



## Technical Specification

## Generation

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Technical Specification**

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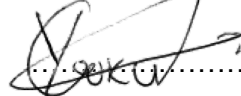
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## **1. INTRODUCTION**

The new build plant Kusile Power Station, currently under construction, is located in Mpumalanga approximately 10km north of the existing Kendal Power Station. Once constructed, the coal fired plant will consist of six units, each producing 800 Megawatts (MW) for a gross output of 4 800 MW to the National Grid.

Eskom's objective is to construct and commission the proposed 60 Year Ash Disposal Facility (60 Year ADF) so that it can accommodate ash that will be produced by the power station over its design life of 60 years.

As part of the 60 Year ADF a clean water cut-off channel needs to be constructed along the southern and eastern perimeter of the ADF. This Technical Specification covers the requirements for the construction of these *works*.

## **2. SUPPORTING CLAUSES**

### **2.1 SCOPE**

This document provides a description of the *works* required for the cut-off channel along the eastern and southern perimeter of the 60 Year ADF.

#### **2.1.1 Purpose**

The purpose of this document is to clearly define the scope of *works* with sufficient information to the successful tenderer (*Contractor*) in order to ensure that all requirements for this project are met.

#### **2.1.2 Applicability**

This document shall apply to Eskom Kusile Power Station.

### **2.2 NORMATIVE/INFORMATIVE REFERENCES**

Parties using this document shall apply the most recent edition of the documents listed in the following paragraphs.

#### **2.2.1 Normative**

- i. ISO 9001 Quality Management Systems.
- ii. OHS Act (Act 85 of 1993) as amended.
- iii. AB-Z-Z-AN-0001: Kusile User Requirement Specification, Rev 0.
- iv. 146838.23.0200: Kusile Project Design Manual.
- v. SANS 1200 Series: Standardised Specification for Civil Engineering Construction.
- vi. 240-93576498 KKS Coding Standard.
- vii. 22020-TO1-CE-RPT-001 : Design Report – Early Works Package.

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## 2.2.2 Informative

- i. 32-727 Safety, Health, Environment and Quality Policy/Procedure.
- ii. ENV13-R019 Water Management Policy.
- iii. 32-1163 Eskom Water Management Policy.
- iv. 32-245 Waste Management Standard.
- v. GGM 0970 – Guideline for The Integrated Water and Waste Management Process (specifically Zero Liquid Effluent Discharge, ZLED).
- vi. National Environmental Management Act (NEMA).
- vii. National Environmental Management: Waste Act (NEMWA, 2008 as amended).
- viii. NEMWA National Norms and Standards (GN R 634, 635, 636) (2013).
- ix. National Water Act, Act 36 of 1998.
- x. GN R 704: Regulations on Use of Water for Mining and Related Activities Aimed at the Protection of Water Resources.
- xi. NFPA 241 – Standard for Safeguarding Construction, Alteration, and Demolition Operations.
- xii. Series of best Practise Guidelines for Water Resource Protection in the South African Mining Industry.

## 2.3 DEFINITIONS

### 2.3.1 Disclosure Classification

**Controlled disclosure:** controlled disclosure to external parties (either enforced by law, or discretionary).

## 2.4 ABBREVIATIONS

**Table 1 : Abbreviations**

Abbreviation	Description
ADF	Ash Disposal Facility
BoQ	Bill of Quantities
ECC	Engineering and Construction Contract
GA	General Arrangement
ISO	International Standards Organisation
OHS	Occupational Health and Safety
QCP	Quality Control Plan
SANS	South African National Standards
ha	Hectare(s)
km	Kilometre(s)

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## 2.5 ROLES AND RESPONSIBILITIES

The *Contractor* is responsible for:

- i. Providing adequate resources including provision of equipment for required *works*.
- ii. Managing cost and a scheduled time frame of the *works*.
- iii. Ensuring the scope of *works* is carried out in full.
- iv. Providing regular feedback on the status of the *works*.
- v. Ensuring that all *works* are conducted by competent persons.
- vi. Ensuring that all *works* are carried out in accordance with OHS Act.
- vii. Ensuring that prior to any fieldwork, all parties working on Site have familiarized themselves with the *Employer's* safety requirements.
- viii. Ensuring conformance to all relevant legislation, whether natural, social, cultural or technical.

## 2.6 PROCESS FOR MONITORING

N/A

## 2.7 SCOPE OF CIVIL CONSTRUCTION FOR CLEAN WATER CUT-OFF CHANNEL

The scope of *works* to be undertake by the *Contractor* includes the following:

- i. The *Contractor* provides all manpower and labour, administration, transportation, tools plant, equipment, materials, fuels, other consumables and the like that are required to complete the *works* as specified herein and as shown on the drawings listed under Section 5.1 below.
- ii. The *Contractor* provides and maintains access to the designated construction camp, as shown in Part C.4 : Site Information, and temporary access to all parts of the Site. The extent of any temporary roads shall be limited to minimize disturbance of adjoining agricultural and fallow lands, preferably following existing farm tracks.
- iii. The *Contractor* is fully responsible for establishing all construction utilities, facilities and services that will be required by the *Contractor* for the duration of the *works*, including offices, sheds, ablutions, workshops, yards, security and all services at the designated camp site area. This includes all fencing and security measures. No facilities will be required for the *Employer* or *Project Manager*.
- iv. Topsoil shall be removed to a depth of 150 mm along the full length and footprint of the proposed cut-off channel and placed in a temporary windrow, for later re-use.
- v. Excavation and rough shaping of unlined channel by excavation plant.
- vi. Following completion of excavations, the banks and base of the cut-off channel shall be trimmed by hand to the lines and levels as shown on the drawings and within the tolerances as described in these specifications. This shall include removal of oversized boulders and any other unsuitable materials where so directed by the *Employer*. The base and banks of the channel shall be compacted using hand-held equipment, e.g. plate compactors. Batter boards shall be used to designate the final shape and alignment of the channel.

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- vii. Upon completion of trimming of the channel as outlined above, the previously conserved topsoil shall be evenly spread along the base and embankments of the channel and the area shall be treated with hydroseeding as detailed in these specifications.
- viii. Pre-cast concrete box culverts shall be installed at the locations and in accordance with the details as shown on the drawings, to provide access across the channel.
- ix. Gabion baskets and reno mattresses shall be placed at selected locations along the channel, as shown on the drawings or as directed by the *Employer*.
- x. Materials excavated from the channel shall be carted and placed at the designated spoil site. Prior to placement of excavated materials, the topsoil within the full extent of the spoil site shall be removed and stockpiled, for later re-use.
- xi. The height of stockpiled materials placed at the spoil site shall not exceed 3.0 m. Once all materials have been taken to the spoil site, the stockpile shall be neatly shaped and trimmed with batters no steeper than 1 (V) : 2 (H). The conserved topsoil shall be evenly spread over the stockpile area, which shall also be hydroseeded as detailed in these specifications.
- xii. The *Contractor* shall confine the movement of all vehicles, plant and equipment to designated routes within the site. No activity may take place within the 1:100 year flood line or the delineated riparian habitat, whichever is greater, or within a 500 m radius from the boundary of any wetland, unless specifically authorized by the water use licence.
- xiii. The *Contractor* shall take note of and ensure that the following designated heritage sites are not disturbed as a result of any construction activities:

Description	Location (WGS84 : Lo29)	
	Y	X
Cemetery of 24 African graves, cemetery (to be relocated by Others)	-8,938.91	-2,873,824.05
Small farm labourer accommodation structure, possible burials adjacent to structure.	-7,703.69	-2,872,976.84

- xiv. Any areas disturbed during construction, including the *Contractor's* campsite and any temporary roads, are to be reinstated to their original condition.
- xv. Temporary stormwater management shall be provided by the *Contractor* during construction as per the relevant standards and/or regulatory requirements.
- xvi. The *Contractor* shall keep a record of all approved changes during construction and shall submit red-lined as-built drawings to the *Employer* for acceptance within 2 weeks of completion of the *works*.

