

## 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

The works is for the review, design, supply, refurbishment, modification, installation and commissioning of the lube oil system at the Vygeboom, Bosloop and Wintershoek pump stations of the Komati Water Scheme (KWS). The existing lube oil system is running with risks on certain components of the system. Some of the lube oil pumps and oil coolers are difficult to maintain due to unavailability of spares. The aim of this work is to replace these components and add eight motor bearings at Vygeboom and six motor bearings at Bosloop to the respective lube oil systems.

The current systems at all 3 pump stations (except Wintershoek 1-4) uses water cooled heat exchangers. All water-cooled heat exchangers must be replaced with air cooled units and located outside of the pump station buildings. All lube oil pumps must be replaced and preferably selecting the same pump for all the sites.

### Komati Water Scheme Overview

The three pumping stations with included lube oil systems are Wintershoek, Bosloop and Vygeboom which are in the Carolina and Badplaas areas respectively.

Five lube oil systems are part of the scope and listed below:

- Vygeboom 1-4
- Bosloop 1-3
- Bosloop 4-6
- Wintershoek 1-4
- Wintershoek 5-9

Each lube oil system consists of a lube oil tank, 2 lube oil pumps and motors (duty and standby), dual oil filter with manual change over valve, cooling system, supply and return pipework to and from the main pumps. See typical schematic layout below:

### Komati Water Scheme Typical Lube Oil System Layout

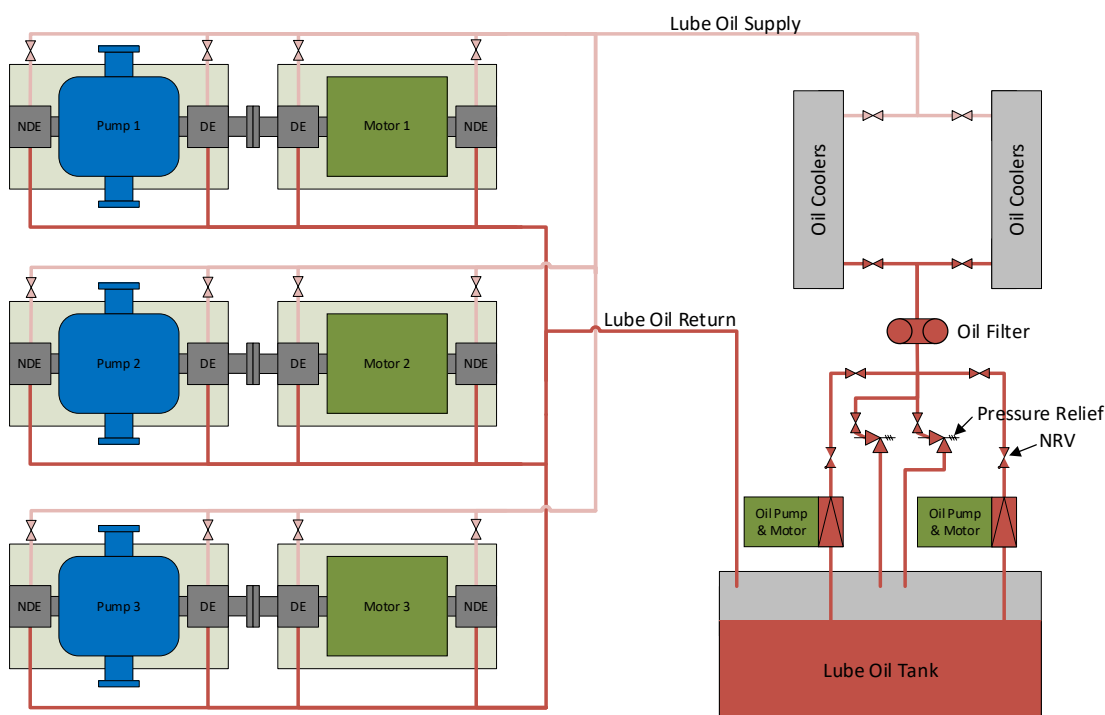


Figure 1 – Typical Lube Oil System Schematic

The following components must be replaced:

- Lube oil pumps and motors. The same pump and motor should be used at all the lube oil systems to ease spares holding and future maintenance.
- Oil filters with manual change-over facility
- The existing water coolers are replaced with a redundant air cooler system (1 duty and 1 standby) and should be located outside the pump station building next to or close to the lube oil system.
- Lube oil system control panel

The following components must be added to the lube oil systems:

- Vygeboom – drive end and non-drive end bearings for motors 1 to 4. Extend existing supply and return pipework from the pump
- Bosloop 1-3 – drive end and non-drive end bearings for motors 1 to 3. Extend existing supply and return pipework from the pump

Design and drawings

- Detail design of all the required changes included in a comprehensive design report.
- P&ID drawings of each system
- Layout drawings of each system

Documentation & Training

- Operation manual
- Maintenance manual
- Training for staff

## 1.2 **Employer's objectives and purpose of the works**

It is the *Employer's* objective to improve the pump station reliability on the Komati Water Scheme by replacing oil pumps and oil coolers as well as the adding of bearings to the lube oil systems at Vygeboom, Bosloop and Wintershoek pump stations.

## 1.3 **Interpretation and terminology**

If required include here definitions additional to those used in the *conditions of contract* which are required only for the purpose of making the Works Information easier to draft and read. Also list abbreviations used and provide a full interpretation of each one, for example:

The following abbreviations are used in this Works Information:

Abbreviation	Meaning given to the abbreviation
DE	Drive end
KWS	Komati Water Scheme
NDE	Non drive end
PM	Project Manager
SHEQ	Eskom Safety, Health, Environment and Quality

## 1.4 Vygeboom

Vygeboom pump station consists of 4 pumps and motors pumping into 2 pipelines to Bosloop reservoir with 2 pumps per pipeline running in parallel. All pumps are duty with no stand-by capacity. The current lube oil system only services the DE and NDE bearings of the pumps but not the motors. The DE and NDE bearings on the 4 motors has self-contained oil reservoirs and must be added to the lube oil system as part of this work. The lube oil supply and return pipework from the pumps must be extended and connected to the motor bearings.

The existing lube oil system make use of 2 oil coolers (1 duty 1 stand-by) that is cooled with water from the suction manifold. These water coolers must be replaced with 2 air coolers and be located outside the pump station building. Space next to the pump station building on the South-Western corner is available. This is next to the lube oil tank and pumps inside the building. The design of the oil coolers must include a concrete support structure for the oil coolers with an integral bund wall to contain any possible oil spill. The structure should also include a steel roof, steel fence and lockable gate around the oil coolers.

