience as a supervisor
ii. Attended an accredited supervisor's safety course
iii. General Health and Safety course
iv. Incident Investigation and Root Cause Analysis Technique Training
v. Hazard Identification and Risk Assessment Training

Safety Officer Appointment typical competencies

i. OH&S Act and Regulations (latest version of the Act and regulations);
ii. COID Act (latest version of the Act);
iii. Incident Investigation and Root Cause Analysis Technique;
iv. Hazard Identification and Risk Assessment Training;
v. Emergency Preparedness Coordination Training

The *Contractor* shall comply with the health and safety requirements contained in Kusile Power Station OHS Specification for Continuous Emission Monitoring System (CEMS) Replacement

2.4 Environmental constraints and management

A Safety, Health, Environment and Quality (SHEQ) specification is Kusile Power Station's minimum requirements detailing also constraints, which are required to be met for the specific contract and for the duration of the contract period by the Contractor.
The Contractor is expected to develop a SHEQ plan which meets these requirements as well.

as relevant and other legal and other requirements applicable to the issued scope of work.
Kusile Power Station in no way assumes the contractor's legal responsibilities. The contractor is and remains accountable for the quality and the execution of his/her health and safety programme for his/her employees and appointed contractor employees.
This SHEQ specification reflects minimum requirements and should not be construed as all encompassing.

a) The contractor and or supplier shall have a documented and implemented environmental management system e.g. environmental policy, operational procedures relating to their activities, Environmental Aspects and Impacts Register.
b) The contractor and or supplier shall prepare an environmental management plan relating to their activities that will be carried out. The environmental management plan shall be based on, amongst others, Eskom Kusile Power Station's OEMP and any other applicable environmental legislation. The environmental management plan must include all the aspects and impacts relating to the activity and address the principle of continual improvement.
c) The contractor and or supplier employees shall attend induction on environmental management prior to commencement of work at Kusile Power Station.
d) The contractor and or supplier shall comply with all Eskom Kusile Power Station environmental requirements such as policies, standards and procedures.
e) The contractor shall appoint trained and competent personnel in writing, who will have the responsibilities of implementing all environmental requirements on a specific contract.
f) Non-conformance and All spills/emergency incidents shall be reported to Eskom Contract Manager and Environmental Officer(s) immediately on occurrence, such reports must include but not limited to the following information:
    a. The date and time of the incident
    b. The cause of the non-conformance/incident;
    c. The proposed actions to correct and prevent recurrence.
g) Eskom Kusile Power Station shall issue non-conformances where there are deviations from Eskom Kusile Power Station Procedures and any other environmental requirements, and the Contractor or Supplier shall be responsible to provide an action plan and close out of such non-conformances timeously.
h) Environmental Incident Investigations shall be done jointly where responsible managers and the environmental team from Eskom and the Eskom subsidiary or contractor are present.
i) Environmental Incident investigation shall be done in accordance to Eskom Environmental Incident Management Procedure (240-133087117).
j) The contractor or supplier shall be responsible to ensure duty of care during execution of work at Kusile Power Station and shall be liable for the costs for the costs of remedying pollution, *environmental degradation and consequent adverse health effects as indicated on the NEMA principles below:*

National Environmental Management Act 107 of 1998 (NEMA) principles:
• Duty of care and remediation of environmental damage

Every person who causes, has caused or may cause significant pollution or degradation of the environment must take reasonable measures to prevent such pollution or degradation from occurring, continuing or recurring, or, in so far as such harm to the environment is authorized by law or cannot reasonably be avoided or stopped, to minimize and rectify such pollution or degradation of the environment.

• Polluter Pays Principle

The costs of remedying pollution, environmental degradation and consequent adverse health effects and of preventing, controlling or minimizing further pollution, environmental damage or adverse health effects must be paid for by those responsible for harming the environment.

a) The *Contractor* and or supplier shall allocate funds for the implementation of environmental requirements.
b) All contractors shall abide to Eskom Zero Liquid Effluent Discharge through the process of reuse and recycling.
c) All waste generated during the execution of the scope of work shall be managed in accordance with Kusile Power Station Waste Management Work Instruction (240-105776552) and in compliance with applicable environmental legislation and bylaws.
d) All contractors should be aware of Eskom SHEQ Policy.
e) All contractors must take into account environmental consideration when carrying out Risk Assessments.
f) All equipment used on site must be in good working condition and no fuel and/or oil leaks on any plant will be tolerated.