## **2.8 EXECUTION OF CONSTRUCTION**

### **2.8.1 Construction Requirements**

The *Contractor* follows the requirements of the Water Use License, Environmental Authorisation and Environmental Management Programme (EMPr) as listed below.

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- i. Water Use Licence No 06/B20F/CIBG/10792 granted by Department of Water Affairs and Sanitation dated 23 September 2021.
- ii. Environmental Authorisation as detailed in letter by Department of Environmental Affairs Ref 12/12/20/2412, dated 19 July 2015.
- iii. Environmental Management Programme (EMPr) for the Kusile Power Station 60 Year Ash Disposal Facility, as detailed in Zitholele Consulting Report No : 12712-46-Rep-001-EMPr-Rev 1, dated 20 October 2014

### **2.8.2 Codes and Standards**

Tenderers clearly state what codes and standards are being proposed for the *works* should any such codes differ from those specified herein.

The *works* shall be executed in accordance with the requirements of the applicable South African National Standards (SANS) and the Eskom Standard Specifications specified herein.

Reference to standards or manuals of any society, organization, or association, whether such reference is specific or by implication, mean the latest standard, manual, or code in effect at the time of Contract Award, unless specifically stated otherwise. Except for technical requirements, no provision of any such standard, manual, or code shall be construed to imply any changes to the duties and responsibilities otherwise established in this Contract.

All onsite work practices shall be completed in accordance with the OHS Act, Eskom Kusile Project Specific Safety Plan and NFPA 241 - Standard for Safeguarding Construction, Alteration, and Demolition Operations.

The *Employer* may request that the *Contractor* submit samples of the types of materials to be used. Subject to approval by the *Employer*, such samples shall be retained for reference purpose for the duration of the *works*. The *Employer* may also request, and the *Contractor* shall provide, relevant certification for such samples, indicating compliance with the technical specifications.

All installations shall be inspected and witnessed by the *Employer* in accordance with this specification and the approved quality control plans for each activity.

### **2.8.3 Tolerances**

Tolerances are determined on the basis as stated in the relevant clauses of the applicable sections of SANS 1200, the Particular Specifications as detailed under Section 4.5.4 below, relevant drawings and manufacturers' specification where applicable. The *Contractor* warrants and ensures that all tolerances are complied with.

### **2.8.4 Testing**

#### **2.8.4.1 Testing Requirements**

The *Contractor* conducts all testing (where/if required) according to the relevant national standards.

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#### 2.8.4.2 Cost of Testing

The cost of testing undertaken by the *Contractor* in terms of his obligations under the Contract for purposes of process control, including the taking of samples, reinstating where samples have been taken and all testing equipment, labour, materials, etc. is included in the rates tendered for the various items of work supplied and are not paid for separately.

### 2.9 SAFETY, HEALTH, ENVIRONMENT

The *Contractor* adheres to the latest revision of the Construction Regulations, the Occupational Health & Safety Act and other relevant Safety, Health & Environmental regulations.

### 2.10 QUALITY CONTROL ASSURANCE

The requirements of the Quality Control Plan (QCP) apply in respect of the *Contractors* obligation to institute and implement a control system for monitoring the quality of the work and materials supplied.

The *Contractor* takes immediate steps to rectify any deviation from the specified requirements.

The *Employer*, *Project Manager*, *Supervisor* and their designated representatives shall have unencumbered access to Site and shall also have the right to inspect and be given all details of tests and testing procedures demonstrating that the *Contractor* is implementing adequate process-control systems.

#### 2.10.1 Producing of Certificates

Where the properties of materials or manufactures products are required in these specifications to comply with specifications published by a standards authority, the *Contractor* produces, when called upon to do so, certificates from the manufacturer confirming that the materials or products supplied comply with the relevant specifications. The cost of providing such certificates is borne by the *Contractor*. Where it is specified that a product complies with a SANS specification, it means that the product has been tested and evaluated in accordance with the requirements of the relevant SANS specification. Where the SANS mark is specified, a certificate is required.

### 2.11 HANDOVER

The *Contractor* is responsible for handover of all *works* associated with this Contract. The *Contractor* hands over to the *Employer* the completed *works* and makes good any defects that are identified during the handover inspection. The *Contractor* keeps a record of all changes during construction and submits red-lined drawings to the *Employer* for acceptance.

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### 3. DELIVERABLES

The *Contractor* provides:

- i. A detailed Programme providing durations of all activities that are included in these specifications or shown on the drawings or included in the Bill of Quantities (BoQ). The Programme shall be compiled and updated in accordance with the relevant provisions included in the Works Information.
- ii. Costing rates on the items as listed in the Bill of Quantities.
- iii. A Construction Quality Control Plan and/or Inspection Test Plan for review and acceptance by the *Employer* in accordance with the relevant provisions included in the Works Information.
- iv. On completion of the *works*, as-built surveys shall be provided to the *Employer*. These surveys shall be undertaken as the *works* progress and submitted for review and acceptance by the *Employer*.
- v. All deviations during construction from design drawings are submitted to the *Employer* for acceptance prior to implementation. Deviations are tracked and marked (red-lined) by the *Contractor* on a drawing set on-site. These marked up drawings are handed over to the *Employer* two weeks after construction is completed to inform the compilation of “As-Built” drawings.
- vi. The *Contractor* submits all data books within 2 weeks of construction completion for review and acceptance by the *Employer*.

### 4. PARTICULAR SPECIFICATIONS

#### 4.1 STANDARDISED SPECIFICATIONS

All *works* shall be performed to the specified standards or consistent with recognized, good industry norms and practices, to provide the *works* in a complete, fully functional, operable and compliant manner.

The *Contractor* adheres to the latest editions of the SANS 1200 standards listed in Table 2 below and the further standards for civil and structural engineering *works* as listed in Table 3, including all codes of practice, regulations and standards referenced therein and further variations as detailed in these Particular Specifications.

**Table 2 : SANS 1200 Specifications**

SANS 1200 A	General
SANS1200 C	Site Clearance
SANS1200 D	Earthworks
SANS1200 DK	Gabions and Pitching
SANS1200 GA	Concrete (Small Works)

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**Table 3 : Further Standards for Civil and Structural Engineering *Works***

<b>Code</b>	<b>Standard Title</b>
SANS 282 (2011)	Bending dimensions and scheduling of steel reinforcement for concrete
SANS 920 (2011)	Steel bars for concrete reinforcement
SANS 1083 (2014)	Aggregates from natural sources – Aggregates for concrete
SANS 2001-CC2 (2007)	Construction works Part CC2: Concrete works (minor works)
SANS 5862-1 (2006)	Concrete tests - Consistence of freshly mixed concrete - Slump test
SANS 10100-2 (2014)	The structural use of concrete Part 2: Materials and execution of work
SANS 50197-1 (2013)	Cement Part 1: Composition, specifications and conformity criteria for common cements
SANS 50197-2 (2000)	Cement Part 2: Conformity evaluation
SANS 51008 (2006)	Mixing water for concrete - Specification for sampling, testing and assessing the suitability of water, including water recovered from processes in the concrete industry, as mixing water for concrete
TRH14	Guidelines for Road Construction Materials : Committee of State Road Authorities : 1985

The sequential order of precedence for the applicable codes, standards, specifications and regulatory requirements shall be as follows:

- i. Government acts and regulations.
- ii. *Employer* specifications.
- iii. South African standards.
- iv. International standards.