Component	Add / Replace	Number	Description
Lube oil pumps	Replace	2	Dual lube oil pumps configured to run as 1 duty and 1 stand-by with automatic change over between the pumps without substantial pressure loss in the system.
Lube Oil tank	Replace	1	
Oil filter	Replace	1	Dual oil filter with integrated change over valve to replace / clean the filter without stopping the system.
Oil coolers	Replace	2	Dual air-cooled oil coolers (1 duty and 1 stand-by) with integrated fans and manual change over valve to be located outside the pump station building.
Main motor DE and NDE bearings	Add	8	Additional 8 bearings from motors 1 to 4 to be added to the lube oil system. Existing supply and return pipework from pumps 1 to 4 to be extended to include the motors.
Flow control valves	Add	16	Flow control valves to be included for all existing and new bearings on the system
Flow control switches	Add	16	Flow control switches must be installed close to flow control valves. Wiring of the switches is excluded.
Control panel	Replace	1	A new lube oil system control panel must be installed according to the requirements in this document.

## 1.5 Bosloop 1-3

Bosloop Pump Station consists of 6 pumps and motors pumping into 2 pipelines to Nooitgedacht Dam with 2 duty pumps per pipeline running in parallel and 1 stand-by pump. Bosloop 1-3 lube oil system only services the DE and NDE bearings of pumps 1 to 3 but not the motors. The DE and NDE bearings on the 3 motors has self-contained oil reservoirs and must be added to the lube oil system as part of this work. The lube oil supply and return pipework from the pumps must be extended and connected to the motor bearings.

The existing lube oil system make use of 2 oil coolers (1 duty 1 stand-by) that is cooled with water from the suction manifold. These water coolers must be replaced with 2 air coolers and be located outside the pump station building. Space next to the pump station building on the South-Western corner is available. This is next to the lube oil tank and pumps inside the building. The design of the oil coolers must include a concrete support structure for the oil coolers with an integral bund wall to contain any possible oil spill. The structure should also include a steel roof, steel fence and lockable gate around the oil coolers.

Component	Add / Replace	Number	Description
Lube oil pumps	Replace	2	Dual lube oil pumps configured to run as 1 duty and 1 stand-by with automatic change over between the pumps without substantial pressure loss in the

Component	Add / Replace	Number	Description
			system.
Oil filter	Replace	1	Dual oil filter with integrated change over valve to replace / clean the filter without stopping the system.
Oil coolers	Replace	2	Dual air-cooled oil coolers (1 duty and 1 stand-by) with integrated fans and manual change over valve to be located outside the pump station building.
Main motor DE and NDE bearings	Add	6	Additional 6 bearings from motors 1 to 3 to be added to the lube oil system. Existing supply and return pipework from pumps 1 to 3 to be extended to include the motor bearings.
Flow control valves	Add	12	Flow control valves to be included for all existing and new bearings on the system
Flow control switches	Add	12	Flow control switches must be installed close to flow control valves. Wiring of the switches is excluded.
Control panel	Replace	1	A new lube oil system control panel must be installed according to the requirements in this document.

## 1.6 Bosloop 4-6

Bosloop Pump Station consists of 6 pumps and motors pumping into 2 pipelines to Nooitgedacht Dam with 2 duty pumps per pipeline running in parallel and 1 stand-by pump. Bosloop 4-6 lube oil system services the DE and NDE bearings of pump and motor sets 4 to 6.

The existing lube oil system make use of 2 oil coolers (1 duty 1 stand-by) that is cooled with water from the suction manifold. These water coolers must be replaced with 2 air coolers and be located outside the pump station building. Space next to the pump station building between the A and B pipeline manifolds is available. This is next to the lube oil tank and pumps inside the building. The design of the oil coolers must include a concrete support structure for the oil coolers with an integral bund wall to contain any possible oil spill. The structure should also include a steel roof, steel fence and lockable gate around the oil coolers.

Component	Add / Replace	Number	Description
Lube oil pumps	Replace	2	Dual lube oil pumps configured to run as 1 duty and 1 stand-by with automatic change over between the pumps without substantial pressure loss in the system.
Oil filter	Replace	1	Dual oil filter with integrated change over valve to replace / clean the filter without stopping the system.
Oil coolers	Replace	2	Dual air-cooled oil coolers (1 duty and 1 stand-by) with integrated fans and manual change over valve to be located outside the pump station building.
Flow control valves	Add	12	Flow control valves to be included for all existing and new bearings on the system
Flow control switches	Add	12	Flow control switches must be installed close to flow control valves. Wiring of the switches is excluded.
Control panel	Replace	1	A new lube oil system control panel must be supplied according to the requirements in this document.

## 1.7 Wintershoek 1-4

Wintershoek Pump Station consists of 9 pumps and motors pumping into 3 pipelines with 2 duty pumps per pipeline running in parallel and 1 stand-by pump. Wintershoek 1-4 lube oil system services the DE and NDE bearings of pump and motor sets 1 to 4.

Component	Add / Replace	Number	Description
Lube oil pumps	Replace	2	Dual lube oil pumps configured to run as 1 duty and 1 stand-by with automatic change over between the pumps without substantial pressure loss in the system.
Oil filter	Replace	1	Dual oil filter with integrated change over valve to replace / clean the filter without stopping the system.
Control panel	Replace	1	A new lube oil system control panel must be supplied according to the requirements in this document.

## 1.8 Wintershoek 5-9

Wintershoek Pump Station consists of 9 pumps and motors pumping into 3 pipelines to Arnot and Hendrina power stations with 2 duty pumps per pipeline running in parallel and 1 stand-by pump. Wintershoek 5-9 lube oil system services the DE and NDE bearings of pump and motor sets 5 to 9.

The existing lube oil system make use of 2 oil coolers (1 duty and 1 stand-by) that is cooled with water from the suction manifold. These water coolers must be replaced with 2 air coolers and be located outside the pump station building. The space next to the pump station building on the South-Eastern side is available. This is next to the lube oil tank and pumps inside the building.

Component	Add / Replace	Number	Description
Lube oil pumps	Replace	2	Dual lube oil pumps configured to run as 1 duty and 1 stand-by with automatic change over between the pumps without substantial pressure loss in the system.
Oil filter	Replace	1	Dual oil filter with integrated change over valve to replace / clean the filter without stopping the system.
Oil coolers	Replace	2	Dual air-cooled oil coolers (1 duty and 1 stand-by) with integrated fans and manual change over valve to be located outside the pump station building.
Flow control valves	Add	20	Flow control valves to be included for all existing and new bearings on the system
Flow control switches	Add	20	Flow control switches must be installed close to flow control valves. Wiring of the switches is excluded.
Control panel	Replace	1	A new lube oil system control panel must be supplied according to the requirements in this document.