Records to be kept onsite for Environmental Management

The following minimum records shall be kept on sites:

a) Contractor site specific Environmental Management Plan and Environmental aspect and impact register.

1. Environmental aspect must be identified, and how they should be mitigated and also be communicated to employees. Proof of communication must be available

b) Environmental Incident registers and investigation reports.

2. Incident must be reported immediately or within 24 hours of occurrence, investigation must take place within 7 days and concluded with 30 days, lesson learned must be shared with employees. Record of environmental incidents must be made available.

c) Non-conformance register.

3. When non-conformances are closed, they should be investigated and close-out within the agreed timeframes.

d) Complaints register. Where complaints are raised they should be reported to Kusile Environmental management Department, be investigated and closed out.
e) Waste disposal register

f) Hazardous Substances registers and SDS where applicable.

4. Where hazardous substances are used, a register should be maintained and all SDS should be available and communicated to employees.

g) Records of audit reports and audit findings close-out, where applicable.
h) Records of audit and how findings where closed should be maintained.
i) Records of environmental inspections conducted.

5. Monthly environmental inspection should be conducted and records of inspections should be maintained.

j) Licences for Landfill sites/Waste Treatment plant for all waste streams generated and disposed by the contractor.

k) Registration certificate for a waste service provider appointed by the contractor
l) Safe disposal certificates or weighbridge certificates for all waste disposed.

Tender Submission Documentation

The following documentation shall be submitted with all tender submissions:

a) Environmental Policy
b) Aspect and impact register or an environmental management plan (relevant to the scope of work)
c) Environmental Management System Certificate (if certified) if not, an environmental management system manual or procedures
d) Waste Management Plan
e) Proof of training of persons performing activities that could have significant impact on the environment.

The Contractor shall comply with (SHEQ) requirements contained in Annexure A of this Works Information

2.5 Quality assurance requirements

It is important for all Eskom contractors to meet the minimum requirements of ISO 9001 Quality Management System to maintain high standards of products or services rendered to Eskom.
It is therefore important that the contractor demonstrate commitment to the development, implementation and maintenance of its Quality Management System that complies with the ISO 9001:2015 requirements.

This work falls under **Category 2** of the Quality Requirements. The supplier is therefore required to submit the following documents and evidence:

SECTION A: Quality Management System Requirements ISO 9001

(Option 1) Valid certification of Quality Management System by an ISO accredited body

OR

(Option 2) Objective evidence of documented QMS that is not certified but complies with ISO 9001:

A.1 QMS Manual or a document that defines and describes the QMS and its scope.
A.2 Quality Policy Approved by top management.
A.3 Quality Objectives Approved by top management.
A.4 Control of documented information (i.e. document and record control)
A.5 Documented information for Control of nonconforming outputs
A.6 Documented information for Nonconformity and Corrective action
A.7 Documented information for Internal audit

SECTION B: Evidence of QMS in operation
B.1 Documented information for defined roles, responsibilities and authorities.
B.2 Documented information for Control of Externally Provided Processes, Products and Services
B.3 Latest copy of an internal management system audit report
B.5 Records of Management Review meetings (minutes, attendance registers etc.)

SECTION C: Contract Quality Plan Requirements
Draft Contract Quality Plan specific to the scope of work

SECTION D: Quality Control Plan Requirements
QCP /Checklist/ ITP (Quality Control Plans) as per Scope of Works

SECTION E:
E.1 Completed and Signed Form A

2.5.1 Non Conformances and Defects

Where NCR's and Defect notifications are issued, the *Contractor* acknowledges receipt within 48 hours and proposes corrective and preventive actions to the *Project Manager* as per the contract response period. The corrective and preventive actions will include the implementation and completion dates. Progress on all NCR's and Defect notifications issued to the *Contractor* must be reported to the *Project Manager* on monthly basis.