Any errors, omissions, inconsistencies or discrepancies between the documents shall be brought to the immediate attention of the *Employer* for resolution, prior to construction.

Descriptions covering the required scope, type and quality of materials and the *works* to be performed by the *Contractor*, to be covered also in the tendered rates, are included in the bill of quantities, these specifications, the drawings, the referenced standardized specifications and contract documentation.

In certain clauses, the specifications allow a choice to be specified between alternative materials or methods of construction and for additional requirements to be specified to suit a particular contract. Details of such alternative or additional requirements applicable to this Contract are contained in these specifications, which also contain additional requirements for this particular contract.

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The number of the relevant clauses and payment items in these Particular Specifications consists of the prefix PS, followed by a number corresponding to the number of the relevant clause or payment item in the standard specifications, as and where applicable. The number of a new clause or payment item, which does not form part of a clause or a payment item in the standard specifications and is included here, is also prefixed by PS, followed by a new number. The new numbers follow on the last clause or item number used in the relevant section of the standard specifications.

The tendered rates shall, for each item, include the supply of materials, installation and construction, testing and commissioning, all as required to render the *works* complete and fully functional in every aspect upon final handover.

Where, in the bill of quantities, reference is not made to a standardized or a particular SANS 1200 clause, the descriptions included in the bill of quantities shall be read in conjunction with the relevant drawings and specifications and the item shall be priced accordingly.

## **4.2 PREAMBLE TO SANS 1200 SPECIFICATIONS**

Within SANS 1200 A: GENERAL, the following amendments and interpretations shall apply:

- i. Where the word or expression “Employer” is used, read “*Employer*”.
- ii. Where the word or expression “Contractor” is used, read “*Contractor*”.
- iii. Where the word or expression “Engineer” is used, read “*Employer*”, “*Project Manager*” or “*Supervisor*” as the context requires.

Within SANS 1200 A: GENERAL 2.3 DEFINITIONS, the following apply:

- i. “Acceptable, Approved (Approval)” is interpreted as either a *Project Manager* or a *Supervisor* communication or instruction in relation to compliance of the *works*, consistent with the Conditions of Contract, as the context requires.
- ii. “Adequate” is deleted. The *Project Manager* notifies the *Contractor* when and if the *works* are non-compliant.
- iii. Assessment and payment is in accordance with the Conditions of Contract and the ECC main and secondary options stated therein.

Within SANS 1200 A: GENERAL 2.6 APPROVAL, the following applies:

- i. “Approval” by either the *Project Manager* and/or the *Supervisor* is without prejudice to ECC Clause 14.1 and, inter alia, ECC Clauses 13.1, 14.3 and 27.1.

Within SANS 1200 A: GENERAL 7.1 PLANT, the following applies:

- i. Where the word or expression “Plant” is used, read “*Equipment*”.

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## 4.3 PSA : GENERAL

### 4.3.1 PSA-2 : Interpretations

#### PSA-2.3 : Definitions

Delete the last item under Section c) Measurement and Payment and replace with the following:

"No additional compensation of provisional and general costs will be made, which are attributable to a change in the value of the works."

#### PSA-2.8 : Items in Schedule of Quantities

##### PSA-2.8.1 : Principle

In the fourth line of sub-clause 2.8.1 after the words "applicable standardized specification", add "or particular specification".

Add the following:

"The pay item descriptions within the various sections of these specifications are intended to be for the guidance of the *Contractor* only. Detailed descriptions of the required *works* and materials are included in the specifications and the drawings."

### 4.3.2 PSA-3 : Materials

#### PSA-3.1 : Quality

Add the following:

"The onus rests on the *Contractor* to produce *works* which will conform in quality and accuracy of detail to the requirements of the drawings, the specifications, the Works Information and the bill of quantities and the *Contractor* shall, at his own expense (included in his rates), institute a quality control system and provide experienced technical staff together with all transport, instruments and equipment to ensure adequate supervision and positive control of the *works* at all times. The *Contractor* shall keep the *Employer* fully informed on all aspects of the quality control system.

Alternate materials proposed by the *Contractor* shall require the approval of the *Employer* prior to being used as part of the *works*. Further test results may be required prior to the acceptance of such materials by the *Employer*. The costs of these tests shall be borne by the *Contractor*.

Where specified or directed by the *Employer*, the *Contractor* shall submit to the *Employer* samples of the materials that are to be used, for the approval of the *Employer*, prior to their incorporation in the *works*. Samples may also be required to serve as standards to be applied to construction methods, (e.g. surface finishes) for the duration of the contract. The costs of all tests and samples shall be borne by the *Contractor*.

No crushed rubble or crushed concrete materials shall be used in the earthworks or layerworks.

It is the *Contractor's* responsibility to confirm that all necessary materials are available to successfully complete the *works* within the contract period. No claims based on the non-availability of materials will be considered.

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The *Contractor* shall inform the *Employer* of any testing to be done at least 24 hours before such tests are required and must allow in his program for the time necessary for the tests and the processing of the test results.

#### **4.3.3 PSA-4 : Plant**

PSA-4.2 : *Contractor's* Office, Stores and Services

Replace the third paragraph with the following:

“Upon completion of the *works*, and with the written consent of the *Employer*, the Site establishment shall be removed. The whole area of the Site establishment, temporary access roads and other working areas, shall be cleared and appropriately re-vegetated where necessary. Where existing road surfaces have been damaged by the *Contractor*, the *Contractor* shall re-surface the road to at least its original state prior to construction, including all applicable layerworks.

Walls, fences, hedges and access to other properties damaged by the *Contractor* shall also be replaced and/or repaired. The cost of all such remedial *works* shall be deemed to be included in the rate for removal of Site establishment.”

Clause 4.2 : *Contractor's* Offices, Stores and Services

Add the following:

" The *Contractor* shall establish a camp site at the designated area indicated under Part C4 - Site Information. The *Contractor* will have to provide all services and utilities, including security, at the designated camp site. All temporary facilities, including ablution facilities, shall comply with the requirements of the Local Authority.

The *Contractor* shall ensure that the area is properly fenced and secured at all times and provide all access control. The area may only be used for offices, stores, repair shops and other activities required for the *works*. Accommodation of the *Contractor's* staff at the campsite, apart from security personnel, will not be permitted. The *Contractor* shall make his own arrangements to house his employees and transport them to Site.

Adequate chemical ablution facilities shall be provided and maintained on Site.

The camp site shall be rehabilitated to its original standard prior to handing back to the *Employer*.”

#### **4.3.4 PSA-5 : Construction**

PSA 5.1.1 Setting Out of the *works*:

Add the following:

“The *Employer* will provide benchmarks for the setting out of the *works*, located within the precinct of the existing Kusile Power Station.



Setting out of the *works* is the sole responsibility of the *Contractor*. The *Contractor* shall, within two (2) weeks after the Site has been handed over to him, or drawings issued for construction, verify the correctness of all setting out points. Any discrepancy shall immediately be reported to the Project Manager.