## 1.9 Lube Oil Pumps

High quality fit for purpose helical gear pump and motors shall be selected for the works. The pumps must be easy to maintain and local support for spares and maintenance must be available. The same pump must be selected for all 5 lube oil systems.

## 1.10 Oil Coolers

Wintershoek pumps 1 to 4 currently uses Frigotherm Heat Exchangers (Type: FOT20) with a 62 l/min capacity. Same or similar heat exchangers must be used for all lube oil systems where new oil cooling systems are required.

Two heat exchangers shall be provided for each system with one duty and one standby. Manual change over valves must be provided next to the oil cooler installation.

New oil coolers must be installed outside the pump stations on ground level and next to the lube oil system on the inside. The oil coolers must be installed on a concrete base with an integral bund

wall that allows sufficient capacity to contain all the lube oil in each system should a leak occur at one of the coolers.

Each oil cooler installation shall include a steel roof, steel fence and lockable gate around the oil coolers.

### 1.11 Oil Filters

Dual oil filter to enable cleaning of the filter under live conditions is required. A single filter with two compartments and change over valve like the existing units must be provided.

### 1.12 Flow control valves

Suitable flow control valves shall be installed on the inlet line for each bearing (excluding Wintershoek 1-4). These valves will be used to adjust the flow to each bearing

### 1.13 Flow switches

Flow switches shall be installed on the inlet line for each bearing (excluding Wintershoek 1-4). Wiring of the switches to the control system is excluded from the scope.

### 1.14 Control Panel

New control panels must be designed and manufactured for each lube oil system. No programmable controllers shall be used in the design to operate the system. The following operating philosophy shall be incorporated:

- One lube oil pump is required to always run to keep the lube oil system pressurised. Lube oil pressure is one of the main pump interlocks and will prevent the main pumps to start if not pressurised.
- The two lube oil pumps shall operate in a duty and stand-by configuration and should the duty pump fail, the standby pump shall start immediately to maintain oil pressure.
- Only one pump shall be allowed to run at a time, even with the system selected to local control.
- Should a power failure occur, the duty pump shall automatically start once the power is restored.
- All analogue values shall be displayed using EUROTHERM panel display units (Model: 32H8i). These units are multifunctional and include functions like alarm, trip and signal relay that can be incorporated into the system design.
- The EUROTHERM unit's retransmit function to be wired to terminals (+ and -) for Telemetry inputs to monitor pumps, temperatures and pressure. A contact for status on the fans and pumps running and a system trip alarm or pressure trip.
- The following functions and displays shall be included on the control panel:

Function	Type	Description
Auto / Manual selection	Two position selector switch	Auto: Normal operation where one pump will always run with automatic change over to stand-by.  Local: Manual control – used by the operator to do maintenance – pumps can be stopped and started from control panel

Function	Type	Description
Duty pump selection	Two position selector switch	1: Pump 1 selected as duty pump and pump 2 as stand-by  2: Pump 2 selected as duty pump and pump 1 as stand-by  With system on Auto, this switch will change the running pump. With system on Manual, this switch will have no effect.
Pump control	1 start & 1 stop pushbutton for each pump	Used as start and stop buttons when system is on Manual
Pump running indicator	Indicator light	Green indicator light to light up while pump is running for each pump
Pump fault indicator	Indicator light and contact	Red indicator light to light up on pump fault for each pump and relay contact for relaying of the signal.
Oil tank level	EUROTHERM display	Display oil tank level in %. Alarm and trip values to be indicated on screen.  Alarm: 30%, Trip: 10%
Oil pressure before filter	EUROTHERM display	Display oil pressure in kPa before the filter
Oil pressure after filter	EUROTHERM display	Display oil pressure in kPa after the filter
Filter differential pressure alarm	Indicator light and contact	Red indicator to light up on a pre-set differential pressure and relay contact for relaying of the signal
Oil temperature before cooler	EUROTHERM display	Display oil temperature in °C before the oil coolers
Oil temperature after cooler 1	EUROTHERM display	Display oil temperature in °C after the oil cooler 1. EUROTHERM to be used to control cooler fan motor. On at 60°, off at 40°  Alarm: 70°
Oil temperature after cooler 2	EUROTHERM display	Display oil temperature in °C after the oil cooler 2. EUROTHERM to be used to control cooler fan motor. On at 60°, off at 40°  Alarm: 70°
Cooler fan running	Indicator light	Green indicator light to light up when fan is running for each cooler.
Cooler fan fault	Indicator light and contact	Red indicator light to light up when fan is faulty for each cooler and relay contact for relaying of the signal.
Emergency Stop	Switch	Emergency pull switch to stop the

Function	Type	Description
		running pump

## 1.15 Power Supply

Existing power supply connection from each pump station's 380V board shall be used to power the lube oil system. Local distribution and control for each system's electrical components shall be provided locally. The Contractor must confirm the suitability of the power supply in his design.

All electrical installation to conform to

- SANS 10142-1: The wiring of premises part 1: Low-voltage installations
- SANS1507: Electric cables with extruded solid dielectric insulation for fixed installations (300/500V to 1900/3 300 V). all applicable parts.
- SANS 1091: National colour standard
- 240-56356396: Earthing and Lightning protection Specification.

## 1.16 Electrical Motors

Electrical motors shall comply to:

- SANS 1804
- 240-56355466: Procurement of Power Station Low Voltage Motors.

## 1.17 Lube Oil Piping

The following standards are applicable to the works

240-123801640: Standard for Low Pressure Pipelines

240-56356376: On-Site Commissioning for Low Pressure Systems Standard

EN 13480 - All parts: Piping

240-105020315: Standard for Low Pressure Valves

# 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:
Kick off meeting	Project Managers request. On MS Teams or on site	Nooitgedacht/Vygeboom/ Bosloop Pump Stations or venue specified by PM	Employer, Contractor, Technical staff and end users, safety, and environmental staff.
Overall contract progress and feedback	Monthly on the 1 <sup>st</sup> Wednesday of each month at KWS sites or the next working day if the mention	Nooitgedacht/Vygeboom/ Bosloop Pump Stations or venue specified by PM	<i>Employer, Contractor, Supervisor, and other relevant parties</i>

	day is a Public holiday		
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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 verbal communication followed up with written confirmation.
- All written communication should be on formal letters with Corporate letter heads
- An email system is used for general communication
- Minutes of Meetings are held for all meetings relating to the project
- Communication is extremely important and is managed to ensure maximum benefits to the project.
- A document management system will be implemented.
- All communication to be directed to the *Project Manager*

## 2.3 Health and safety risk management

The *Contractor* shall comply with the health and safety requirements contained in the documents below:

#	Folder	Document Number	Document Title
1	SHE Documents	240-73416879	KWS Lube oil system SHE specification
2		240-128739857	Environmental Evaluation Criteria for KWS

## 2.4 Environmental constraints and management

- The *Contractor* conforms to the Eskom SHEQ policy, KWS environmental emergency and response work instruction, spill handling work instruction, environmental incident management and waste management work instruction. An environmental induction will be provided before the *Contractor* commence work on site.
- The *contractor* manages environmental impacts as identified in the environmental risk assessment.
- The *contractor* is responsible for safe disposal of the existing fence and associated components by ensuring that the fence and components are taken to the authorised recycling site. The waste manifesto from the receiving site must be submitted to Eskom/KWS Environmental Officer within 7 days.
- The following environmental requirements will be included in the Tender/Request for Proposal (RFP):
  - Environmental Risks Assessment as per scope of the project
  - Environmental costing as per the scope of the project.