The *Contractor's* Quality Manager keeps a register of all NCR's and Defect notifications issued. Deviations from the Contract are treated as a non-conformance. Records of NCRs and Defect notifications are kept and form part of the data book records.
During the contract execution phase, the *Contractor* will be monitored by the *Project Manager* for performance on quality related aspects. The monitoring will be in the form of audits and assessments.

2.6 Programming constraints

2.6.1 Inclusions in the programme

General
This contract shall follow ECC contract, Clause 3-Time.
The Contractor submits a Level 4 Microsoft project or Primavera P6 programme for the project manager acceptance.

- Discipline Speciality Program (Level 4)

This is the execution Schedule, also called a Project Working Level Schedule. Level 4 is the detailed working level schedule, where each schedule is an expansion of part of a Level 3 schedule and is established within the integrated project schedule.

This programme typically represents day-to-day tasks which are work unit based and become summarised in the Level 3 activities showing the following:

- The starting date, access dates, key dates, and planned completion date.
- The order and timing of all tasks which the contractor plans to do in order to provide the works
- Critical path
- Float
- Time risk allowances, which shall include weather allowance.
- Health and safety requirement

2.6.2 Computerised Planning and Reporting

The programme shall be submitted in MS Project/ Primavera P6 format and the basis of schedule to support the schedule, showing inclusion and exclusions.

2.6.3 Project Calendar

The project calendar includes working days (Monday to Friday) and excludes non-working days which are weekends (Saturday to Sundays) and Public Holidays. If and when the Contractor deems any period in a calendar year as a non-working day, e.g. pay weekends, etc. such shall be declared up front and agreed with the Project Manager in the first programme for acceptance by the Project manager. Failure to declare these days shall render any later declaration as null and void and the Contractor shall provide the services to comply with the accepted first programme.

2.6.4 Additional Programme Requirements

The programme layout takes into account the Key Dates provided in the Contract and the Work Breakdown Structure (WBS).

The following levels of programme are to be used for this project for dynamic integrated project control:

- Management level programme (Level 1)
- Project level programme (Level 2)
- Control level programme (Level 3)
- Discipline speciality programme (Level 4)

2.6.5 Submission of Revised Programmes

The Contractor submits one electronic copy in MS Project (MPP) of the revised programme to the Project Manager for acceptance. The contractor shows on each revised programme.

- The actual progress achieved on each operation and the timing of the remaining works
- The effects of the implemented compensation event
- How the contractor plans to deal with any delay and to correct the notified defects
- Any other changes that the contractor proposes to make to the acceptance programme.

2.6.6 Bi-Weekly Progress reporting

A bi-weekly status report is submitted by the Contractor to the Project Manager. The Contractor submits updated programme bi-weekly or as instructed by the Project Manager.

. Contents of a weekly report will include the following items:

- The updated MS Project/ Primavera P6
- Programme summary narrative (Basis of schedule)
- Progress and performance summaries
- Key Milestone status

2.7 *Contractor*'s management, supervision and key people

Contractor to submit an Organogram for the company indicating all roles and responsibilities relevant to the implementation of the work stated in this document. The *Contractor* is required to make all appointments as per the technical, Quality and Health and Safety and Environmental requirements. The *Contracto*r shall provide all SHEQ and compliance documentation which include but not limited to the following:

- SHEQ policy
- SHE Plan
- Environmental Plan
- Environmental Policy
- Risk Management Plan
- Baseline Risk assessment
- All accreditation and qualifications
- Technical and professional organizations affiliations.
- SHEQ appointments

SHEQ accreditations

2.8 Invoicing and payment

Within one week of receiving a payment certificate from the *Project Manager* in terms of core clause 51.1, the *Contractor* provides the *Employer* with a tax invoice showing the amount due for payment equal to that stated in the *Project Manager's* payment certificate.