#### Clause 5.5 : Dealing with Water on *works*

Add the following:

“The *Contractor* shall be responsible for and shall repair at his expense any damage to any part of the *works* caused by floods, water or failure of any part of the dewatering and flood protection systems instituted by the *Contractor*. The *Contractor* shall furthermore ensure that the effectiveness of the methods used to deal with water on the *works* is continuously monitored. The cost of all flood protection and dewatering measures shall be included in the tendered rates. Methods of dewatering and flood protection shall be in accordance with the DFFE and DWS requirements as referenced under Section 2.8.1 above.

#### Clause 5.6 : Pollution

Add the following:

“The *Contractor* shall ensure that all construction debris (e.g. cement bags, timber, wire, nails, etc.) waste and surplus food, food packaging, litter, organic waste and the like are properly collected and disposed of at a registered waste disposal site approved by the *Employer*. Waste bins shall be provided on Site as necessary, to collect such debris prior to disposal.”

#### PSA-5.8 : Ground and Access to *Works*

Add the following:

“Upon completion of the *works*, the *Contractor* shall restore the existing ground surface, including roads and tracks, outside of the new construction footprint that were disturbed during the construction activities to their original condition. Excess materials shall be removed and all temporary excavations shall be filled with material similar to the adjoining natural ground. Boundary fences, which may have been removed or damaged during construction, shall be repaired and reinstated.

The *Contractor* shall remove from Site all temporary facilities and infrastructure used during the performance of construction activities.

The cost of these restoration *works* shall be provided for in the tendered rates by the *Contractor*.”

### 4.3.5 PSA-6 : Tolerances

Delete this clause. The tolerances applicable to the *works* shall be as stated under Clause 4.5.4 below.

### 4.3.6 PSA-7 : Testing

#### PSA-7.2 : Approved Laboratories

Add the following:

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"All required quality control tests shall be performed by a SANAS-registered service provider. The *Contractor* is not required to provide an approved field laboratory on Site. The tendered rates shall include full compensation for all quality control tests."

#### 4.3.7 PSA-8 : Measurement and Payment

Change payment item 8.3 to read as follows:

"PSA-8.3 : Scheduled Fixed-Charge Items"

8.2.2 : Time-related Items

Delete the note at the end of this clause and replace as follows:

"Any compensation attached to extensions of time granted by the *Employer* shall be dealt with in accordance with the relevant provisions of the ECC."

#### 4.4 PSC : SITE CLEARANCE

##### 4.4.1 PSC-5 : Construction

PSC-5.1 : Areas to be Cleared and Grubbed

Delete this clause and replace as follows:

"Clearing and grubbing will be limited to localised clusters of shrubs and trees within the footprint of the channel which will be delineated by the *Project Manager* on Site, to include working space for equipment required for the execution of the *works*. Clearing and grubbing is not required within existing farmlands or adjoining fallow land."

##### 4.4.2 PSC-8 : Measurement and Payment

PSC-8.2.1 ; Clear and Grub

Delete this item and replace as follows:

"Clear and Grub ..... Unit : Ha

The area designated by the *Project Manager* will be measured to the nearest 0.1 Ha. The rate shall cover the cost of cutting of trunks and branches of shrubs and trees, regardless of girth sizes, into transportable lengths, de-stumping and removal of the roots of shrubs and trees removal within the designated areas, backfilling of cavities and disposal of all organic materials within a haul distance of 1.0 km."

#### 4.5 PSD : EARTHWORKS

##### 4.5.1 PSD-2 : Interpretations

PSD-2.3 : Definitions

Delete and replace definitions for freehaul and overhaul as follows:

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“The cost of haulage of all excavated materials from within the footprint of the channel to the designated spoil site shall be included under pay item 8.3.2. Separate payments will not be made for overhaul.”

#### **4.5.2 PSD-3 : Materials**

PSD-3.1 : Classification for Excavation purposes

Delete this clause and replace as follows:

“a) Soft excavations

Soft excavations shall include all materials, except materials that can only be loosened by blasting. No distinction will be made between soft and intermediate excavations.

b) Hard excavation

Hard excavation shall be materials that can only be loosened by means of blasting.”

PSD-3.3.1 : General

Delete this clause and replace as follows:

“All topsoil within the footprint of the new channel shall be removed to a depth of 150 mm and placed in a windrow adjacent to the *works* area, for re-use as part of the channel lining.

All topsoil within the footprint of the designated spoil site shall be removed to a depth of 150 mm and retained adjacent to the spoil site, for re-use and revegetation of the stockpiles of excavated materials once all excavated materials have been deposited at the spoil site and the stockpiles have been shaped and landscaped.”

#### **4.5.3 PSD-5 : Construction**

PSD-5.2.2.1 : Excavations for general earthworks and structures

Add the following:

“f) Bulk excavations for the clean water cut-off channel shall be done using excavation equipment. Batter boards shall then be erected at 10 m intervals and final trimming, including removal of oversize materials (in excess of 150 mm diameter) by hand to the tolerances as specified under Section 4.5.4 below. The base and banks of the channel shall be lightly watered and compacted using hand-held equipment (plate compactors or the like) prior to re-spreading of topsoil and hydroseeding as described under PSD-5.2.4.3 below.”

PSD-5.2.2.3 : Disposal

Add the following:

“All excavated materials shall be taken to the designated spoil site, as detailed in Section C.4 : Site Information. The stockpiled materials shall be placed to a height not exceeding 3.0 m. Upon completion of spoiling of the excavated materials the stockpile the top and embankments of the stockpile shall be neatly shaped with slope batters no steeper than 1(V) : 2 (H). Retained topsoil shall be evenly spread across the full extent of the stockpiles prior to hydroseeding as described under PSD-5.2.4.3 below.”

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PSD-5.2.4.2 : Topsoiling

Change the final thickness of topsoil to 120 mm.

PSD-5.2.4.3 : Grass or other vegetation

Add the following:

“The following mixture shall be used for hydroseeding of the finished channel base and banks as well as the stockpile of spoil materials at the designated spoil site:

ii.	Cynodon dactylon	10 kg/ha
iii.	Eragrostis curvula	5 kg/ha
iv.	Chloris gayana	8 kg/ha
v.	Digitaria erianthus	8 kg/ha
vi.	Eragrostis teff	3 kg/ha
vii.	Total seed	34 kg/ha
viii.	Fertilizer : 2.3.4(30)zn	400 kg/ha
ix.	Urea	150 kg/ha
x.	Hydropam soil stabilizer	15kg/ha

Prior to application of the hydroseed mix the *Contractor* shall manually cut small furrows horizontally along the embankment at 300mm centres. The topsoil soil shall be loose and moist before any hydroseeding commences.

The specified seed mix and fertiliser as detailed above shall be applied using an approved hydroseeding machine in such a manner as to ensure even distribution of seed and fertiliser throughout. The seedbed shall be kept moist after hydroseeding until good germination is achieved."

PSD-5.2.5.1 : Freehaul

PSD-5.2.5.2 : Overhaul

Delete these clauses. The cost of all haulage of excavated materials to the designated spoil site shall be included under pay item 8.3.2.

#### **4.5.4 PSD-6 : Tolerances**

PSD-6.1 : Position, Dimensions, Levels etc.