A template for compiling risks assessment and example of the environmental costing is included on SHEQ Documents (see Appendix B).

## 2.5 Quality assurance requirements

Quality requirements will be negotiated and linked to contract award. Quality objectives are as follows:

- Contract Quality Plan Requirement as per Scope of works.
- Quality Control Plan (Inspection and Test Plan) Requirements as per scope of works.
- The supplier shall complete and sign Form A (Enquiry/Contract/Quality Requirements for QM58 and ISO 9001).

The supplier shall submit objective evidence of a developed and implemented QMS that complies with ISO 9001:2015 or any applicable standard of quality management system (the latest applicable revision). The following documents (approved copies) shall be submitted:

- (1) Quality management system manual or a document that is defined and describes the QMS and its scope
- (2) Quality Policy
- (3) Quality Objectives
- (4) Control of documented information
- (5) Records required by ISO 9001 standard (List of Records)
- (6) Internal audit procedure
- (7) Control of nonconformity outputs
- (8) Nonconformity and Corrective action procedure
- (9) Documented information for defined roles, responsibilities, and authorities
- (10) Documented information for Control of Externally Provided Processes, Products and Services
- (11) Latest copy of an internal management system audit report (with Nonconformity, Correction and/ or Corrective Action Reports)
- (12) Latest copy of an external management system audit report (with Nonconformity, Correction and/ or Corrective Action Reports)
- (13) Detailed objective criteria are attached in the Quality evaluation criteria form.

## 2.6 Programming constraints

Not applicable

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

The *Contractor* submits an organogram with updated CVs of each employee on the project.

Reporting structures and responsibilities are to be included on the organogram or in an addendum to the organogram.

## 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 addresses the tax invoice to ERI (Eskom Rotek Industries) invoicing email address:

invoicserilocal85@eskom.co.za or to the following address: The Project Manager, Eskom Rotek Industries SOC Ltd, Lower Germiston Road, Rosherville Johannesburg, P.O. Box 40698, Cleveland 2022 and include on each invoice the following information:

- Name and address of the Contractor
- The Contractor's Company name
- The Contractor's vendor number
- The Contractor Invoice number
- The Contractor's Order number
- The contract number and title.
- The Employer's registration number: 1990/006897/30
- Contractor's VAT registration number.
- The Employer's VAT registration number 4330196330
- 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.

Every 25th of each month, the Employer and Contractor will perform an assessment on the work completed for the month.

The assessment will be signed off by both parties.

The Contractor will submit an invoice to the Project Manager either hand delivery or a PDF document per email.

The Project Manager will submit the assessment with the invoice to Eskom Rotek Industries's Accounts Payable Section for payment.

## 2.9 Insurance provided by the *Employer*

First read ECC3 Core Clause 87.1 and then add anything necessary for the management of insurance related issues such as a cross reference to where procedures for making claims can be found. Also provide contact details for persons capable of being able to answer any insurance related queries the *Contractor* may have, as well as to whom the information required by Marine Insurance may be addressed.

Refer to Policy Number ESK 2015/6 ACAR.

## 2.10 Contract change management

All scope changes must be approved by the Project Manager.

## 2.11 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.

## **2.12 Records of Defined Cost, payments & assessments of compensation events to be kept by the *Contractor***

All project related documents to be kept in either electronic format or hard copies in files at the Contractor's premises.

## **2.13 Training workshops and technology transfer**

On completion of the works, Plant specific operating and maintenance philosophy training to be done with the Employer's staff. Three operators and one maintenance employee to be trained.

The Contractor is to supply all OEM manuals in A4 files which are clearly marked with the contract name and contract number

# **3 Engineering and the *Contractor's* design**

## **3.1 *Employer's* design**

Five lube oil systems are part of the scope and listed below:

- Vygeboom 1-4
- Bosloop 1-3
- Bosloop 4-6
- Wintershoek 1-4
- Wintershoek 5-9

Each lube oil system consists of a lube oil tank, 2 lube oil pumps and motors (duty and standby), dual oil filter with manual change over valve, cooling system, supply and return pipework to and from the main pumps. See typical schematic layout below:

### Komati Water Scheme Typical Lube Oil System Layout

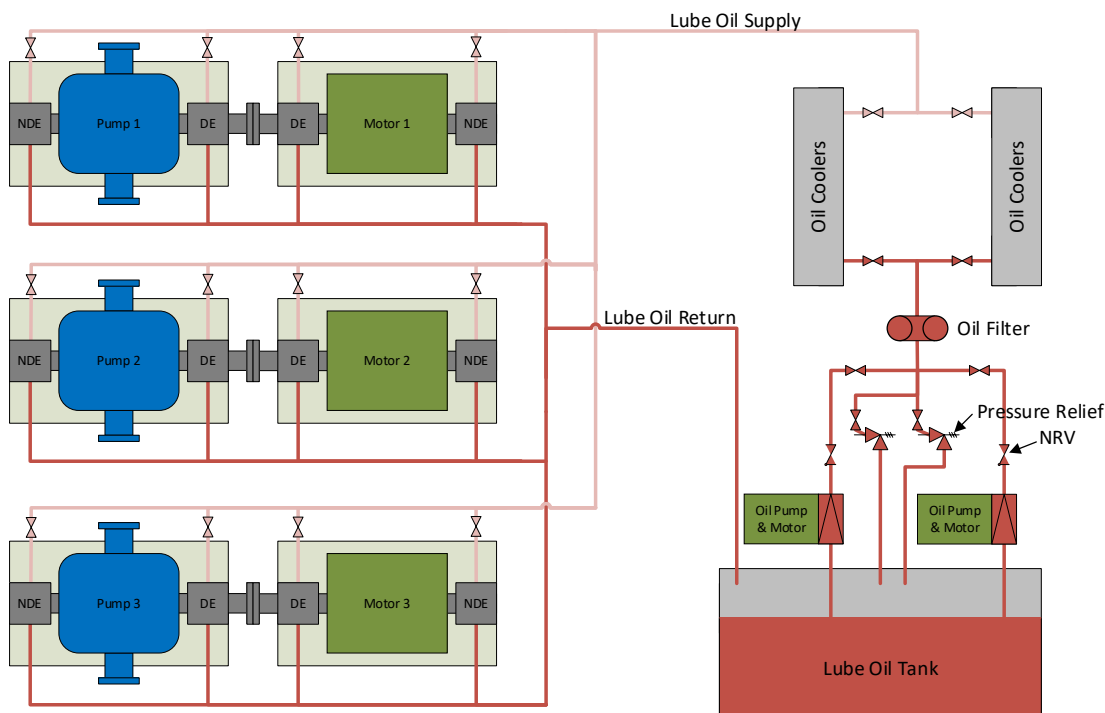


Figure 1 – Typical Lube Oil System Schematic

### 3.2 Parts of the works which the Contractor is to design

- 1) [21.1] The Contractor designs all of the works as described in the Works Information.
- 2) The Contractor design the works according to the relevant South African (SANS), British (BS) or other internationally accepted standards for all components or sub- components of the works. Reference to applicable standards are made on all design drawings and documentation describing the design. [21.1] [21.2] The Contractor takes the following into consideration in the design of the works:
  - size, mass or space limitations
  - design standards and codes of practice (with variations as applicable)
  - materials and workmanship specifications including references to standard codes and specifications
  - loading and capacity requirements
  - codification, labelling and configuration management
  - environmental constraints
  - operational performance requirements
  - design life and maintainability
  - other operational performance requirements.

The following components must be replaced:

- Lube oil pumps and motors. The same pump and motor should be used at all the lube oil systems to ease spares holding and future maintenance.
- Oil filters with manual change-over facility

- The existing water coolers are replaced with a redundant air cooler system (1 duty and 1 standby) and should be located outside the pump station building next to or close to the lube oil system.
- Lube oil system control panel

The following extensions must be added to the lube oil systems:

- Vygeboom – drive end and non-drive end bearings for motors 1 to 4. Extend existing supply and return pipework from the pump
- Bosloop 1-3 – drive end and non-drive end bearings for motors 1 to 3. Extend existing supply and return pipework from the pump
- Flow control valves and flow control switches as indicated.

Design and drawings

- Detail design of all the required changes included in a comprehensive design report.
- P&ID drawings of each system
- Layout drawings of each system

Documentation & Training

- Operation manual
- Maintenance manual
- Training for staff

### 3.3 Procedure for submission and acceptance of *Contractor's* design

- 1) The *Contractor* submits the design or part of the design to the *Project Manager* for acceptance. The designs are submitted in print and electronic format (PDF). The *Project Manager* may request the *Contractor* to submit design calculations.

### 3.4 Other requirements of the *Contractor's* design

Use this section to describe any particulars which must be taken into account by the *Contractor* in his design; for example codification (configuration management) of Plant and Materials.

KKS Requirements

### 3.5 Use of *Contractor's* design

The *works* is constructed using the accepted design.

The *Contractor* takes full professional accountability and liability for the *works* designed by the *Contractor* and provides the following to the *Employer*, for review and acceptance:

- A schedule (schedule with defined activities) for the *works* highlighting all activities involved, major milestones and provision.
- Detailed commissioning procedure indicating the tests to be conducted on the plant.
- Detailed drawings. Drawings are also submitted in CAD formats (.DGN)

- The Operating & Maintenance Manuals describe how the facility is to be operated/maintained and by whom. The operating and maintenance manuals as a minimum, consist of the following:
  - List of Contents (Index)
  - Introduction
  - General description of the functions of each of the systems including detailed description of each element of the lube oil plant, how it functions, how it operates and how to maintain it.
  - Full alarm descriptions with procedures on the fault finding or clearing of alarms.
  - Full as-built drawings, brochures and catalogues for the system and each component.
  - The format of the O & M documentation shall be A4 and shall be a specially bound document with hard cover and with metal ring binding. (All drawings and details shall be reduced to A3 format and folded into A4 format.)
  - The names address and telephone numbers/email addresses of all responsible persons and manufacturers/suppliers shall be listed in the O& M document.

Any discrepancy or ambiguity between the *Employer's* Specifications or requirements is immediately brought to the attention of the *Project Manager* for clarification.

### 3.6 Design of Equipment

On some complex projects requiring sophisticated temporary works, it could be in the Parties best interests that some details of the *Contractor's* design or proposed design of Equipment are shared with the *Project Manager*, not necessarily for his acceptance but as an assurance that the Equipment will be able to allow the *Contractor* to Provides the Works efficiently and without delay. For example a tunnel boring machine, or specialised shuttering for a bridge or caisson. Draft in such a way that there is no doubt that the liability for such design and use of the Equipment remains with the *Contractor*. Clause 23.1 is always available to the *Project Manager* if this section is not used.

### 3.7 Equipment required to be included in the works

The defined term 'Equipment' in core clause 11.2(7) makes a cross reference to the Works Information concerning any Equipment which the *Contractor* is required to include in the *works*. Complete here or if not applicable either delete the heading or retain the heading and state 'None'.

### 3.8 As-built drawings, operating manuals and maintenance schedules

Use this section to describe these requirements. Pay particular attention to when and in what form they are required. Consideration should be given to obtaining operating manuals and maintenance schedules before Completion of the whole of the *works* when there is still considerable financial incentive for the *Contractor* to do so.

## 4 Procurement

### 4.1 People

#### 4.1.1 Minimum requirements of people employed on the Site

Local employees to be employed as far as reasonably practicable.

#### 4.1.2 BBBEE and preferencing scheme

The standard Z3 Clause included in this contract is applicable

#### 4.1.3 Accelerated Shared Growth Initiative – South Africa (ASGI-SA)

The *Contractor* complies with and fulfils the *Contractor's* obligations in respect of the Accelerated and Shared Growth Initiative - South Africa in accordance with and as provided for in the *Contractor's* ASGI-SA Compliance Schedule stated below

[Insert the agreed ASGI-SA Compliance Schedule here]

The *Contractor* shall keep accurate records and provide the *Project Manager* with reports on the *Contractor's* actual delivery against the above stated ASGI-SA criteria. [Elaborate on access to and format of records and frequency of submission etc.]

The *Contractor's* failure to comply with his ASGI-SA obligations constitutes substantial failure on the part of the *Contractor* to comply with his obligations under this contract.

#### 4.1.4 Supplier Development & Localisation

The *Contractor* shall respond to the Annexure K document provided by the *Employer* in addressing the Supplier Development & Localisation matters and provide the Service Manager with reports on the Contractor's actual delivery against the above stated SD&L criteria.