The *Contractor* shall address the tax invoice to Eskom Holdings SOC Ltd and include on each invoice the following information:

- Name and address of the *Contractor* and the *Project Manager;*

- The contract number and title;
- *Contractor*'s VAT registration number;
- The *Employer*'s VAT registration number 4740101508;
- Description of service provided for each item invoiced based on the Price List;
- Total amount invoiced excluding VAT, the VAT and the invoiced amount including VAT;
- The invoice is to be submitted to invoiceseskomlocal@eskom.co.za once confirmed with the payment certificate.

2.9 Contract change management

Contract change management shall be done as per the NEC ECC compensation event process.

2.10 Provision of bonds and guarantees

The form in which a bond or guarantee required by the *conditions of contract* (if any) is to be provided by the *Contractor* is given in Part 1 Agreements and Contract Data, document C1.3, Sureties.

The *Employer* may withhold payment of amounts due to the *Contractor* until the bond or guarantee required in terms of this contract has been received and accepted by the person notified to the *Contractor* by the *Project Manager* to receive and accept such bond or guarantee. Such withholding of payment due to the *Contractor* does not affect the *Employer*'s right to termination stated in this contract.

2.11 Training workshops and technology transfer

The *Contractor* shall have training program which is structured to provide the Customer's attendees with sufficient knowledge to carryout engineering, operations and maintenance during the operational life of the detector system.

3 Engineering and the *Contractor*'s design

3.1 Parts of the *works* which the *Contractor* is to design

Refer to Section 1.1 of this document

3.2 Procedure for submission and acceptance of *Contractor*'s design

The *Contractor* ensures that the Technical Documents and Records Management Work Instruction, 240-76992014 is adhered to for all documentation requirements. The *Contractor* is responsible for the compilation and the supply of all documentation during the various project stages. The *Contractor* makes provision in their programme for the submission of design documentation. For consistency, it is important that all documents used within the project follow the same layout, style and formatting as described in the Technical Documents and Records Management Work Instruction, 240-76992014. Documents such as QCP's, Method Statements etc. that impact the project works to be approved by the *Employer* at least 3 working days prior to commencement of the works.
Each revision of a document or drawing shall be accompanied with a list of comments made by the *Employer* on previous revisions, if applicable. The responses/corrective actions taken by the *Contractor* to be recorded in a revision table contained in each drawing/document.
Documents and drawings to indicate the *Employer*'s unique identification number as allocated by the Employer. The *Contractor* may also have his own internal document or drawing number on the document or drawing.
The *Contractor* compiles a complete data book for all works performed during manufacturing, construction and commissioning. The data package to contain the following attributes as a minimum, where applicable:

- Design drawings used to execute the works
- Approved construction/installation method statement

- Approved QCP/ITPs
- Material certificates/data sheets for all components
- Test reports
- Calibration certificates
- Certificates of Completion (CoCs) or Professional Engineering Certificates (PECs)
- Operating and maintenance manuals
- Spares catalogue
- Storage, packing and transportation instructions

3.3 As-built drawings, operating manuals and maintenance schedules

3.3.1 As-built Drawings

The Contractor provides “As Built” drawings/documentation for all his designs. The designs to embody all modifications made during construction/installation. “As Built” documentation to be provided for the entire project scope i.e. civil, mechanical, electrical and C&I works etc.

3.3.2 Operating Manuals and Maintenance schedules

The Contractor shall prepare and submit operating and maintenance manuals for all supplied equipment under this contract. The manuals to provide a detailed/complete record of information relating to the proper and safe operation and maintenance of the supplied items. The Contractor to submit the documentation to the Employer for review and acceptance. The Contractor to submit the operating and maintenance manuals prior conducting any testing or commissioning activities. The manuals shall provide comprehensive information on the following but not limited to:

a. Equipment technical data
b. Detailed drawings of supplied equipment
c. Operating philosophy of supplied equipment
d. Prescribed maintenance schedule or routine maintenance procedures/instructions per manufacturer requirements at the recommended service intervals
e. Commissioning procedures

4 Procurement

4.1 People

4.1.1 Minimum requirements of people employed on the Site

Eskom Holdings Limited’s requirements regarding employment of unskilled or semi-skilled workers are as follows:

Kusile Power Station requires that during recruitment of unskilled or semi-skilled labour, the Contractor or its subsidiaries should make every effort to employ minimum target as per SDL&I requirements. The Contractor shall under no circumstances be allowed to recruit labourer(s) at Kusile Power Station main security gate.
The Contractor’s employees shall undergo security screening/clearance obtainable from SAPS or MIE or any accredited institution.