Delete this clause and replace as follows:

“The permissible deviations from the lines and levels for the channel base and embankments as shown on the drawings shall be as follows:

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**Table 4 : Tolerances**

Finished levels along base and embankments of channel after topsoiling	$\pm 150$ mm
Horizontal (X-Y) alignment along breakpoint between base and embankment of channel :	$\pm 200$ mm
Horizontal (X-Y) alignment along breakpoint between embankment and top of channel :	$\pm 300$ mm

#### **4.5.5 PSD-8 : Measurement and Payment**

##### **PSD-8.1 : Basic Principles**

Delete Clause 8.1.1 and replace as follows:

“The basic principles of measurement and payment for earthworks are that the rates tendered for excavation shall cover the cost of excavating materials within the footprint of the channel and disposing of the excavated materials at the designated spoil site, regardless of the haul distance. The scheduled rate shall include the cost of final trimming of the channel, as described under PSD-5.2.2.1 above as well as the cost of final shaping of the spoil site, as described under PSD-5.2.2.3 above.”

##### **PSD-8.2 : Computation of Quantities**

The measured quantity for excavations shall be as described under Clause 8.2.1 b).

PSD-8.3.1.1 : Remove topsoil to nominal depth 150 mm (or other stated depth), stockpile and maintain

Delete the pay item description and replace as follows:

“The rate shall cover the cost of removing topsoil, together with vegetation and small roots and placing in a windrow adjacent to the channel excavation or stockpiling at the designated spoil site. The quantity for payment purposes shall be the multiple of the length and width of the area over which topsoil is removed, as agreed with the *Project Manager*, multiplied by the depth of 150 mm.”

##### **PSD-8.3.2 : Bulk Excavation**

Delete this clause and replace as follows:

- a) Excavate in all materials and dispose at designated spoil site .....Unit : m<sup>3</sup>  
b) Extra-over for excavation in hard rock.....Unit : m<sup>3</sup>

The rate for Item a) shall cover the cost of complying with all precautions in terms of 5.1 and PSD-5 in addition to the cost of excavation, loading, transportation, offloading, spreading, watering, compacting, final grading and complying with the requirements for tolerances, all in accordance with the requirements of the specification.

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The rate for Item b) shall cover all costs for blasting, including breaking down and removal of blasted material to the designated spoil site. The quantity of hard rock shall be determined by detailed survey of the affected area prior to blasting operations, to be certified by the *Project Manager*.”

#### 4.6 PSDK : GABIONS AND PITCHING

PSDK-2 : Interpretations

Replace definition for Item 2.3.5 : Geomembrane as follows:

“A4 Bidim Polyester Geotextile or similar approved.”

### 5. RECEIVABLES

This section lists the drawings and other documents that are provided by the *Employer* for the *works*. These drawings and documents are included as attachments, bound herein, or are separate electronic files. The Tenderer’s pricing accounts for any and all drawings, specification revisions, and BoQ revisions issued to the Tenderer prior to tender submittal.

#### 5.1 DRAWINGS

The following listed drawings are included as Attachments and shall form part of the *Employer’s* Specification. These drawings are issued for tender purposes. Approved for construction drawings will be issued after contract award.

**Table 5: Clean Water Cut-Off Channel Drawings**

<i><b>Consultant</b></i>	<i><b>Employer’s Drawing No.</b></i>	<i><b>Rev.</b></i>	<i><b>Title</b></i>
22020-TO1-CE-DAL-001 Sht 1	TBC	00	General Arrangement : Layout Clean Water Cut-Off Channel
22020-TO1-CE-DAL-001 Sht 2		00	Plan and Long Sections : Clean Water Cut-off Channel (1 of 6)
22020-TO1-CE-DAL-001 Sht 2		00	Plan and Long Sections : Clean Water Cut-off Channel (2 of 6)
22020-TO1-CE-DAL-001 Sht 2		00	Plan and Long Sections : Clean Water Cut-off Channel (3 of 6)
22020-TO1-CE-DAL-001 Sht 2		00	Plan and Long Sections : Clean Water Cut-off Channel (4 of 6)
22020-TO1-CE-DAL-001 Sht 2		00	Plan and Long Sections : Clean Water Cut-off Channel (5 of 6)
22020-TO1-CE-DAL-001 Sht 2		00	Plan and Long Sections : Clean Water Cut-off Channel (6 of 6)
22020-TO1-CE-DRD-003		00	Clean Water Cut-off Channel Cross-Sections

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## 5.2 OTHER DOCUMENTATION

The following listed documents are for information purposes only and shall form part of the Specification

**Table 6: Additional Documentation**

Document No.	Rev No	Title
AB-Z-Z-AN-0001	0	Kusile User Requirement Specification
146838.23.0200	-	Kusile Project Design Manual
GGR 0992	1	Plant Safety Regulations
203-79326		Kusile Engineering Change Management Work Instruction
203-103437		Technical Documents Submittal and Review <i>works</i> Instruction
240-54179170		Technical Documentation Classification and Designation Standard
200-5343	1	Standard Abbreviations

## 6. AUTHORISATION

This document has been seen and accepted by:

Name & Surname	Designation
Ruan Beneke	Kusile 60Y ADF EDWL
Yuvir Gokul	Kusile Project EDWL
Terrance Mavunda	Kusile Civil & Structural Engineering Manager
Ayodele Jimoh	Kusile Civil & Structural Lead Discipline Engineer
Reinhard Nachenius	EPCM Civil Engineer
Samuel du Rand	EPCM Project Manager

## 7. REVISIONS

Date	Rev.	Compiler	Remarks
May 2022	0.1	R. Nachenius	Draft for review
May 2022	1.0	R. Nachenius	Final document

## 8. DEVELOPMENT TEAM

The following people were involved in the development of this document:

- Ruan Beneke
- Reinhard Nachenius

## 9. ACKNOWLEDGEMENTS

N/A

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## APPENDIX A- DOCUMENT MANAGEMENT REQUIREMENTS

### 1. DOCUMENTATION MANAGEMENT AND COMMUNICATION

The documentation requirements cover the various engineering stages, from the design stage through fabrication, installation, testing and commissioning and most importantly for the operating, maintenance, and training stage of the project. The *Contractor* ensures that the Technical Documents and Records Management Work Instruction (240-76992014) is used for any documentation requirements. The *Contractor* is responsible for the compilation and the supply of the documentation during the various project stages and to provide the documentation programme to link with the milestone dates. Documentation and drawings are programmed for delivery to meet the milestone dates and in accordance with the agreed VDSS.

#### 1.1 SUBMITTAL REQUIREMENTS

*Contractor* Engineering program shall allow a minimum of 21 days for mailing, processing, and review of drawings, documents and data by the *Employer*. The *Contractor* is responsible for the compilation and the supply of all the documentation required during the various project stages and to provide the documentation programmed to link with the milestone dates. Documentation and drawings are programmed for delivery to meet the milestone dates and in accordance with the agreed Vendor Document Submittal Schedule (VDSS) in Appendix B.

*Contractor* documents submittals are provided in accordance with the Vendor Document Submittal Schedule (VDSS) which is included in Appendix B. *Contractor* documents all documentation that will be sent to the *Employer* in the Master Document List (MDL) as provided by the *Employer* in Appendix C. All documentation, including reports, manuals, etc. is in the English language.

If the *Contractor* makes further changes to the equipment and materials shown on submittals that have been reviewed by the *Employer*, the changes shall be clearly marked on the submittal by the *Contractor* and the submittal process shall be repeated. If changes are made by *Contractor* after delivery to the Plant, as-built drawings indicating the changes shall be prepared by *Contractor* and submitted to *Employer* for review. Any resubmittal of information shall clearly identify the revisions by footnote or by a form of back-circle, with revision block update, as appropriate.