The Contractor's failure to comply with his SD&L obligations constitutes substantial failure on the part of the Contractor to comply with his obligations under this contract.

### 4.2 Subcontracting

#### 4.2.1 Preferred subcontractors

*Contractor* to inform the *Employer* if any subcontractors are appointed.

#### 4.2.2 Subcontract documentation, and assessment of subcontract tenders

Not applicable.

#### 4.2.3 Limitations on subcontracting

Contractor informs the Employer if any subcontractors are appointed. Subcontractors will be required to comply with all Eskom specifications.

#### **4.2.4 Attendance on subcontractors**

Contractor to inform the Employer if any subcontractors are appointed.

### **4.3 Plant and Materials**

#### **4.3.1 Quality**

As per quality requirements document QM – 58 Supplier contract quality requirements specification.

#### **4.3.2 Plant & Materials provided “free issue” by the *Employer***

The Employer provides:

Water and electrical supply are available on site.

#### **4.3.3 *Contractor's* procurement of Plant and Materials**

All Plant & and Materials supplied by the Contractor must comply with the Employer's quality Requirements.

All test certificates and quality inspection documents to be included in the O&M manuals

Materials to be sourced locally as far as possible.

#### **4.3.4 Spares and consumables**

Contractor to supply a list of all spares and consumables. The life cycle of the product must be further supported in terms of spares availability for a minimum period of seven (7) years after discontinuation of the product.

### **4.4 Tests and inspections before delivery**

The Contractor is responsible for all necessary tests and inspections before delivery to ensure successful testing and construction of the works.

### **4.5 Marking Plant and Materials outside the Working Areas**

The Contractor submits evidence, during the tender phase, that plant and equipment meet the specifications defined in the Works Information

The demonstration tests are locally based at a suitable venue arranged by the Contractor.

The Contractor arranges a time, date and venue with the Project Manager.

The Employer requires representation during the demonstration tests to confirm and accept the plant and equipment has met the requirements of the Employer.

The demonstration test allows for one retest/retune/reconfiguration of plant

## **5 Factory Acceptance Test**

1. The *Contractor* submits factory acceptance test procedures
2. The factory acceptance tests are locally based at a suitable venue arranged by the *Contractor*.
3. The *Contractor* arranges a time, date and venue with the *Project Manager*.
4. The *Employer* requires representation at the acceptance tests to confirm and accept the plant and equipment has met the requirement of the *Employer*.

### **5.1 Contractor's Equipment (including temporary works).**

The Contractor is liable for all plant & equipment in the designated area under his control. The Employer will not take any responsibility for any loss or damage to the equipment.

### **5.2 Cataloguing requirements by the Contractor**

Material to be purchased according to the specifications provided by the *Employer*.

## **6 Construction**

### **7 General**

The *Contractor*:

Adheres to the South African Environment Protection Act, the waste management code of practice and the South African Occupational Health and Safety Act No. 85 of 1993, the regulations promulgated thereunder and Eskom Safety, Health, Environment and Quality (SHEQ) Policy 32-727 and Waste Management Procedure, as well as the plan from KWS for all *works*.

Submits to the *Project Manager* a construction method for acceptance 2 weeks prior to any construction activities commencing on site. The method statement must cover, not limited to, the following areas of construction:

1. Submit a project specific safety file to the *Employer* for acceptance, prior to the start of the *works*.
2. Submit a detailed schedule for the *works* to the *Project Manager* for acceptance after contract award.
3. Manage his activities on *Site* to ensure that no interference takes place between his work and that of others.
4. Continuously monitor the condition in demolition areas and surrounding areas for any hazardous substances and in such case, the *Contractor* is required to take necessary precautionary measures.
5. Complete "Contract Activities Daily Reports".
6. Liaise with the *Supervisor* regarding utilities and telephone facilities required for his *Site* establishment.
7. Identifies a registered waste disposal site, outside the pump station for dumping of waste, which must be approved by the *Supervisor*.

8. Maintain and promote labour harmony on the Site and in the working environment.
9. Immediately report any potential labour disharmony to the *Supervisor*.
10. Not recruit or employ any personnel from the *Employer* and Others, without prior acceptance of the *Project Manager*.

## **7.1 Temporary works, Site services & construction constraints**

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

1. The contractor abides by security protocols and access control procedures.
2. Alcohol testing will be conducted at any time on all employees entering the Eskom premises. All staff that tested positive for alcohol abuse will not be allowed on site.
3. The contractor will undergo plant Induction.
4. When entering the site, the contractor or visitors will be requested to come out from their vehicle in front of the gate and identify them self by means of ID card/document.
5. The contractor/visitor will be always subjected to be search before entering the site.
6. The contractor shall have their tools list when entering the site.
7. The contractor will be requested to fill in the register when entering site.
8. The contractor will strictly follow safety rules.

### **7.1.2 Restrictions to access on Site, roads, walkways and barricades**

1. All vehicles must comply with the National Road Traffic Act, 1996 (Act No. 93 Of 1996)
2. Vehicle inspections will be conducted daily and check sheets must be kept at the Contractor's offices.
3. The contractor is restricted from entering the plant (Pump Station, Switchgear Room, Distribution Yard etc.) without authorisation by the Project Manager or Employer's representative. The following is prohibited:
  - Firearm not allowed on site.
  - No alcohol on site.
  - Not making fire on site.

### **7.1.3 People restrictions on Site; hours of work, conduct and records**

1. Restrictions and hours of work may apply on Sites.
2. It is very important that the Contractor keeps records of his people and plant 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.
3. No weekend work is permitted without the acceptance of the Project Manager/Employer and Contractor's working hours will be aligned from 07:00 to 12:00 and 12:30 – 16:30 from Monday to Friday. Health and safety facilities on Site
4. The Contractor to supply the following for his employees:

- Job Specific Safety training
- Personal Protective Equipment
- Toolbox talks
- Safety Representatives to be trained for all areas of the works.
- Qualified First aiders to be appointed for all areas of the works.

#### **7.1.4 Health and safety facilities on Site**

In addition to the requirements of the laws governing health and safety, Eskom may have some additional requirements particular to the service and the Affected Property for this contract. The Contractor shall comply with the Environmental Management Systems:

The Contractor carries out the works in compliance with Occupational Health and Safety Act of 1993 (as amended) and all applicable Eskom Environmental, Health and Safety policies and procedures.

The Contractor is responsible for obtaining all accreditations and training required to carry out the works. The Contractor implements and maintains active site safety and an accident prevention program in accordance with Eskom's Safety Regulations as laid down by the applicable Safety Manuals.