4.2 Subcontracting

4.2.1 Preferred subcontractors

The Contractor may sub-contract specialised work and shall not subcontract more than a 25% of the value of the contract to any other entity that does not have an equal or higher B-BBEE status level of a contributor than the supplier concerned unless the contract is subcontracted to an EME that has the capability and ability to execute the subcontract work.

4.2.2 Limitations on subcontracting

The Contractor may sub-contract specialised work and shall not subcontract more than a 25% of the value of the contract to any other entity that does not have an equal or higher B-BBEE status level of a contributor than the supplier concerned unless the contract is subcontracted to an EME that has the capability and ability to execute the subcontract work.

4.3 Plant and Materials

4.3.1 Quality

a) The Contractor is responsible for defining the level of QA/QC (intervention Points) or inspection to be imposed on his Subcontractors and suppliers of material in the Quality Control Plans (QCPs).
b) The Contractor submits monthly, the following QA returns:

- A register of Defects with those older than 30 days being flagged, and an explanation attached.
- Register of accepted Defects
- A register of Non-Conformance Report
- Monthly Project Quality Report
- Monthly updated Site and pre-site programmes
- Inspection dates
- Site Acceptance Tests
- Inspections completed / outstanding

4.3.2 Spares and consumables

The Contractor shall provide operational spares when called for maintenance support.

4.4 Tests and inspections before delivery

It is the responsibility of the Contractor to ensure that the system is tested after installation/restoration to the satisfaction of the Employer's data quality requirements.

5 Construction

5.1 Temporary works, Site services & construction constraints

5.1.1 *Employer*'s Site entry and security control, permits, and Site regulations

All persons entering the Kusile Power Station site pass through the control points at the main access gate and are required to have temporary permits that are issued to Contractor‘s staff on request. All persons submit ID documents with the application for temporary permits. If it is necessary to bring equipment onto site a list is submitted which is verified by security staff prior to equipment entering the security area.

If any Contractor‘s staff are transferred from Kusile Power Station or leave site, the person’s permit is handed over to the Supervisor. The Contractor ensures that personnel leaving site are transported out of the security area and that the permit is returned.

No firearms, weapons, alcohol, illegal substances and cameras are permitted on site. Any person suspected of being under the influence of alcohol is tested and if proved positive, is refused entry to the security area.

No “private work” is carried out for or on behalf of any Eskom employee.

Under no circumstances shall the Contractor recruit outside Kusile Power Station’s security gate. An applicable local office for recruitment shall be used.

5.1.2 Restrictions to access on Site, roads, walkways and barricades

The generator area and the other units are barricaded and out of bounds and only authorised persons are permitted. Areas outside the site are out of bounds to the *Contractor*'s staff.

5.1.3 People restrictions on Site; hours of work, conduct and records

The *Contractor* keeps records of his people on Site, including those of his Subcontractors which the Project Manager or Supervisor have access to at any time. These records may be needed when assessing compensation events.

5.1.4 Title to materials from demolition and excavation

The *Contractor* has no title to materials from excavation and demolitions.

5.1.5 Cooperating with and obtaining acceptance of Others

The Contractor may be required to give or obtain access from Others during execution of the *Works*.

5.1.6 Publicity and progress photographs

The *Contracto*r shall not take any photographs on site without the *Employer*'s written permission.

5.1.7 *Contractor*'s Equipment

*Contractor'*s equipment shall be clearly marked, as tools and material need to be declared at the gate before entering the site, and the same declaration shall be used to remove equipment from site

5.1.8 Site services and facilities

The *Employer* shall provide power supply connection point in the form of 220V AC power, water, waste disposal skips. The *Contractor* shall provide everything else necessary for Providing the *Works*.