1. All document exchange shall be done using formal Transmittals. The following is the minimum information required for sending transmittals:

- Title of the document
- Reason for issuing/submission
- Transmittal Number
- Transmittal Name
- Transmittal Description
- Contract Number
- Package Number

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- Transmittal purpose
  - Sender Name
  - Sender E-Mail
  - Sender Organisation
  - Recipient Name
  - Recipient E-Mail
  - Recipient Organisation
  - Disclosure Classification
  - Date received
  - Quantity of documentation referenced on the transmittal
  - Number of copies
  - Format/medium submitted (e.g. paper, USB, etc.)
  - Sender signature
  - Recipient signature, once submitted, to acknowledge receipt
2. If a transmittal is in response to an Eskom communication via transmittal, the Eskom Transmittal Number shall be referenced in the transmittal response and shall be provided in addition to the meta-data required as indicated above.
  3. The *Contractor* shall follow a structured and standard definition for Transmittal Descriptions, i.e. a subject line convention of YYYYMMDD – <Contract & Package Number> – <Vendor> – <Short Description> – <Sender Initials>.
  4. The *Contractor* shall follow a structured method of communication as defined within Communication Interface Memorandum (CIM) for any correspondence
  5. The *Contractor* shall follow a structured and standard definition for email subjects i.e. a subject line convention of YYYYMMDD – < Package File Number> – > – <Email Subject line>.
  6. The *Contractor* shall select the purpose for transmittal in line with the standard Eskom Selection Criteria:
    - Issued for Approval
    - Issued for Award
    - Issued for Basic Design
    - Issued for Commissioning
    - Issued for Concept Design
    - Issued for Consideration
    - Issued for Construction
    - Issued for Detail Design
    - Issued for Document Review
    - Issued for Handover
    - Issued for Information

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- Issued for Installation
- Issued for Manufacturing
- Issued for Procurement
- Issued for Review
- Issued for Tender

The *Contractor* is to use the applicable transmittal reference from the list above.

7. Issuing of documents with different transmittal purposes shall be done separately and shall not combined into one transmittal. This will ensure fast and efficient processing of incoming and outgoing transmittals and information exchange.

Electronic technical data submittals shall be made using the Eskom Document Control email address (KusileDocControl@eskom.co.za) and *Zendto*, a Web-based file transfer service. If *Contractor* does not already have *Zendto* transmittal capability, information is available at <https://zendto.eskom.co.za/>. (The Uniform Resource Locator [URL] to be used for electronic file submittals will be made available upon Contract award.)

*In case of email submission, the Contractor should note that if a single file to be transmitted is over 20MB in size, then the document shall be uploaded on Zendto portal.*

Notification to *Employer* that submittal have been posted to *Zendto* shall be in accordance with the correspondence requirements of this Contract. *For the Zendto submission, a transmittal record must be submitted to the project email document control address information the Employer of such a submission.*

Two hard copy prints shall be submitted to the address indicated for Technical Documents in the Supplementary Terms and Conditions of this Contract. The *Contractor* submits documentation to the Eskom Representative as well as the Project's Documentation Centre in the following media:

- Electronic copies can be submitted to Eskom Documentation Centre through generic email address agreed to by the project. Electronic copies large for email will be delivered on USB or any form of an external drive, large file transfer protocol and/or hard drives to the Project Documentation Centre. A notification email, with the transmittal note attached, shall be sent to the project generic email address. The Representative will be copied on the email as well.
- Hard copies shall be submitted to the Eskom Representative accompanied by the Transmittal Note.

b. Drawings

All drawings must be issued to Eskom in both native CADD format and PDF format as per 240-86973501 (Engineering Drawing Standards – Common Requirements).

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Drawings shall be in sufficient detail to indicate the kind, size, arrangement, component weight, breakdown for shipment, and operation of component materials and devices; the external connections, anchorages, and supports required; the dimensions needed for installation and correlation with other materials and equipment; and the information specifically requested in the Schedule of Submittals.

*Contractor* shall fully complete and certify drawings for compliance with the Contract requirements. Drawings shall have title block entries that clearly indicate the drawing is certified.

Each submitted drawing shall be project unique and shall be clearly marked with the name of the project, unit designation, *Employer's* Contract title, *Employer's* Contract file number, project equipment or structure nomenclature, component identification numbers, and *Employer's* name. Equipment, instrumentation, and other components requiring *Employer* -assigned identification tag numbers shall be clearly identified on the drawings. If standard drawings are submitted, the applicable equipment and devices furnished for the project shall be clearly marked.

Transmittal letters shall identify which Schedule of Submittals item (by item number) is satisfied by each drawing or group of drawings. The transmittal letter shall include the manufacturer's drawing number, revision number, and title for each drawing attached. Each drawing title shall be unique and shall be descriptive of the specific drawing content. Transmittal letters for resubmitted drawings shall include the *Employer's* drawing numbers.

The *Contractor* includes the *Employer's* drawing number in the drawing title block. This requirement only applies to design drawings developed by the *Contractor* and his *Sub-Contractors*. It does not apply to drawings developed by manufacturers for equipment and material such as valves, instruments, etc. Drawing numbers will be assigned by the *Employer* as drawings are developed.

The project name shall be listed on all drawings, including manufacturers' drawings. Tag numbers and equipment names shall be listed on all manufacturers' drawings. A separate sheet may be attached to the submittal if needed to adequately list all tag numbers associated with the drawings such as valves or instruments which may have numerous tag numbers associated with it.

The language of all documentation shall be in the English language. The units of measure shall be metric.

The *Contractor* retains project design calculations and information for the entire life cycle of the plant and provides these to the *Employer* on prior written notice at any time notwithstanding the expiry or termination of the contract.

c. Drawing Submittal

All documents and records management will be performed according to Project/Plant Specific Documents and Records Process. Any uncertainty regarding this should be clarified with the *Employer*. The *Contractor* shall comply with all minimum document metadata as specified in Technical Documentation Classification and Designation Standard (240-54179170).

*Contractor* shall submit electronic copies of the documents using a fully secure web based solution providing carefully controlled access to appropriate project information for authorized personnel.

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All electronic design data and documents shall be in such a form which will enable importing such data, documents and drawings, including 3-dimensional drawings, seamlessly into the Intergraph SPF (Smart Plant Foundation) system. Hard copy submittals will only be required for the IOM Manuals and final as-built submittals.

Transmittal letters shall be provided with each document submittal. The transmittal letter shall include the *Contractor* drawing number, revision number, and title for each drawing attached. Each drawing title shall be unique and shall be descriptive of the specific drawing content.

Catalog pages are not acceptable, except as drawings for standard non engineered products and when the catalog pages provide all dimensional data, all external termination data, and mounting data. The catalog page shall be submitted with a typed cover page clearly indicating the name of the project, unit designation, specification title, specification number, component identification numbers, model number, *Contractor* drawing number, and *Employer's* name. Drawings shall be submitted with all numerical values in metric units.

d. Information Requirements

The *Employer* requires drawings, documentation, plans, information and data (collectively "Information") from the *Contractor* for two fundamental purposes; namely for the management and execution of the Contract and for the operation, maintenance and support of the *works* during its entire operational phase until disposal and decommissioning.

