PART 3: SCOPE OF WORK

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C3.1: EMPLOYER'S WORKS INFORMATION

Contents

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1 Description of the *works*

1.1 Executive overview

Crossover plant is a plant area for oil and water separation. There is a combination of six different plant areas. Although the areas are not centralized in one specific place, they are linked from a process point of view.

The six areas are as follows:

- Bypass connection between boiler blow-down line and dirty water line.
- Recovered water sump.
- Berm system at dirty water dam
- Thickener, Coalesces and inlet structure.
- Auxiliary Cooling Water.
- Side-stream filtration.

Clean Water Drain and dirty Water Drain to the new inlet structure.

- Thickener.
- Coalesces.

The inlet structure is divided into two separate compartments, one for clean water and one for dirty water. On the clean water side there is a fixed bar screen, a measuring flume for flow measurement and a built-in overflow facility for excess flow conditions. On the dirty water side there is only fix bar screen and a built-in overflow facility. The dirty water flume is located just downstream before the inlet to the thickener.

An open channel provides the normal flow route to the thickener. On the overflow side for the dirty water from the inlet structure, the overflow connects to the existing 1500NB concrete pipe. The thickener is circular and 30m in diameter. In order to utilize the available falls for gravity feed, the thickener had to be sunk to the ground. A sloping tunnel provides access to the central underflow outlet, the centrifugal sludge pumps, and the sump pumps.

The four existing coalesces have been modified and now contains horizontal - flow coalesces packs for oil and sludge separation. Solids will settle downwards to form sludge, and this will be pumped to the drying beds. Oil will move to the surface and can then be collected in the manually operated horizontal pipe skimmer. This pipe skimmer will convey the oil/oily water to the oil sump by gravity.

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

The main objective and purpose of the *works* is to support full functionality of the cross over plant

The following is a record of the replacement/equipment/systems that are required:

a) Thickener refurbishment including the steel structure
b) Concrete repairs on the drying beds and the thickener outlet and inlet trenches
c) Refurbishment of the oil separation system
d) Refurbishment of the clarifier underflow pumping system
e) Replacement of the defective isolation sluice gates

1.3 Interpretation and terminology

Terminology	Meaning of Terminology
"AS IS"	Current status of the plant taking into consideration the modifications done since it was built.
"AS BUILT"	Original status of the plant after commissioning before there were any modifications.
Common Plant	The services common to all units and any other plant which is not applicable to unit operation. This includes outside plants.
Station or Power Station	Kendal Power Station

The following abbreviations are used in this Works Information:

Abbreviation	Meaning given to the abbreviation
AFC	Approved for construction
OBL	Outside battery limits

2 Management and start up.

2.1 Management meetings

Management meetings of general and specialised nature will be held on weekly basis between the *Project Manager* and the *Contractor* as well as any person instructed by either party to attend.
The purpose of meetings is to proactively and jointly manage the administration of the contract with the objective of minimizing the adverse effects of risks.

Amongst other topics meetings will be platforms to discuss:

- Health, Safety and quality matters associated with the works or related to the works
- Main responsibilities of parties
- Engineering and design management
- Contractors activities progress including progress of any other relevant activities or inputs to the project
- Methods statement
- Payments
- Defects, NCR's and corrections of defects
- Interfaces with others
- Subcontracting
- Compensation events
- Titles as per core clause7
- The risk register as well as applicable strategies associated with management of those risks.
- Commercial issues
- Challenges
-

The *Project manager* may instruct the *Contractor* to attend meetings with other Contractors and/or stakeholders not stated in this contract. The *Contractor* is given sufficient notice before attending such meeting which does not constitute a compensation event.

The venue of these meetings is as determine by the *Project manager*. The *Project manager* writes the minutes of the meetings and circulates to attendees within five working days.

Any action of the *Project manager* and the Contractor implied in the minutes of the meetings is confirmed by a separate formal communication between the *Project manager and the Contractor.*

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:
Risk register and compensation events	Monthly on _Tuesdays_ at _10:00	Kendal Power Station	Contractors representative and Eskom project manager
Overall contract progress and feedback	Weekly on _Tuesdays day at 11:00	Kendal Power Station	*Employer*, *Contractor*, *Supervisor*, and all parties involved
Health and safety meetings	Daily	Kendal Power Station	Contractors representative and Eskom project manager

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

2.2.1 Information Requirements

The *Employer* requires drawings, documentation, plans, information and data (collectively "Information") from the *Contractor* for various fundamental purposes including but not limited to the following:

a) Management and execution of the *works*
b) Installation and commissioning of the *works*
c) Technical support for the *works* during its entire operational phase until decommissioning and disposal
d) Operation and maintenance

The *Contractor* supplies, during the progress of and upon Completion of the *works*, the information called for in the Contract and or Works Information and all such information as may usually be supplied in connection with work similar in nature to the *works* and the interface and required integration of the *works* with the Plant provided and Material by Others including but not limited to all information necessary or useful for:

a) Design reviews and the interface management of the *works* with the overall project.
b) Quality assurance and control, construction, commissioning, testing and setting to work of the *works.*
c) The operation, maintenance, support, inspection, integrity management, training and technical optimisation of the *works*, over the lifecycle thereof.

Same as otherwise provided for in the contract, information is supplied in such numbers and dispatched by such means as may be required by the *Employer.*

The *Contractor* makes available to the *Project Manager* as and when required, information necessary to enable the *Employer* to make and fit replacement parts.

2.2.2 Documentation Requirements

2.2.2.1 General

The *Contractor* complies with the requirements of VGB-R 171e "Guideline for the supply of technical documentation for fossil-fired and regenerative power stations" including Appendices A-G, which forms part of these requirements, and the *Contractor* is deemed to be familiar with this document to understand the *Employer's* requirements.

The *Contractor* complies with the requirements of IEC 61355 for the Classification of documents.
The *Contractor* complies with the requirements of IEC 62079 for the preparation of technical instructions for the operation, maintenance and servicing of the *works*.
Documentation is developed according to DIN 6779-10: Structuring principles for technical products and technical product documentation - Part 10: Power plants.
These are the minimum requirements to be met.

Areas where details are not specified they are proposed by the *Contractor* and subject to the *Project Manager's* acceptance.

2.2.2.2 Documentation Management

The documentation requirements cover the various engineering stages, from the retrofit design stage through fabrication, installation, testing and commissioning

The *Contractor* is responsible for the compilation and the supply of the documentation for all systems during the various project stages in accordance with the VDSS. VDSS documentation and drawings are programmed in the project schedule for delivery to align with the Key Dates.

The *Contractor* implements a document management system in compliance with ISO 9001:2015: Quality Management System-Requirements. In addition to ISO 9001:2015 the *Contractor* takes note of the *Employer's* Document and Record Management Procedure (240-53114186, Rev 1), compliance to this procedure it is mandatory.