The Contractor liaises with the Project Manager and is responsible for cordoning off work areas with solid barricades and the erection of warning signs to prevent access by others working on the premises.

Identifies and reports emerging risks to The Employer on a weekly basis.

Identifies and reports on quality related issues.

The Contractor shall comply with the health and safety requirements that will be sent by Health and safety department.

#### **7.1.5 Environmental controls, fauna & flora, dealing with objects of historical interest**

Not applicable.

#### **7.1.6 Title to materials from demolition and excavation**

Not Applicable

#### **7.1.7 Cooperating with and obtaining acceptance of Others**

The Contractor will interact with the following stakeholders:

- Primary Energy representatives – end users
- Eskom Rotek Industries Bulk Material Services representatives – Site management
- Department of Water Affairs and Sanitation (DWS)
- Internal and external auditors

#### **7.1.8 Publicity and progress photographs**

1. SHE requirements must be clearly identified on notice boards.

2. A complaints register must be maintained. The Contractor shall seek Employer's approval prior to engaging with the authorities.
3. No pictures will be taken without the written authorisation of the Project manager.

#### **7.1.9 Contractor's Equipment**

1. The Contractor submits a list of all tools and equipment when entering site. Equipment and tools not declared will become the Employer's property.
2. On completion of the project, all tools and equipment will be removed only with permission from the Project Manager on the applicable approved Employer documents.

#### **7.1.10 Equipment provided by the Employer**

Provide details of equipment made available for use by the employer and set out conditions relating thereto.

Water and electricity will be provided by the employer.

#### **7.1.11 Site services and facilities**

This is a mandatory cross reference from clause 25.2 in ECC3. State what the *Employer* will provide in the way of power, water, waste disposal, telecomms, ablutions, fire protection, lighting etc. Give hook up locations and any constraints on how the hook up is to be done. Always conclude by stating that the *Contractor* shall provide everything else necessary for Providing the Works.

The Employer will provide power, potable water and ablution facilities for the Contractor to use whilst on site when the work is taking place in the pump station.

#### **7.1.12 Facilities provided by the Contractor**

Describe what the *Contractor* is to provide in the way of Site accommodation, laboratories, storage, vehicles and office equipment etc for the *Project Manager* and the *Supervisor*, and any restrictions or minimum requirements concerning the *Contractor's* own facilities. State requirements for facilities to be provided by the *Contractor* such as construction camps. Also state what happens to these facilities upon completion of the contract. Set out constraints, if any, as to the location by the *Contractor* of such facilities on the Site and requirements for drawings of Site facilities, as necessary.

The contractor provides accommodation for his /her team. No accommodation will be allowed on site except for the provision of temporary security guards who will be accommodated at the existing security building. For the duration of the project on site, the Contractor will be responsible for the following: The supply of a mobile generator suitable for cutting and welding on site.

Welding and cutting machines.

Lifting machine and lifting tackle in line with "Driven Machinery regulation"

Drinking water and portable toilets since the work would be done at an open veld.

All drivers' fitness to operate specified vehicles and licenses to be always available for inspections by the Employer.

The Contractor provides temporary office space for the duration of the contract for Contractor employees at the site where the works is executed.

All equipment must comply with the OHSAct.

#### **7.1.13 Existing premises, inspection of adjoining properties and checking work of Others**

Details under this sub-paragraph are very contract specific and may be quite extensive in some cases. State requirements for the inspection with the owners of adjacent buildings and properties and representatives of local authorities before commencing with the *works* that have the potential to damage surrounding buildings

and property. State whether *Contractor* is required to inspect the work of Others to which he is required to connect and if so by when to avoid delays to his work.

The Contractor is expected to assess the conditions and state of the existing infrastructure on the respective sites. This inspection is to be conducted before work commences so that the Employer may be made aware of any defects or modifications that are required to be carried before the work commences.

It is also incumbent on the Contractor to inform the Employer in writing if any of the work that is to be conducted has the potential to damage property on the sites. The Employer will then inform the Contractor on how to proceed with the works in such instances.

#### **7.1.14 Survey control and setting out of the works**

Provide information on survey controls established by the *Employer*, if any, and state requirements for survey control and the setting out of the works.

Not Applicable

#### **7.1.15 Excavations and associated water control**

State any particular requirements for handling deep foundations and controlling water from excavations.

Not Applicable

#### **7.1.16 Underground services, other existing services, cable and pipe trenches and covers**

Describe known services making reference to drawings containing known services and state requirements for locating, marking and recording such services.

State requirements for the treatment of existing services i.e. their termination, diversion or continued use, either temporarily or permanently, and set out the procedures relating thereto.

State requirements, as necessary, for the use and availability of detection equipment for the location of underground services.

State responsibility for damage to services, known and unknown, and requirements for working in close proximity to services etc.

State requirements and reinstatement procedures for the notification and repair of damage to services and any penalties applicable to the damage of services.

#### **7.1.17 Control of noise, dust, water and waste**

State requirements, if any.

To be included in Risk Assessment.

As per authorisations and the Employers policies, procedures and work instructions.

#### **7.1.18 Sequences of construction or installation**

Only prescribe sequences of work where absolutely necessary such as when *Contractor* has to give access to Others (without take over) and for technical reasons such as under tidal conditions and in rivers.

The Contractor will commence with the Works at the affected pipeline for that moment.

#### **7.1.19 Giving notice of work to be covered up**

State the procedure for notifying the *Supervisor*

All intended activities must be captured in the scope of work and also on the project schedule. The project schedule will be reviewed and updated weekly by the Project Manager.

### 7.1.20 Hook ups to existing works

State any constraints

Not applicable

## 7.2 Completion, testing, commissioning and correction of Defects

### 7.2.1 Work to be done by the Completion Date

**This is mandatory.** Core clause 11.2(2) defines Completion as when the *Contractor* has done all the work which the Works Information states he is to do by the Completion Date. Rather than list all work to be done by the Completion Date, state that all work is to be done by the Completion Date except for [●]. For example:

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.

	Item of work	To be completed by
	As built drawings of All plant	Within 30 days after Completion of each site.
	Performance testing of the <i>works</i> at each site	Various completion days as per particular test specified in the specification.

### 7.2.2 Use of the *works* before Completion has been certified

Clause 35.2 in ECC3 provides that the *Employer* may use any part of the *works* before Completion has been certified but if he does so he takes over the part of the *works* except if the use is for a reason stated in the Works Information. State the reason here if this applies.

The Employer will not make use of the works before it has been certified to be complete.

### 7.2.3 Materials facilities and samples for tests and inspections

State what materials facilities and samples for tests and inspections the *Contractor* and the *Employer* are to provide, per core clause 40.2.