5.1.9 Facilities provided by the *Contractor*

The Contractor shall provide for his own Site accommodation, construction camps, storage, vehicles, office equipment and all other requirements deemed necessary for him to do site establishment. Upon completion of the contract, the *Contractor* shall do site de-establishment and restore the allocated are=1 `Xa to its original state.

5.1.10 Control of noise, dust, water and waste

Where there is work to be performed in the buildings occupied by personnel and noise and dust may be induced, it is the responsibility of the *Contractor* to inform the Project Manager for awareness and preparation to mitigate.

5.1.11 Hook ups to existing works

The Contractor shall ensure that work at height is:

- Properly planned.
- Appropriately supervised; and
- Carried out in a manner that is, as far as is reasonably practicable, safe and that its planning includes the selection of work equipment.

5.2 Completion, testing, commissioning and correction of Defects

5.2.1 Work to be done by the Completion Date

On or before the Completion Date the *Contractor* shall have done everything required to Provide the Works except for the work listed below which may be done after the Completion Date but in any case before the dates stated. The *Project Manager* cannot certify Completion until all the work except that listed below has been done and is also free of Defects which would have, in his opinion, prevented the *Employer* from using the *works* and Others from doing their work.

5.2.2 Use of the *works* before Completion has been certified

The *Employer* shall certify the *Works* before use.

5.2.3 Commissioning

The Contractor shall test, verify, and commission the equipment. The Contractor submits all drawings and data for the installed equipment to the *Project Manager*. Submit all relevant documentation (not limited to below):

- *Contractor's* Commissioning Procedure
- Full equipment list with applicable manuals
- Operating and maintenance manuals for equipment installed
- Commissioning and testing documentation
- Submit all the signed QCP and ITP documentation.
- Provide warranties and guarantees documentation for all installed equipment once work is completed

5.2.4 Take over procedures

Take over is after or at the same time as Completion. The *Employer* may require the *Contractor* to provide assistance, security personnel on a temporary basis etc.

5.2.5 Access given by the *Employer* for correction of Defects

The Employer shall arrange a Permit To Work to allow the Contractor to access and use part of the Works which has been taken over if needed to correct a Defect. After the Works have been put into operation, the Employer may require the Contractor to undertake certain procedures before such access can be granted.

5.2.6 Performance tests after Completion

Installation performance shall be assessed during the commissioning of each analyser. Each analyser shall be commissioned, and safety cleared individually. Site acceptance test and site integration test shall be performed for each analyser.

5.2.7 Training and technology transfer

The *Contractor* shall have training program which is structured to provide the Customer's attendees with sufficient knowledge to carryout engineering, operations and maintenance during the operational life of the detector system.

5.2.8 Operational maintenance after Completion

The Contractor shall provide 12 months of maintenance support, installation training and operational spares.