The *Contractor's* document management system is implemented to ensure that:

- Correct document's metadata is captured.
- All documents can be traced and be accounted for.
- The documents are uniquely identified and their consistency with the physical configuration and design requirements maintained.
- The changes and modifications of the plant configuration conform to the documentation.
- Documents are periodically reviewed to confirm their continued suitability.
- The latest approved or appropriate, revisions of documents are used.
- Documents are properly stored to ensure easy accessibility and retrievability.

2.2.3 Formatting Requirements

a) Contract Documents

The *Contractor's* documents comply with the requirements of Technical Document and Record Management Work Instruction (240-76992014).

In order to portray a consistent image it is important that all documents developed for the project follow the same standards of layout, style and formatting.

- Layout and Typography

Every document complies with the following font specifications as per the Electronic Corporate Identity Manual on Eskom Intranet:

- Colour Specification: Black
- Main Headings Font Type: Arial, Bold, Capital Letters
- Main Heading Font Size: 12pt
- Sub Headings Font Type: Arial, Bold, Title Case
- Sub Headings Font Size: 11pt
- Body Font Type: Arial, Sentence Case i.e., only the first letter of the first word is a capital letter.
- Body Text Font size: 11pt
- Line Spacing: 1.5 line spacing
- Margins: standard (about 1 inch)
- Alignment: full justification to be used.
- Paragraphing: one line skip between paragraphs
- Pagination: centred page numbers (about 0.5 inches from bottom)
- Indentations: standard tab for all paragraphs (about 0.4 to 0.5 inches)

b) Data

The *Contractor* supplies the descriptive data including but not limited to equipment list, bill of quantities, and speciality item lists in MSExcel compatible to the *Employer*'s latest version. Compliance to this requirement does not constitute compensation event. The aforementioned lists contain the following fields for each item as a minimum:

- functional location
- tag ID (consistent with customer specifications)
- description
- associated drawing and document names (that contain references to this item)

c) Drawings

The creation, issuing and control of Engineering Drawings is in accordance with the latest revision of engineering drawing Standard – Common Requirement (240-86973501).
The *Contractor* submits as minimum of one hardcopy and an electronic copy to the *Project Manager*

The *Contractor* submits editable electronic drawings in MicroStation (DGN) format, and scanned drawings in PDF format. Drawings issued to the *Project Manager* must not be "Right

Protected" or encrypted as the *Employer* has to do the necessary configuration management on these documents upon receipt.

Electronic drawings must have a water mark indicating the approval phase of a drawing and hardcopies must be stamped to indicate the phase.

Any drawing requested by the *Project Manager,* which forms part of the *works*, does not constitute a compensation event.

d) Documentation Submission and Recording

The *Employer* provides a list of documentation to be submitted by the *Contractor*. The *Contractor* can only add to the list after agreement from the *Employer* is obtained.

Based on the list referred above, the *Contractor* develops a documentation deliverable schedule that is in line with the Key Dates.

The *Contractor* submits to the *Project Manager* a documentation deliverable Schedule for acceptance within one month of Contract Date. As a minimum, the Documentation deliverable schedule includes list of drawings and must have the following information:

a) Date of submission

b) Document description

c) Document Type

d) Revision number

e) Document Status

The schedule is updated and submitted to the *Project Manager* for review and acceptance as and when changes are effected.

After being informed of the decision to accept or reject the schedule, the *Contractor* revises and submits the updated schedule within 48hrs after being informed of the *Project Manager's* decision.

2.2.3.1 Minimum Requirements

The *Contractor* delivers all data, drawings, and documents generated in the *Contractor's* designed system of choice to the *Project Manager* in the following public domain formats:

a) Data:

The *Contractor* supplies the descriptive data such as equipment list, switchgear schedules, price schedules, speciality item lists and the like in Excel (MS Office 2003 or later compatible format) spreadsheets. All lists will contain the following fields for each item in the lists as a minimum, functional location/tag ID (consistent with customer specifications), description, associated drawing and document names (that contain references to this item) and a minimum of 10 additional fields of data as directed by the *Project Manager.*

b) Drawings:
Drawings are delivered by the *Contractor* in digital format in either DGN (version eight or later) or DWG (version 2004 or later). These drawings contain sufficient graphical detail and engineering intelligence, and are of proper configuration to allow the lists specified in the data deliverables to be digitally extracted. In addition, drawing lists are delivered in Excel format that contains the following fields: drawing named, drawing type (consistent with customers checked by and up to five additional fields as per customer request.

c) Documents:
The *Contractor* delivers documents in electronic format (MS Office 2003 compatible or Adobe Acrobat pdf files). In addition a document list is delivered by the *Contractor* in Excel format that contains the following fields: Document name, Document type, Version number, Date created, Created by.

2.2.3.2 Digital Plant Data Drawings

Plant data and drawings in electronic (digital) format are supplied by the *Contractor* in the XMpLant format (an advanced XML based exchange format based on ISO 15926).

The *Contractor* delivers all data, drawings, and documents generated in the *Contractor's* 3-D design system of choice to the *Project Manager* in the public domain format XMpLant. This deliverable contains sufficient graphical detail and engineering intelligence, are of proper configuration to be imported into the *Employer's* target PDS, retaining the full fidelity and intelligence found in the *Contractor's* design system.

2.2.4 Drawings Standard

The *Contractor* ensures that submitted drawings comply with the requirements of Engineering Drawing Standard – Common Requirement (240-86973501).

Drawing practice, formats, title blocks, and numbering conforms to the standards applicable for the Project, and are to be agreed between the *Contractor* and the *Project Manager* during a kick-off meeting. Proposals are submitted to the *Project Manager* for review and acceptance.

2.2.5 Configuration Management

The *Contractor* employs a comprehensive configuration management program according to ISO 10007 (2nd Edition) to ensure that plant structures, components and computer software conform to approved design requirements.

As a minimum, the configuration management program shall include:

a) Plant Coding
b) Plant labelling

In addition, the AS BUILT physical and functional characteristics of the works are accurately reflected in selected documents and databases, including those for design, procurement, construction, and operation, testing and training.

The *works* “AS BUILT” physical and functional characteristics are accurately reflected in the submitted documents and databases (i.e. engineering, design, procurement, construction, operation, testing and training) in alignment with the requirements of the configuration management.

The configuration management is applicable for use throughout all phases of the project life cycle, including management of spare parts, replacement parts and product upgrades, and form part of deliverables for hand-over to the *Project Manager* for the *Employer* to use during the operation and maintenance phases of the plant.