The *Contractor* shall, during the progress of and upon completion of the *works*, supply the Information required in terms of the Contract and all such Information as may usually be supplied in connection with similar *works*, including, whether or not specified in the Contract, all Information necessary or useful for:

1. Design reviews and the interface management of the *works* with the Project *works*;
2. Quality assurance and control; and
3. The operation, maintenance, support, inspection, integrity management, training and technical optimization of the *works*, over the lifecycle thereof.

The scope of supply of Information from the *Contractor* shall include documents, lists and data according to the types defined in Table 1 below. The document requirement list below is not exhaustive, all documents, lists and data as specified by the relevant SANS standard should be submitted to the *Employer* by the *Contractor*.

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**Table 7 : Typical Document Requirement List**

<b>Document Group</b>	<b>Description of document type (includes information data sets)</b>
General	<p>Material handling flow diagrams</p> <p>Procurement schedule</p> <p>Equipment list</p> <p>Valve list</p> <p>Pipeline list</p> <p>Interface list</p> <p>Equipment specifications &amp; data sheets</p> <p>Drawings and data for all equipment and material</p> <p>Installation, Operation, and Maintenance (IOM) Manuals</p> <p>Spare parts list</p> <p>Factory Acceptance Test (FAT) report</p>
Quality Assurance	<p>Quality assurance manual</p> <p>Quality control plans</p> <p>Quality control reports</p> <p>Weld summary index</p> <p>Material traceability certificates</p> <p>Manufacturing test reports</p> <p>Manufacturing Non-Conformance Reports (NCR's)</p>
Civils & Structures	<p>Test certificates</p>
Construction	<p>Site management plan (QA, Safety, Environmental etc.)</p> <p>Construction schedule</p> <p>Site storage requirements for major equipment</p> <p>Construction test records (concrete strength, permeability test, etc.)</p> <p>Maintenance records for all equipment while stored on site</p>

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Document Group	Description of document type (includes information data sets)
Commissioning	Commissioning schedule Test & Evaluation Master Plan (TEMP) Commissioning procedures Commissioning database Performance test procedure Performance test reports Field test reports and certificates
Operations	Operating procedures/manuals Plant operational documentation Plant tech specs Incident & upset mitigation procedures
Logistic Support	Maintenance concept/manuals Plant maintenance documentation
Training	Training plan Training manuals and instructions
Safety & Protection	Waste management plan

In addition to the official documentation submittals listed in Appendix D, the *Contractor* shall provide additional information for review and design coordination as requested by the *Employer* from time to time.

The *Contractor* shall use the *Employer's* SmartPlant Environment and all design tools as the delivery mechanism for all project data and document deliverables. The EDMS and design tools shall be provided to the *Contractor* pre-configured based on *Employer's* data handover requirements. Any project data and document deliverables not generated from design tools provided by the *Employer* shall be supplied in a format specified by the *Employer*.

The *Project Manager* reviews the *Contractor's* submitted documents. The *Contractor* ensures adherence to the *works* Information and that a technically sound design approach is incorporated. Specific information required from the *Contractor* during tender phase and as part of the *works* are as set-out in the VDSS, in Appendix B – Vendor Document Submittal Schedule. Each document submitted to the *Project Manager* requires a transmittal note (refer to *Employer's* template 240-71448626 for minimum metadata requirements) from the *Contractor*. The *Contractor* includes interpretation of results in every report compiled.

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All project documents are submitted to the *Project Manager* in accordance with Project / Plant Specific Technical Documents and Records Management Work Instruction (240-76992014). The *Contractor* is required to submit documents as electronic and hard copies and both copies must be delivered to the *Project Manager* with a transmittal note.

e. Documentation recording

The *Contractor* develops, documents and maintains the Master Document List (MDL) with all the required metadata which are submitted to the Employer in the monthly basis for tracking purposes irrespective of whether there are updates or not. The MDL includes a list of drawings and documents which contains the following minimum information for each document:

- Date of submission
- Transmittal number
- Transmittal title
- Document description

Document number (both *Contractor* and Employer)

- Document Type
- Revision number
- Document Approval Status
- Document Authorisation Status (i.e. Accepted With Comments, Not Accepted with Comments, Accepted).
- Transmittal reason for Issue

In addition, the *Contractor* adheres to the following standards:

- Project / Plant Specific Technical Documents and Records Management Procedure (240-531144186)
- SmartPlant for Owner Operators (SPO) Documentation Metadata Standard (240-58552870)
- SmartPlant Data Take-On Standard (240-107305502)

f. Identification of the Documentation

The *Contractor* shall ensure that documents have the following minimum attributes on the cover page:

- Title of the document
- Document Unique Identification number (Eskom number)
- *Contractor* Document number, if applicable
- Document status
- Revision number
- Document Type
- Document security level
- Document revision table/history

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- Page number on the footer
- Document Author/Authoriser/
- Document Originator *Contractor*

The following additional attributes are important for technical documents:

Package/System name, sub-system if applicable

- Unit/s number
- *Contractor* name
- *Contractor* number
- Plant Identification Codes

g. Format and Layout of Documents

For consistency it is important that all documents used within a specific domain follow the same layout, style and formatting standard.

h. Layout and Typography

Every document should comply with the following font specifications:

- Font Colour: 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
- 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)

i. Document Headers

The header should include the project name, document title, document number, revision number and page number.

j. Naming of files

The *Contractor* will comply with the Eskom standard for naming documentation files. The standard is as follows:

For documents that have approval date and signature

(YYYYMMDD\_DocType\_DocumentTitle\_UniqueIdentifier\_Revision.FileExtention)

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For documents that do not necessarily require the 'Approved Date' and 'Revision & Versioning', use the date of update

(YYYYMMDD\_DocType\_DocumentTitle\_UniqueIdentifier\_Revision.FileExtention)

All further requirements shall be according to IEC 61355 – 1:2008 (Edition) Classification and designation of documents for plants, systems and equipment – Part 1: Rules and classification tables.

## **1.2 DOCUMENTATION REQUIREMENTS**

All documents supplied by the *Contractor* are subject to Eskom's approval. For consistency, it is important that all documents used within the project follow the same layout, style and formatting as described in the Technical Documents and Records Management Work Instruction (240-76992014). Documents such as QCP's, Method Statements and other documents impacting the work is accepted by the Employer at least 3 working days prior to commencement of the *works*. Each revision of a document or drawing is accompanied with a list of the comments made by the Employer on the previous revision if applicable and the response/corrective action taken by the *Contractor*. Changes are recorded in a revision table contained in each drawing/document. Documents and drawings indicate the Employer's number as allocated by the Employer. The *Contractor* may have his own internal document or drawing number on the document or drawing, but where reference is made among documents, the Employer's number is used as the reference number. The *Contractor* compiles a complete data book for all work done during manufacturing, construction and commission containing the following as a minimum if applicable:

- Scope of work.
- Approved "As built" drawings.
- Approved QCP / ITP.
- Inspection reports.
- All CAR's and corrective actions

The *Contractor* submits documentation to the Eskom Representative as well as the Project's Documentation Centre in the following media:

- Electronic copies are submitted to Eskom Documentation Centre through generic email address agreed to by the project. Electronic copies large for email are delivered on external drive, large file transfer protocol to the Project Documentation Centre. A notification email, with the transmittal note attached, is sent to the project generic email address. The Representative is copied on the email as well.
- Hard copies are submitted to the Eskom Representative accompanied by the Transmittal Note.

The Contractor ensures two (2) sets of documentation are supplied, one (1) set in the form of an electronic format (dwg, dgn, native files and pdf) and one (1) set of paper prints.