### 7.2.4 Commissioning

Required mainly for contracts including mechanical and electrical work. Would typically refer to detailed commissioning procedure attached as an Annexure. Confirm whether commissioning is to be done before or after Completion. If after Completion, include this item of work in the list in sub-paragraph 7.2.1 above.

The Contractor will then be responsible for the commissioning of the plant upon completion of the installation. The Contractor must develop a commissioning procedure which will be used to commission the plant and hand this over to the Employer.

The Contractor and the Employer must sign and accept the quality control plan once all the plant equipment has been installed. Once the quality control plan has been accepted by both parties the Contractor and Employer commission the plant together and ensure that the plant operates as per the design.

#### 7.2.5 Start-up procedures required to put the *works* into operation

In order to put the *works* into operation the *Employer* may require the *Contractor* to either do this for him or be in attendance whilst he does it, depending on who is the responsible person. State requirements of the *Contractor* here together with any special arrangements associated with operating plant and machinery.

#### 7.2.6 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.

1. The Contractor compiles data packs progressively for all manufacturing and construction/erection inspection, operating manuals and test records and documents for every piece of plant worked on. The Contractor submits data packs to the supervisor and Project Manager for their review for all equipment and works undertaken with the applicable requirements and specifications.

2. Apart from any statutory data packages required, the Contractor also compiles and signs off a data package of the relevant drawings, test certificates etc. to the Project Manager for acceptance. These include, but are not limited to:

- Surveys;
- Approved ITP's, QCP's;
- Method statements and specifications adhered to;
- Risk assessments;
- Approved Drawings;
- Design Calculation Reports
- Fabrication Drawings;
- Material Certificates;
- Certificate of Manufacture;

#### 7.2.7 Access given by the *Employer* for correction of Defects

Clause 43.4 requires that the *Project Manager* arranges for the *Employer* to allow the *Contractor* access to and use of a 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 (for example barricading a motorway or in a nuclear power station). Include these here.

Access shall be granted to the Contractor for correction of Defects by the Project Manager.

#### 7.2.8 Performance tests after Completion

Many design and build or turnkey projects require the *Contractor* to demonstrate that the *works* can operate as guaranteed by the *Contractor* (in *Contractor's* Works Information) or specified by the *Employer* either here or elsewhere in this Works Information. State here the procedures for carrying out such proving tests. These details should link up with any performance levels stated in Contract Data if secondary Option X17 in ECC3 applies.

Performance tests are done by the Contractor before sectional completion of the works as per the described execution methodology.

### 7.2.9 Training and technology transfer

On completion of the works, Plant specific operating and maintenance philosophy training to be done with the Employer's staff. Three operators and one maintenance employee to be trained.

The Contractor is to supply all OEM manuals in A4 files which are clearly marked with the contract name and contract number

### 7.2.10 Operational maintenance after Completion

The *Employer* may require the *Contractor* before the *defects date* to perform certain duties after Completion and take over which relate to maintenance of the *works*. (Not to be confused with Defect correction) For example oil and filter changes

Not Applicable

## 8 Plant and Materials standards and workmanship

This section of the Works Information contains all the specifications for the work which is left behind; the permanent works. It is likely to be the largest section by far and may even be compiled in volumes, e. g. Section 6 Volume 1: Civil Engineering Works. In design and construct contracts, it may be compiled in accordance with systems within the *works*; e. g. Section 6 Volume 4: Crushers.

Because practice varies widely between employers it is not practical in a general template such as this to deal with all arrangements. Only the discipline based section subheadings are provided below in the order the *works* are likely to be constructed together with some notes of a general nature.

### 8.1 Investigation, survey and Site clearance

Some contracts may require the *Contractor* to carry out further investigation of existing facilities or of the Site before commencing final design. There could be constraints on Site clearance especially in pipeline or transmission grid servitudes.

The Contractor is expected to survey the Site before work commences to ensure that the design of the works is conversant with the site that it is designed for.

### 8.2 Building works

Reference could be made to the latest Model Trade Preambles published by the Association of South African Quantity Surveyors. However these have been developed for use with the JBCC series of contracts and an approach where description of the work is made part of the bill of quantities, which is not the case in other forms of contract. Only parts of the Model Trade Preambles could be referenced by an ECC contract, with a covering note dealing with the changes in terminology. Further changes are required depending on which parts are to be selected.

This subsection would typically comprise

- a) Particular specifications provided by the *Employer*
- b) List of standardised specifications applicable to the *works* and
- c) Variations to the standardised specifications

### 8.3 Civil engineering and structural works

Reference could be made to the SANS1200 series of specifications developed and published by South African National Standards. However these are now very out of date and originally developed for use with SAICE general conditions of contract for works of civil engineering which have themselves been superseded twice.

All SANS 1200 specifications are in the process of being updated to make them more compatible with a wider range of contracts, including NEC, and users should check availability of the new SANS 2000 series of specifications.

Sections 3, 4 and 5 of SANS1200A are probably already covered in section 5 of this Works Information.

This subsection would typically comprise

- a) Particular specifications provided by the *Employer*
- b) List of standardised specifications applicable to the *works* and
- c) Variations to the standardised specifications

If use is made of the 1200 series, users should include a covering note dealing with the changes in terminology, such as the one provided below. Further changes are required depending on which specifications in the 1200 series are selected.

The Contractor is required to adhere to the latest editions of, and the normative references within, the following SANS, codes of practice, regulations & standards:

#### 8.4 Electrical & mechanical engineering works

These specifications are usually project specific and developed by the *Employer* to suit his operations. Either include these specifications here, or refer to them in attached Annexure.

Check the specifications for inconsistencies in terminology and that they do not contain any provisions already dealt with in the chosen NEC *conditions of contract* or clash with them in any way.

#### 8.5 Process control and IT works

These specifications are usually project specific and developed by the *Employer* to suit his operations. Either include these specifications here, or refer to them in attached Annexure.

Check the specifications for inconsistencies in terminology and that they do not contain any provisions already dealt with in the chosen NEC *conditions of contract* or clash with them in any way.

#### 8.6 Other [as required]

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.

9 List of drawings

9.1 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.

Drawing number	Revision	Title

## C3.2 **CONTRACTOR'S WORKS INFORMATION**

This section of the Works Information will always be contract specific depending on the nature of the *works*. It is most likely to be required for design and construct contracts where the tendering contractor will have proposed specifications and schedules for items of Plant and Materials and workmanship, which once accepted by the *Employer* prior to award of contract now become obligations of the *Contractor* per core clause 20.1.

Typical sub headings could be

- a) *Contractor's* design
- b) Plant and Materials specifications and schedules
- c) Other

Compiled by: Lindiwe Nkonde

Signature...  .....

Date: 15/10/2025 .....