The *Contractor* submits to the *Project Manager* any design deviations together with justifications, including assurance by means design analyses demonstrating compliance to *Employer’s* requirements. Deviations are reviewed for Acceptance by the *Project Manager.*

2.2.5.1 Plant Coding

Coding of all Plant and Materials and documentation supplied is part of the *works* and is the responsibility of the *Contractor*. The *Contractor* is fully familiar with the standards and concepts of the coding system as applied by the *Employer*.

The *Contractor* is also responsible for the coding of all the *works* as set out in this document as well as equipment and components in his supply for which he is responsible in terms of engineering and design. The *Employer* issues a list of codes to be used and the *Contractor* provides a list of where the codes are used, in accordance with the *Employer*'s standard documentation.

The allocation of all codes is accepted by the *Project Manager*. The *Contractor* ensures that the code is applied in a uniform and consistent way and that all codes allocated are unique.

The *Contractor* provides the *Project Manager* with the following:

a) Outline drawings or diagrams showing the *Contractor*'s reference coding for systems and equipment.

b) In respect of items procured by the *Contractor* from another manufacturer or vendor, the *Contractor* provides the name of the actual manufacturer and his coded drawing or reference numbers and relevant technical data for identification purposes.

Kendal Power station AKZ Coding Manual will be used for plant coding. The AKZ plant codes generated by the *Contractor* are submitted to the *Project Manager* for acceptance. AKZ coding shall be applied from the design stage and cross referenced accordingly as a unique identification means to all documentation such as arrangement drawings, schematics, wiring diagrams, instructions and manuals and where practical to spare parts lists/manuals. References to plant are accompanied by the relevant AKZ code for that item of the plant.

The component identification numbers are not to be confused with equipment names or their abbreviations. Official equipment names and nomenclature for use on drawings are based on the computerized listing of equipment names developed during the initial stage of detailed design.

Each component or item separately identified for any project purpose is given a unique identification number that is uniformly used in all applicable documents.

The component identification number is used in computer lists that define other information, such as engineering data.

2.2.5.2 Plant Labelling

It is the responsibility of the *Contractor* to manufacture and install labels. Labels are manufactured and installed according to the Kendal Power station AKZ Plant Labelling Guideline (240-62937990, Rev 1).

Labelling includes the relevant AKZ code with English descriptions. The *Contractor* submits a Label Schedule/List spread sheet to the *Project Manager* for verification and acceptance, 60 days before commencement of manufacturing. The Label schedule includes the label information such as the AKZ code, full label description, positioning and designation.

Abbreviations to descriptions on the labels are generally not acceptable. Where abbreviations are unavoidable, due to the limited number of characters that can be engraved/etched on labels, the abbreviations are submitted to the *Project Manager* for acceptance.

2.2.6 Documentation Submission and Recording

The *Contractor* establishes a document tracking system to record the dates for the supply and receipt of all design drawings, calculations and requests for information.

The *Contractor* submits to the *Project Manager* a document deliverable schedule within one month of the *starting date* of all documents for acceptance. This schedule provides individual titles of drawings and calculations, and their proposed submittal dates, for submittals as requested in the Works Information and as necessary for the review by the *Project Manager* of the proposed means of compliance by the *Contractor* with all aspects of the requirements of the contract. The scheduled date of first submittal, time allowed for acceptance and expected date of issue after acceptance will be shown for each drawing.

The *Employer* provides the VDSSs with the enquiry documentation. The *Contractor* reviews the applicable VDSS in line with the programme for *Project Managers*' acceptance. A proposal of all document types is supplied by the *Contractor* in accordance with these requirements together with a preliminary VDSSs. Documentation and drawings are programmed for delivery to meet the Key Dates in accordance with the agreed VDSSs

The *Contractor* shall comply with the requirement of Kendal power station documentation deliverable requirements specification which are to be obtained from the Project manager.
All correspondences are recorded in a formal letter with the letter head and must have correspondence number. Both Parties are to keep register of all correspondence

2.3 Health and safety risk management

In addition to the requirements of the laws governing health and safety, Eskom may have some additional requirements particular to the *works* and the Working Areas for this contract. The text below provides for these being attached as an Annexure to this Works Information. PLEASE ALSO READ CORE CLAUSE 27.4 TOGETHER WITH Z7 IN THE ADDITIONAL CONDITIONS OF CONTRACT TO MAKE SURE THAT WHATHEVER IS INCLUDED IN THE ANNEXURE FOLLOWS ON FROM THOSE CLAUSES.

The Divisional/Regional Safety Risk Manager or his representative having jurisdiction over the *works* must provide the relevant safety, health and environmental (SHE) criteria for incorporation into this Works Information. The SHE specification / scope must be signed off by the Divisional/Regional Safety Risk Manager or his representative confirming that the applicable safety criteria have been taken into account.

The Commodity Manager / Buyer must refer the tender to the Divisional/Regional Safety Risk Manager or his representative in order to evaluate against enquiry-specific safety criteria.

The Divisional Safety Risk Managers who will be responsible for the allocation of resources to assist P&SCM with the above processes are as follows:

- Generation: Roley McIntyre
- Transmission: Tony Patterson
- Distribution: Alex Stramrood
- Enterprises: Jace Naidoo
- Corporate: Kerseri Pather

The *Contractor* shall comply with the health and safety requirements contained in Annexure _____ to this Works Information.

2.4 Environmental constraints and management

The *contractor* is responsible for keeping the working area clean of any environmental waste.
All waste introduced and/or produced on the *Employers'* premises by the *contractor* for this contract, is handled in accordance with the minimum requirements for the handling and disposal of Hazardous waste in terms of Government Legislation as proclaimed by the of Water Affairs and Forestry and *Employers'* environmental requirements.

The *Contractor* shall comply with the environmental criteria and constraints stated in Annexure _____

2.5 Quality assurance requirements

Specify minimum requirements for the *Contractor*'s Quality Plan and Work Procedures or provide the *Employer*'s Quality Plan if that is to be used. Make sure witness and hold points are identified generally and describe any particular requirements for QA outside the *working areas*. Indicate how the *Contractor*'s QA documentation is to be submitted for acceptance and any conditions that need to be imposed relating to acceptance. State whether ISO compliance is a condition and if so which ISO standard shall apply.

2.6 Programming constraints

The *contractor* complies with the *Employer's* quality and technical requirements.

The *contractor* submits a QMS as a returnable schedule and uses it for all phases, the QMS complies with the requirements of all ISO standards

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

The *contractor* submits a single programme that incorporates the programmes of all his Subcontractors
The interface points between his different *Subcontractors* as well as the interface points between the individual *Subcontractors* and the *Contractor* are to be clearly identified

2.8 Invoicing and payment

The Z clauses make reference to invoicing procedures stated here in this Service Information. Also include a list of information which is to be shown on an invoice.

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;
- (add other as required)

Add procedures for invoice submission and payment (e. g. electronic payment instructions)

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.