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### 1.3 CONFIGURATION MANAGEMENT

The *Contractor* supplies a comprehensive configuration management program according to ISO 10007 (2<sup>nd</sup> Edition) to ensure that plant structures, components and computer software conform to approved design requirements. However, a project specific Configuration Management Plan document will be developed which will be aligned to ISO 10007. In addition, the *works* as-built physical and functional characteristics shall be accurately reflected in selected documents and databases, including those for design, procurement, construction, operation, testing and training. The configuration program shall be applicable for use throughout all phases of the project life cycle, including management of spare parts, replacement parts and product upgrades, and shall form part of deliverables for hand-over to the *Employer* for use during the operation and maintenance phases of the plant.

a. Change Management

All Design change management shall be performed in accordance to the latest revision of the Kusile Engineering Change Management Work Instruction (203-79326) and the *Employer* shall ensure that *Contractor* is provided with latest revisions of this procedure. Any uncertainty regarding this procedure should be clarified with the *Employer* and clarification updates should be reflected in updated versions of this procedure.

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APPENDIX B- VENDOR DOCUMENT SUBMITTAL SCHEDULE

VENDOR DOCUMENT SUBMITTAL SCHEDULE													
ITEM	SUBMITTAL ITEMS	CALANDER DAYS	PROJECT STAGES										
			PROCUREMENT SPECIFICATION FOR SUBCONTRACTORS	CONTRACT AWARD	ORDER	DESIGN FREEZE	MANUFACTURING AND ASSEMBLY	FACTORY ACCEPTANCE TESTING (FAT)	FACTORY RELEASE	DELIVERY	INSTALLATION	SITE ACCEPTANCE TESTING (SAT)	SYSTEM HANDOVER

APPENDIX C - MASTER DOCUMENT LIST

Kusile Power Station – COMPANY NAME									
DRAWINGS AND SPECIFICATION SCHEDULE									
Doc Code	Rev.	Cust. Doc No.	Title	Action	Actual date	Client receipt date	Client Document status	Client ref letter for doc status	Document status

## APPENDIX D– DOCUMENTATION REQUIREMENTS FOR FINAL HANDOVER

Dossier Chapter	Dossier Sub-Chapter	Dossier Sub-Sub Chapter	Documents for Final Handover
Engineering Documentation	1.1	1.1	Risk Assessments
	1.2	1.2	Non-Conformance Management
Commissioning Documentation	2.1	2.1	Commissioning Procedure / Manual
	2.2	2.2	Handover Certificate
	2.3	2.3	Commissioning Certificate
Project Execution	Mechanical	3.1.1	<i>Contractor</i> Application for Eskom's Inspection of the <i>works</i> /Part of the <i>works</i>
		3.1.2	Data Pack (e.g. Material Certificates, Qualifications, NDE and Welding Documentation, Cutting Instructions, Factory Design Review Reports, etc.)
		3.1.3	Partial/final Inspection certificate
		3.1.4	Defects Notification Certificate/Clearance
		3.1.5	Safety and Housekeeping Certificate
		3.1.6	Safety Clearance Certificate

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Dossier Chapter	Dossier Sub-Chapter	Dossier Sub-Sub Chapter	Documents for Final Handover
		3.1.7	Completion Certificate
		3.1.8	Defects Certificate
		3.1.9	Take over Certificate
		3.1.10	Specific Requirements
		3.1.11	KKS and Labelling Certificate
	Civil	3.2.1	<i>Contractor</i> Application for Eskom's Inspection of the <i>works</i> /Part of the <i>works</i>
		3.2.2	Data Pack (e.g. Material Certificates, Qualifications, NDE and Welding Documentation, Cutting Instructions, Factory Design Review Reports, etc.)
		3.2.3	Partial/final Inspection certificate
		3.2.4	Defects Notification Certificate/Clearance
		3.2.5	Safety and Housekeeping Certificate
		3.2.6	Safety Clearance Certificate
		3.2.7	Completion Certificate
		3.2.8	Defects Certificate
		3.2.9	Take over Certificate
		3.2.10	Specific Requirements

### CONTROLLED DISCLOSURE

When downloaded from the EDMS, this document is uncontrolled and the responsibility rests with the user to ensure it is in line with the authorised version on the system.

Dossier Chapter	Dossier Sub-Chapter	Dossier Sub-Sub Chapter	Documents for Final Handover
		<b>3.2.11</b>	KKS and Labelling Certificate
<b>Test and Statutory Certificates</b>	<b>4.1</b>	<b>4.1</b>	Factory Acceptance Test (FAT)
	<b>4.2</b>	<b>4.2</b>	Site Acceptance Test (SAT)
	<b>4.3</b>	<b>4.3</b>	Inspection Test Procedures (ITP's)
	<b>4.4</b>	<b>4.4</b>	QCP's / QIP's (signed off)
	<b>4.5</b>	<b>4.5</b>	COC (Domestic Circuits)
	<b>4.6</b>	<b>4.6</b>	Erection Check Sheet
	<b>4.7</b>	<b>4.7</b>	Other Safety Valves, Ventilation, Boiler Statutory Tests, Transformer Impact Recording, Boiler Registration Certificate, Type Test Certificates)
	<b>4.8</b>	<b>4.8</b>	Synchronisation Tests
	<b>4.9</b>	<b>4.9</b>	Grid Code Compliance Certificate
	<b>4.10</b>	<b>4.10</b>	Defect List
<b>Safety Requirements</b>	<b>5.1</b>	<b>5.1</b>	Safety Signs, Labels and Colour Coding
	<b>5.2</b>	<b>5.2</b>	Demarcation of Hazardous Area (Certificate & Reports)
	<b>5.3</b>	<b>5.3</b>	Lighting

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Dossier Chapter	Dossier Sub-Chapter	Dossier Sub-Sub Chapter	Documents for Final Handover
	5.4	5.4	Safety and Housekeeping Certificate
Guarantees & Warrantees	6.1	6.1	Related Extract from Scope of works Information Indicating Plant area / Component
	6.2	6.2	Certificate from Supplier indicating validity of the guarantee / Warrantees Period
		7	Special Tool List
		8	Insurance Cover (90 Days Notification Period)
Plant out of Normal Status Approved	9.1	9.1	Approved Out of Normal Status
	9.2	9.2	Out of Normal Status (Pending Approval)
Training	Competency Declarations	10.1	Training Manual
		10.2	Proof of Training
		10.3.1	Plant Safety Regulations
		10.3.2	High Voltage (HV) Regulations
		10.3.3	PFFR

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Dossier Chapter	Dossier Sub-Chapter	Dossier Sub-Sub Chapter	Documents for Final Handover
		<b>10.3.4</b>	Other
Provisional Handover Certificate	11.1	11.1	Provisional
	11.2	11.2	Pending Approval
	11.3	11.3	Approved
Final Handover	12.1	12.1	Provisional
	12.2	12.2	Pending Approval
	12.3	12.3	Approved
Other	13.1	13.1	Factory Acceptance Tests • Signed Protocol Release Report
	13.2	13.2	Shipment and Transportation - • Transportation test results • Transportation PQP
	13.3	13.3	Other Documentation and Reports • Design assumptions • Trade-offs
	13.4	13.4	Design Software • Software listing • CAD software data files
	15.5	15.5	Correspondences • Engineering Instructions (EI's)

**Note:** The *Contractor* is to liaise with the *Employer* on any items deemed N/A on the above list, this is to be agreed with the *Employer* prior to submittal.

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