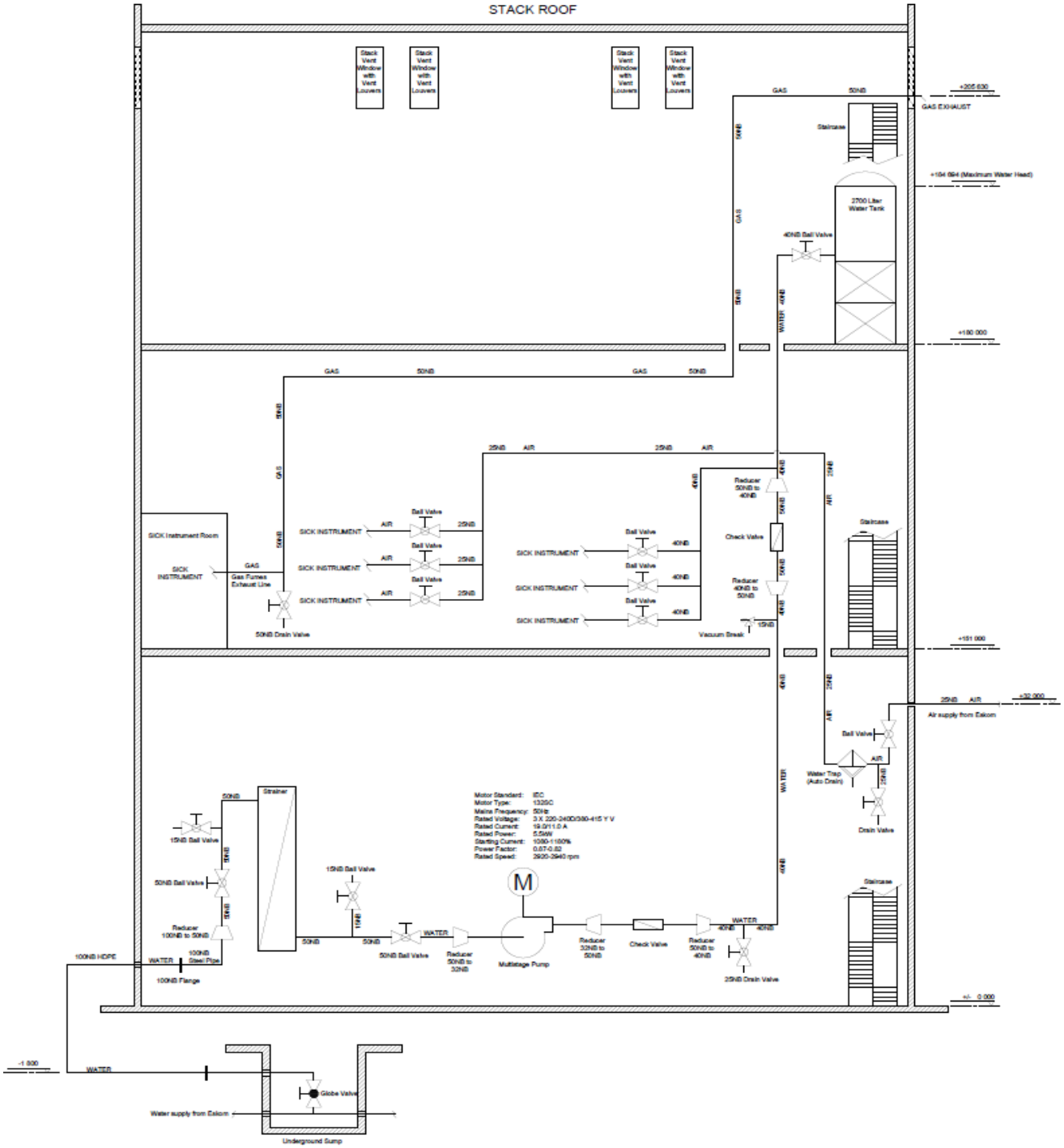
List of drawings

5.3 Drawings issued by the *Employer*

This is the list of drawings issued by the *Employer* at or before the Contract Date and which apply to this contract.

Note: Some drawings may contain both Works Information and Site Information.