2.10 Contract change management

The Contract management changes notes depicted below are at all times subjected to NEC3 ECC core clauses 16 and 60 and all clauses referring to the changes of the contract. These clauses supersede the notes below:

a) Changes to this contract do not automatically grant the Contractor legitimate right to compensation events, claims or proceedings.
b) Either party may request a contract change provided that such changes are formally communicated prior to implementation
c) The *Project* manager assesses and documents the potential impact of a proposed contract change before presenting it to the Compensation Event Committee.
d) The *Project Manager* has the right to request the *Contractor* to make reasonable amendment to a contract change request
e) The *Project Manager* has the right to reject a change and specify his reasons
f) No proposed contract change will be implemented by the *Contractor* without prior approval of the *Project Manager*

g) Unless The *Project Manager* expressly agrees otherwise in writing the *Contractor* continues to provide the works in accordance with the Works Information and this contract as if the proposed contract change does not apply
h) Any discussions, negotiations or other communications which may take place between the *Project Manager* and the *Contractor* in connection with any proposed contract change, including submission of any change communications is without prejudice to the employer other rights under this contract

Each party bears its own costs in relation to preparation and agreement of each change request and impact assessment.

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*

If Option C, D, E or F applies first read clause 52.2 and then state whether the *Contractor* is required to keep any <u>other</u> records. Include any other constraint which may be required in regard to format and filing of the records, and whether access for the *Project Manager* shall be provided in hard copy or electronically.

Could delete if Options A & B apply unless the *Employer* requires some form of control over the *Contractor*'s record keeping.

2.13 Training workshops and technology transfer

Describe type and frequency of on job training workshops, as well as any obligation for technology transfer being included as part of the contract on Completion of the *works*.

3 Engineering and the *Contractor*'s design

The content of this section will depend on whether the contract is for construction only with most of the design done by (or for) the *Employer* or whether it is a 'design and construct' contract. ECC provides for design by either Party in any proportion, which proportion done by the *Contractor* must be stated in this part of the Works Information.

3.1 *Employer*'s design

The *Employer* provides the following documentation/drawings for this w*orks*:

a) Cross-over plant Layout Drawings

b) Relevant Eskom Standard Specifications

c) Existing High Mast Information

All *Employer* information and property made available to the *Contractor*, including the *work* done by the *Contractor* for the *Employer*, is confidential and may not be disclosed to anyone unless authorised by the *Project Manager*

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

The *Contractor* is responsible for the following as a minimum:

a) Decommissioning and removal of all piping and valves.

b) Supply, installation and function testing of valves and pumps

c) Civil structure repairs

d) Pumps supply and performance testing.

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

This is a mandatory requirement of core clause 21.2 and must be addressed. Identify the extent of detail (the particulars) of the *Contractor*'s design which is to be submitted to the *Project Manager* for his acceptance. This procedure may also include a design stage activity matrix or requirements for co-operation with Others on a multi party project. State requirements for drawings to be prepared by the *Contractor*.

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.

3.5 Use of *Contractor*'s design

First read core clause 22.1 and then include here the exceptions and other purposes if applicable. If there are none this section could be deleted leaving the core clause to stand.

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

There is a cross reference from the definition of Disallowed Cost in Options C D and E to the Works Information regarding procurement procedures. This part of the Works Information MUST include any such procedures to be able to administer this procedure. Options A & B may also require constraints on procurement procedures.

4.1 People

4.1.1 Minimum requirements of people employed on the Site

Before starting work on a task the Contractor shall provide to the Service Manager for their acceptance outline details of persons to be employed for work in the task, to the extent that the service Manger has requested in the Task order

The contactor shall not commence work in a task order until such persons to be employed have been accepted by the service Manager. The Service Manager may not accept person who are in their option not adequately qualified or experienced to undertake the work in the task

The contractor shall provide for the service manager's acceptance similar details for new or replacement person employed after work in the task order has commenced.

4.1.2 BBBEE and preferencing scheme

Specify constraints which *Contractor* must comply with after contract award in regard to any Broad Based Black Economic Empowerment (B-BBEE) or preferencing scheme measures.

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

If the ASGI-SA requirements are to be included in this contract specify constraints which *Contractor* must comply with after contract award in regard to any ASGI-SA requirements. The ASGI-SA Compliance Schedule completed in the returnable tender schedules is reproduced here. If ASGI-SA does not apply, delete this paragraph.

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.

4.2 Subcontracting

4.2.1 Preferred subcontractors

ECC does not make use of nominated subcontracting, but the *Employer* may list which subcontractors or suppliers the *Contractor* is required to enter into subcontracts with. This is usually only required where Plant

and Materials need to be obtained from a particular supplier or group of suppliers in order to comply with operational standards.

4.2.2 Subcontract documentation, and assessment of subcontract tenders

Specify any constraints on how the *Contractor* is to prepare subcontract documentation, whether use of the NEC system is compulsory or not (compulsory is recommended) and how subcontract tenders are to be issued, received, assessed (using a joint report?) and awarded.

4.2.3 Limitations on subcontracting

The *Employer* may require that the *Contractor* must subcontract certain specialised work, or that the *Contractor* shall not subcontract more than a specified proportion of the whole of the contract.

4.2.4 Attendance on subcontractors

State requirements for attendance on Subcontractors, if any

4.3 Plant and Materials

4.3.1 Quality

a) The *Contractor* submits a fully detailed Quality Control Plan (QCP) for acceptance within one week of the Contract Date.

b) The *Contractor* submits a schedule of unpriced orders to be placed and this is updated regularly.

c) 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). This level is based on the criticality of plant and materials, and is submitted to the *Employer* for acceptance.

d) Product data sheets and product samples are submitted for review and acceptance by the *Project Manager* after contract award and prior to the commencement of work.

e) The *Contractor* submits on a monthly basis, the following QA returns:

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

f) All quality control documentation is submitted to the *Project Manager* within 7 days of Contract Date.

4.3.2 Plant & Materials provided "free issue" by the *Employer*

State arrangements for collection by *Contractor* or delivery by others on behalf of the *Employer*, off loading, inspection, storage, care custody and control, return of unused Plant and Materials, etc. State whether any samples are to be provided by the *Employer* and if so how, where and when. Always include a statement to the effect that 'all other Plant and Materials are to be provided by the *Contractor*'.

4.3.3 *Contractor*'s procurement of Plant and Materials

Specify any constraints on how the *Contractor* is to order, codify, expedite, freight, import, transport to Site and any other requirements for delivery and storage before installation. The *Employer* may require warranties from suppliers to be in favour of the *Employer* and not just to the *Contractor* during the life of the contract. Also include requirements for vendor data which the *Employer* may need after Completion of the whole of the *works*. THIS IS A VERY IMPORTANT SECTION IN PROCESS PLANT AND UTILITY PROCUREMENT CONTRACTS.

4.3.4 Spares and consumables

Some contracts may need to include provision for the supply of a minimum category of spares, fuel, oil or other feed stock and consumables which the *Employer* may need at or just after take over and that it is best the *Contractor* provide these initially as part of his Providing the Works.

4.4 Tests and inspections before delivery

Contractor must ensure all the plant components pass all the Factory Acceptance Tests (FAT) and the all the QCP hold points are witnessed by the Eskom engineer. The following tests and inspections must be done before delivery.

1) Welding NDT's , Dye pent and Radiographic test
2) Pump performance tests and hydro tests

4.5 Marking Plant and Materials outside the Working Areas

Core clauses 70.1 and 71.1 require the Works Information to state how the *Contractor* is to "mark" Plant and Materials which is outside the Working Areas if they are to be paid for before delivery to the Working Areas. Specify here how the *Contractor* is to mark the Plant and Materials.

4.6 *Contractor*'s Equipment (including temporary works).

In contracts which require the *Contractor* to procure sophisticated or highly specialised Equipment that could have a major influence on the progress of the works, the *Employer* may wish to exercise constraints or

include witness and hold points during manufacture, assembly or delivery of such Equipment. Include these constraints here taking care not to imply that the *Employer* or the *Project Manager* take on any liability as a result. See also section 3.6 above relating to the design phase of the *Contractor*'s Equipment.

4.7 Cataloguing requirements by the *Contractor*

State whether cataloguing is applicable, if it is, reference the requirements for cataloguing that need to be satisfied by the *Contractor* (consult Procurement Instruction Number 1 of 2018 – Incorporating Cataloguing into the Procurement Environment, Unique Identifier 240-1289988974).

5 Construction

This part of the Works Information addresses constraints, facilities, services and rules applicable to the *Contractor* whilst he is doing work on the Site during the construction and maintenance phase. It does not specify the work itself as that is included in Section 6 of the Works Information.

For contracts involving civil works the approach may be to incorporate SANS1200A or SANS 2000 into the contract. Whilst many of the headings below address the same issues, the list of headings below is more comprehensive. If the headings below are used, it may be prudent to delete paragraphs 3, 4 and 5 from 1200A after checking that their requirements have been included below as necessary. A similar approach can be used in contracts involving building works where the Model Trade Preambles are incorporated. Care should be taken to avoid inconsistency or ambiguity between this part of the Works Information and standard specifications incorporated by reference.

5.1 Temporary works, Site services & construction constraints

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

Kendal power Station is a proclaimed national key point. The contractor therefore complies with:

- All Eskom Kendal security rules
- All requirements associated with obtaining permit and authorisation before entering site.

All ESKOM lifesaving rules and site regulations to be obtained from the *Employe*r

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

Access to site controlled and governed by the terms and conditions laid down by the power station. The site is shown the contractor during the site meeting or clarification meeting.

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

The *contractor* and his employees must take cognisance of all site restrictions, working hours and conduct on site.

The *Contractor* shall keep records of his people on site as per workers register including those of his subcontractors which the Project manager or supervisor has access to any time. These records may be required by the *Employer* at any given time for the following not limited to

5.1.4 Health and safety facilities on Site

Section 2.3 deals with contractual H & S requirements in addition to those of the OHSA Act. This section allows the *Employer* to state what measures are to be taken on Site against disease and epidemics and in emergencies. Also describe where First Aid facilities provided by the *Employer* are located and any other emergency arrangements. Do not use if already addressed in 2.3. The cross reference from Clause 27.4 applies.

5.1.5 Environmental controls, fauna & flora, dealing with objects of historical interest

This sub-paragraph may not be required if these matters are dealt with in the general environmental requirements referred to in paragraph 2.4 above.

5.1.6 Title to materials from demolition and excavation

The *Employer* shall inform the Contractor on where to take the scrap and rubbles to.

The contractor shall keep records and register all equipment's belonging to that the contractor when entering and leaving site.

5.1.7 Cooperating with and obtaining acceptance of Others

This sub-paragraph could be used to deal with two issues.
1) The cross reference from core clause 25.1 about cooperation generally as well as details about Others with whom the *Contractor* may be required to share the working areas. See clause 11.2(10) for the definition of Others.
2) Requirements for liaison with and acceptance from statutory authorities or land owners.

5.1.8 Publicity and progress photographs

The taking of photographs in the power station including the project works is restricted subject to approval by the Project manager.

5.1.9 *Contractor*'s Equipment

The *contractor* shall provide with any other equipment that will be required to carry the works.

5.1.10 Equipment provided by the *Employer*

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

5.1.11 Site services and facilities

The *Employer* shall provide electricity.
The *Employer* shall provide water.
The *Employer* shall provide absolute.

5.1.12 Facilities provided by the *Contractor*

The *contractor* shall provide storage for his office equipment's and tools, telephones, offices .
The *contractor* shall de-mobilize upon completion of the contract

5.1.13 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.

5.1.14 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*.

5.1.15 Excavations and associated water control

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

5.1.16 Underground services, other existing services, cable and pipe trenches and covers

The Contractor will need to locate existing under and above services on site.
Upon establishing these services, the Contractor must engage with Project Manager for further action

5.1.17 Control of noise, dust, water and waste

Control of waste shall be as per environmental waste management procedure.
The Employer shall inform the Contractor on where to take the scrap and rubbles to

5.1.18 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.

5.1.19 Giving notice of work to be covered up

State the procedure for notifying the *Supervisor*

5.1.20 Hook ups to existing works

Water and power supply shall be hooked from the existing works

5.2 Completion, testing, commissioning and correction of Defects

5.2.1 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	Within days after Completion
	Performance testing of the *works* in use as specified in paragraph of this Works Information.	See performance testing requirements.

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

The Employer doesn't intend using or taking over the works until completion has been certified by the *Project Manager*

5.2.3 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.

5.2.4 Commissioning

The *Contractor* issues a detailed commissioning program for acceptance

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

Upon completion of the works /part thereof the *employer* shall start-up the plant in order to test the plant and determine successful implementation of the works. The *contractor* shall be in attendance whilst he does it. All abnormalities and defects encountered during this plant check are to be brought to attention of the *contractor*

5.2.6 Take over procedures

The Project Manager certifies Completion for each section of the works and the whole of the works when the criteria for each section of the works and the whole of the works have been met in full

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

The *Project manager arranges for the Employer* to allow the *Contractor* access to and use of part of the works which he has taken over if they needed for correcting a defect.
In this case the defect correction
Period begins when the necessary access and use have been provided. Any material required for the correction of defects must be provided by *Contractor*.