APPENDIX A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Stack Vent Window with Vent Louvers
GAS
50NB
GAS EXHAUST
Staircase
2700 Liter Water Tank
40NB Ball Valve
WATER
SICK Instrument Room
SICK INSTRUMENT
Gas Fumes Exhaust Line
50NB Drain Valve
AIR
25NB
Ball Valve
Reducer 50NB to 40NB
Check Valve
Reducer 40NB to 50NB
Vacuum Break
15NB
Air supply from Eskom
Water Trap (Auto Drain)
Drain Valve
Strainer
15NB Ball Valve
50NB Ball Valve
Reducer 100NB to 50NB
100NB HDPE
100NB Steel Pipe
100NB Flange
Motor Standard: IEC
Motor Type: 132SC
Mains Frequency: 50Hz
Rated Voltage: 3 X 220-240D/380-415 Y V
Rated Current: 19.0/11.0 A
Rated Power: 5.5kW
Starting Current: 1090-1100%
Power Factor: 0.87-0.92
Rated Speed: 2920-2940 rpm
M
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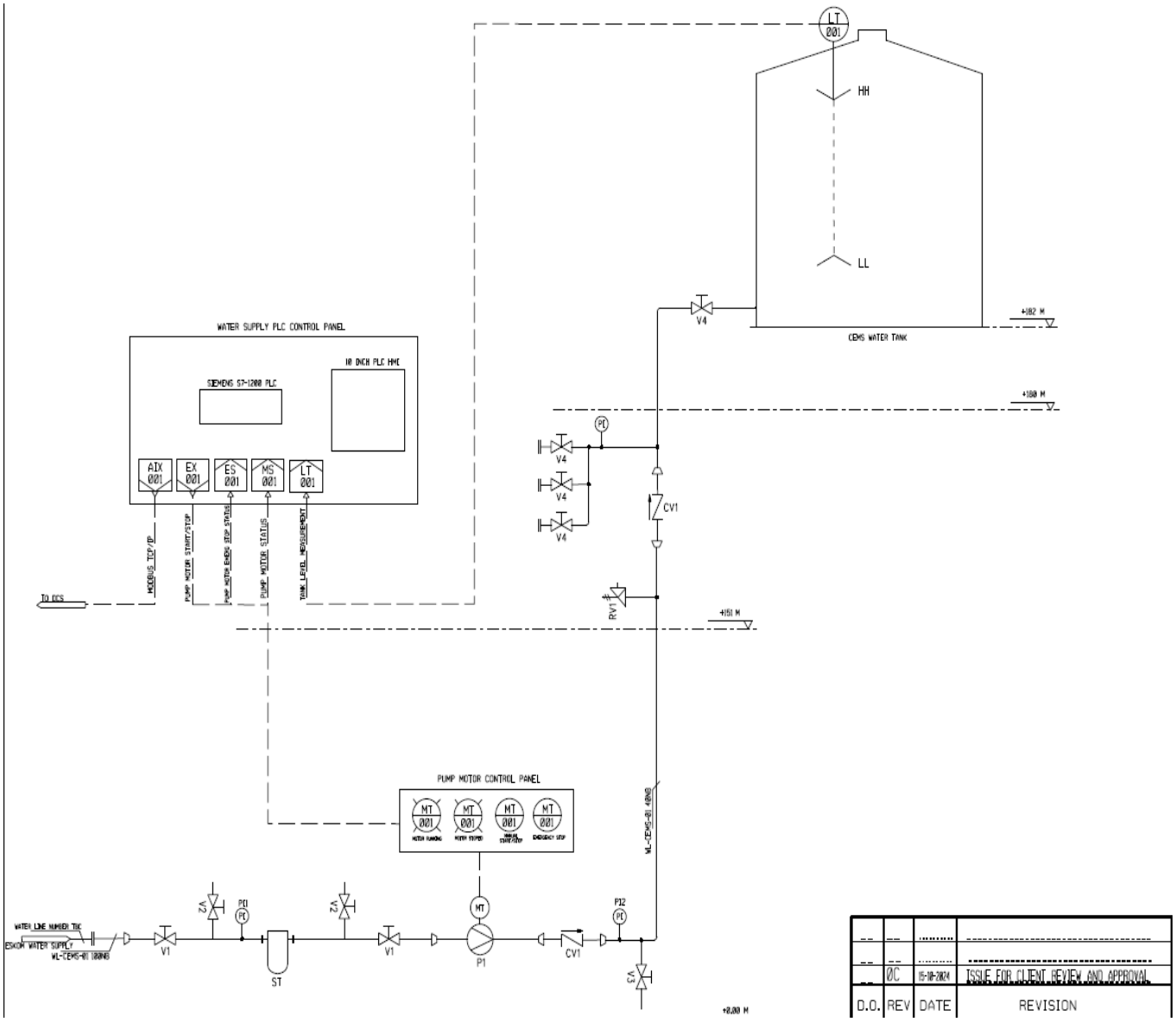
Reducer 32NB to 50NB
Reducer 50NB to 32NB
Reducer 50NB to 40NB
25NB Drain Valve
Globe Valve
Water supply from Eskom
Underground Sump



	ØC	15-10-2024	ISSUE FOR CLIENT REVIEW AND APPROVAL
D.O.	REV	DATE	REVISION