5.2.8 Performance tests after Completion

The Contractor will be required to demonstrate that the works can operate as guaranteed by the Contractor.

5.2.9 Training and technology transfer

Include if the *Employer* requires the *Contractor* to provide training in the use and maintenance of the *works* or any associated transfer of technology from him to the *Employer*.

5.2.10 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

6 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.

6.1 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.

6.2 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

6.3 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.

6.4 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.

6.5 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.

6.6 Other [as required]

7 List of drawings

7.1 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~~

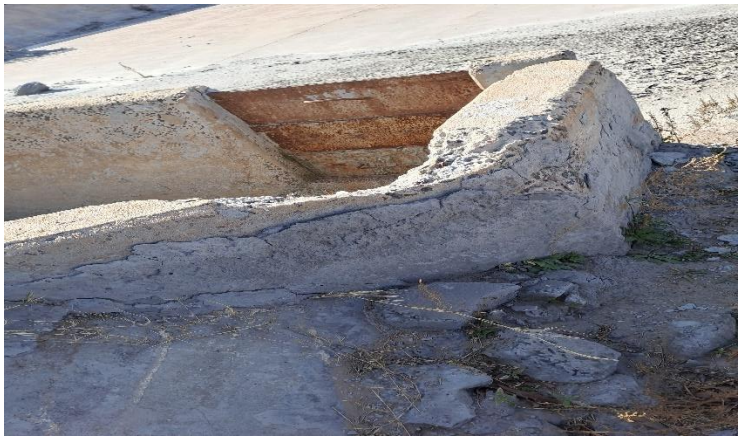
Drawing number	Revision	Title
0.64/ 33717	**Revision 2**	**Ash thickener tank details**
0.64/ 34006	**Revision 1**	**Thickener underflow G.A of sludge piping**
0.64/36673	**Revision0**	**Thickener with skimmer arrangement**

C3.2 *CONTRACTOR*'S WORKS INFORMATION

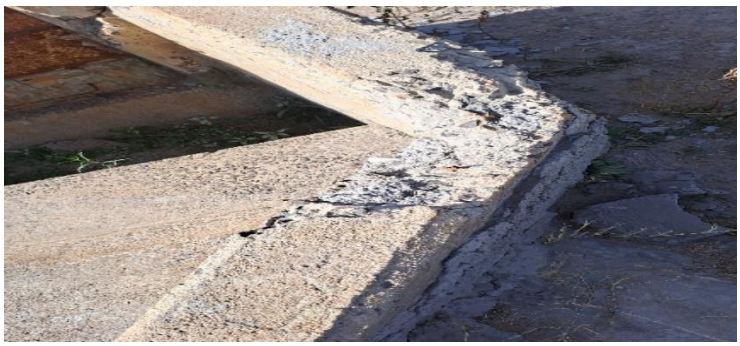
The contractor shall be responsible to execute the following scope of work on order to assure availability and reliability of the crossover plant

7.2 Sludge drying bed

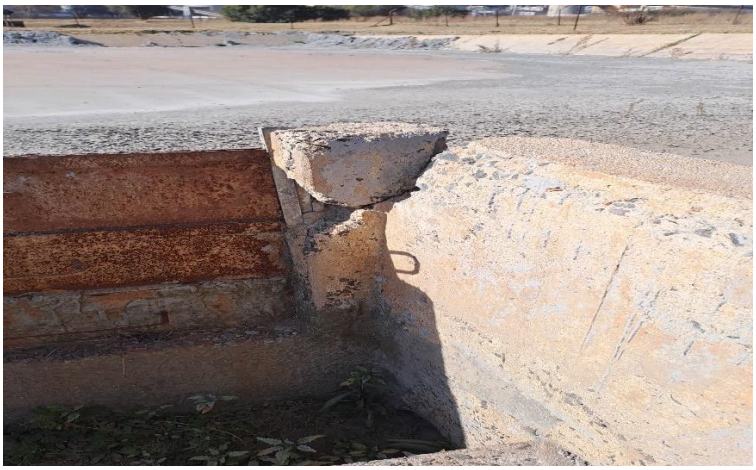
- Cleaning and removal of ash on both sludge drying bed 1 and 2 – 50m X 30m X 1m (sludge bed dimensions)
- Repair damaged concrete wall of both sludge drying bed 1 and 2



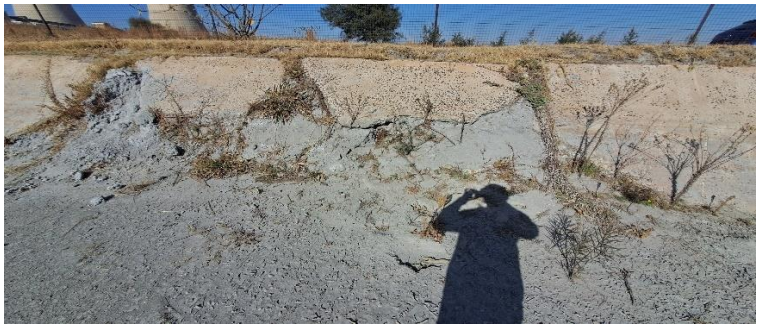
➢ Surface concrete repairs (0.2 m X 0.3 m X 0.3 m) along with rebars



➢ Surface concrete repairs (0.2 m X 0.3 m X 0.3 m) along with rebars



- Repair of the 0.5 m X 0.3 m X 0.3 m along with the rebars



- Replacement of 6m X 1.5 m X 0.6 m wall, including rebars

- Refurbishment of isolation gates – 4 off 400mm X 200 mm stainless steel with handles
- Replacement of all missing isolation gates – 12 off 400mm X 200 mm stainless steel with handles
- Installation of surf guards to prevent foreign objects from entering the sludge sump – 2 off rectangular guards with stainless steel frame and menlath sheet (700mm X 300mm X 400mm)
- Removal of hard ash on sludge drying bed dissipater flow diverter

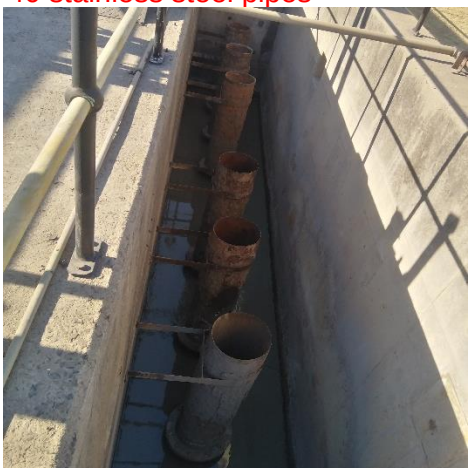
7.3 Sludge sump

- Complete removal of ash inside the sludge sump – Sludge sump dimensions (5m X 7m X 12m)

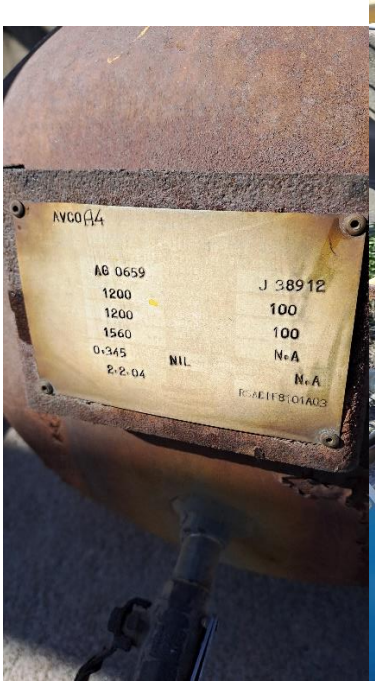
- Removal, strip, assess and service of sludge pump 2 (if the pump can't be repaired or serviced then a new pump must be purchased)
    - Hazleton submissible sludge pump
    - Model : 50L SSB
    - Serial No.: KDP 004
    - Head: 12 m
    - Flowrate : 5 l/s
- Purchase of new sludge pump 1
    - Hazleton submissible sludge pump
    - Model : 50L SSB
    - Serial No.: KDP 004
    - Head: 12 m
    - Flowrate : 5 l/s
- Installation of new pipe work and valves
    - 6m 100mm galvanized carbon steel pipe
    - 1 X 90^{o} bend
    - 100mm butterfly valve with a lever
- Installation of sludge pump 1 and 2
- Restore electrical power and C&I controls
- Installation of electrical panel roof for rain cover

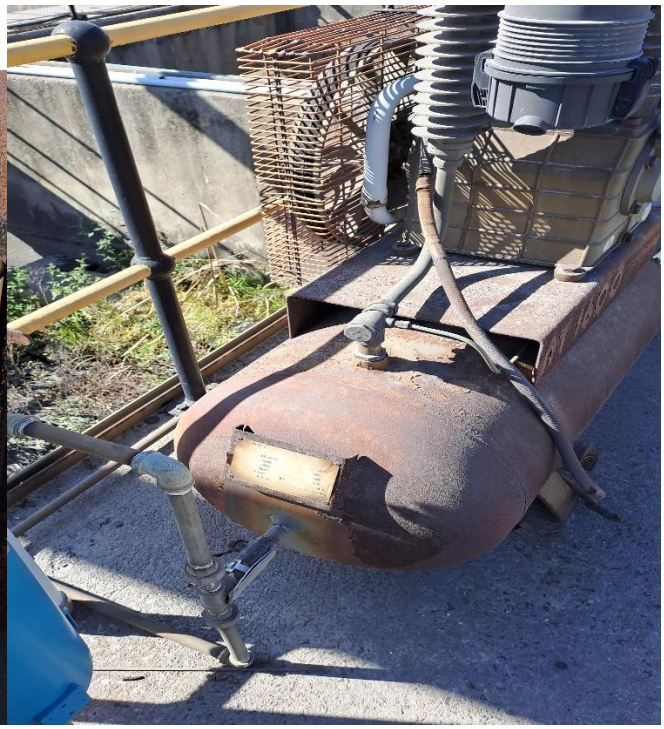
7.4 Clarifier oil separator plant

- Replacement of all 12 clarifier separator vertical pipes/tubes with stainless steel tubes – 12 of 3m 350mm Schedule 40 stainless steel pipes



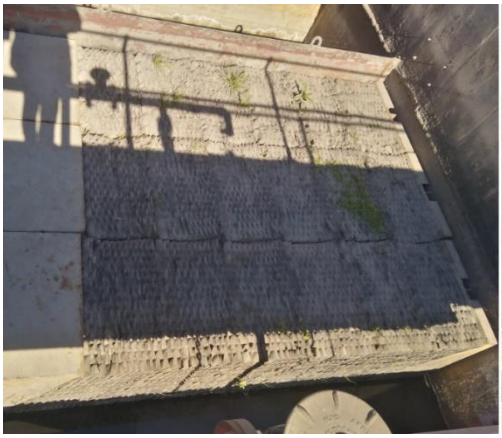
- Replacement of 2 all clarifier discharge valves - 50mm Saunders diaphragm valve
- Replacement of all 8 clarifier sludge sump pump supply isolation valves - 100mm Saunders diaphragm valve
- Servicing of both pneumatic pump system
  - ARO pneumatic pump
  - Model : 666150 – 322
  - Serial No.: 10043810
  - Max working pressure: 8 Bar
- Replacement of all filters
  - Ultraspil filter
  -
- Replacement of oil separation compressor system

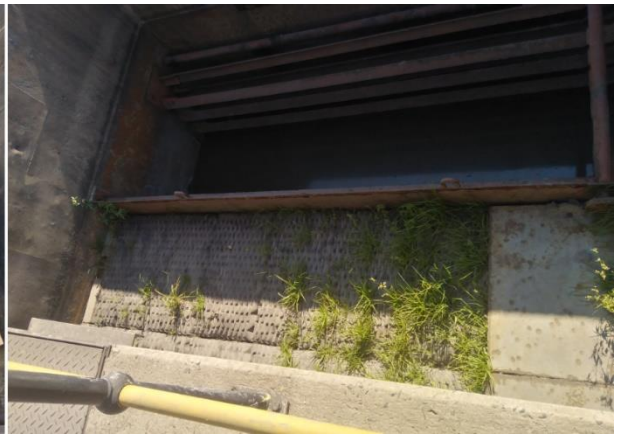




- Min pressure output = 1200 kPa
- Max pressure output = 1560 kPa

- Empty and clean oil catchment tank – 2m3 tank
- Replacement of all missing pipework on the oil catchment tank
  - 30m 50mm PVC pipe
  - 10 X 90º elbows
  - 50mm PVC ball valve
- Replacement of all plastic piping and fittings for oil separation system to stainless steel
  - 50mm 35m stainless steel pipe
  - 12 X 90º
- Clean and remove weeds on all 4 coalescence streams
- Draining and inspection of supported propylene plates installed at a 60' angle of inclination in rectangular packs. – number of plates? Polypropylene coalescers packs (see the picture below)





- Removal all 4 clarifier sludge pumps

  - Hazleton submissible sludge pump
  - Model : 50L SSB
  - Serial No.: KDP 004
  - Head: 12 m
  - Flowrate : 5 l/s

- Conduct detail technical assessment on the pumps and if found to be serviceable then service or refurbish all 4
- If the pumps are not repairable then purchase 5 new pumps including a spare
- Install all 4 sludge pumps
- Replace all rusty and defective pipe work
  - 102m 100mm galvanised carbon steel pipe
  - 12 X 90º
  - 2 X T-piece

  - 22m 50mm galvanized carbon steel pipe
  - 10 X 90º
- Replace all defective isolation gates
  - 4 off 600mm X 250mm stainless steel plates
- Installation of roof across the clarifier plant to prevent rain water from entering electrical panels – 40 X 40 m
- Restoration of electrical power and C&I controls and protections
- Assure all electrical systems and lighting are restored to good working condition

7.5 Thicker

- Installation of the gearbox
- Installation of filters
- Electrical connections
- Refurbishment of the Eimco Thickener Consisting of the following
    - An open reinforced concrete tank, full bridge truss structure, central rotating drive mechanism, submerged rotating rake arms, blades, central feed well baffle, central45" conical discharge outlet and cone scrappers.
- Bridge Truss structure refurbishment.
- Refurbishment of all submerged rotating arms, blades, baffles, outlets, and scrappers
- Commissioning the plant

7.6 Underground pumping system

- Cleaning and removal of underground water and debris
- Removal of both underground centrifugal pumps since the casings are rusted
    - 2 X Warman 4/3 C slurry pumps
- Removal of all rusted and defective piping
    - 6m 150mm galvanized carbon steel pipe
    - 3 X 150 mm 90º bends
    - 2 X 150mm to 80mm reducer
    - 1 X 150mm T-piece
    - 1 x 250mm to 150mm reducer
    - 8m 80mm galvanized carbon steel pipe
    - 2 X 80 mm 90º bends
    - 1 X 80mm T-piece
    - 90m 50mm galvanized carbon steel pipe
    - 14 X 50 mm 90º bends
    - 3 X 50mm T-piece
- Purchase of new centrifugal pumps and piping
    - 2 X Warman 4/3 C slurry pumps
- Installation of pipe work
    - 6m 150mm galvanized carbon steel pipe
    - 3 X 150 mm 90º bends

- 2 X 150mm to 80mm reducer
- 1 X 150mm T-piece
- 1 x 250mm to 150mm reducer
- 8m 80mm galvanized carbon steel pipe
- 2 X 80 mm 90º bends
- 1 X 80mm T-piece
- 90m 50mm galvanized carbon steel pipe
- 14 X 50 mm 90º bends
- 3 X 50mm T-piece

- Installation of new centrifugal pumps
  - 2 X Warman 4/3 C slurry pumps
- Installation of electric motors
  - 2 X 7.5 Kw Three phase induction motors
  - Valtage : 380V
  - Current : 14,4 A
  - RPM : 1450
  - Serial No.: 1001431406 (Delba Electrical Co)

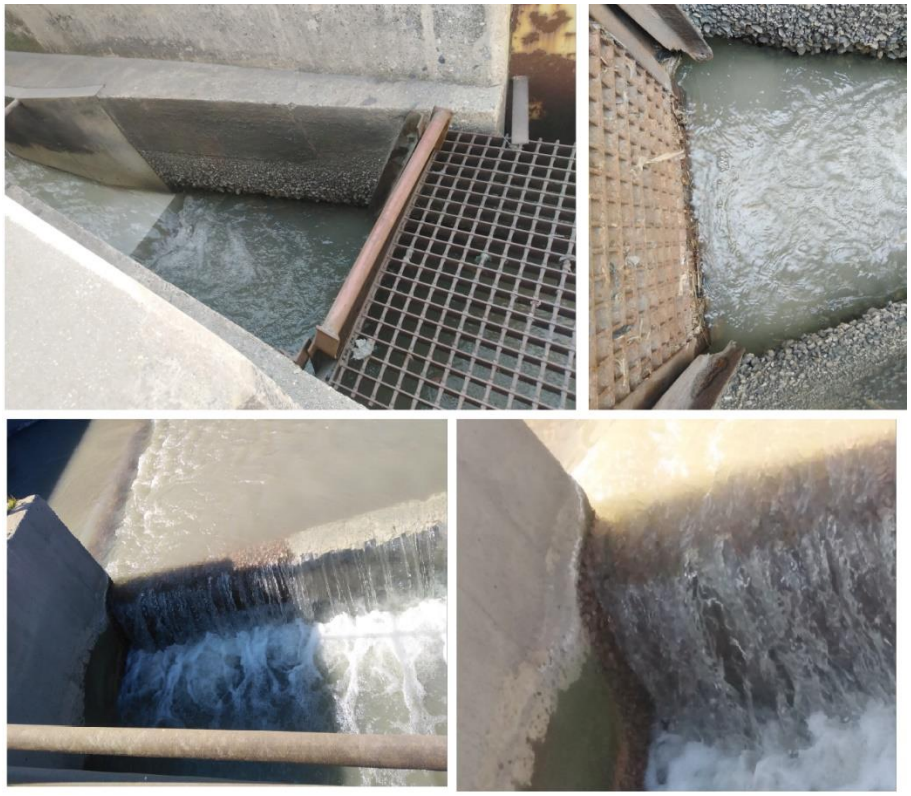
- Replacement of isolation valves
  - 2 X 100mm Saunders diaphragm valves
  - 2 X 80mm Saunders diaphragm valves

7.7 Clean and dirty water inlet

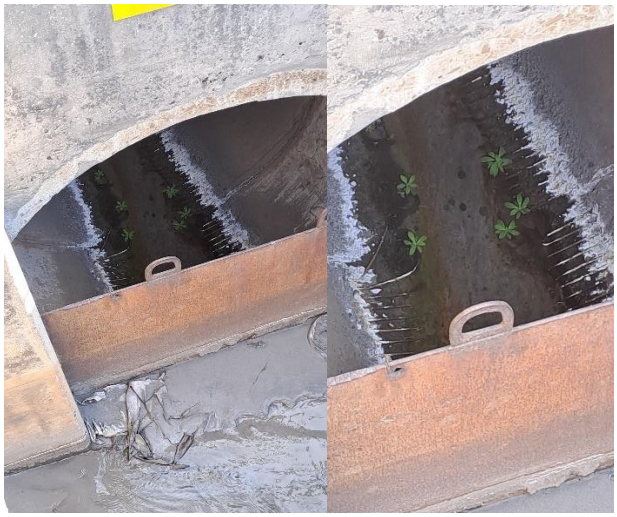
- Replacement of all defective sluice gates
  - 3 X 2 m stainless steel plate
  - 0.5 X 3 m stainless steel plate
  - 3 X 3 m stainless steel plate
  - 0.5 X 2 m stainless steel plate
- Replacement of all defective screens
  - 1 X 4 m grating
  - 3 X 6 m grating
  - 3 X 6 m grating

7.8 Civils

- Repair all damaged concrete walls



➢ Surface concrete repairs, estimated total area = 30m^2



➢ Surface concrete repairs, estimated total area = 15m^2 including rebars