



Scope of Works

Technology

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1. INTRODUCTION

Medupi Power Station is a coal fire power station and a National Key Point situated near Lephalale in Limpopo Province. The Medupi Ash Dump Workshop has experienced inadequate drainage with water ponding near the facility that has compromised access to the workshop. Generation has raised a concern regarding the current suitability of the drainage in the area and requested remedial measures be undertaken to correct the ponding water.

The Employer, Eskom SOC, had previously entered into a professional engineering services contract for the design, construction monitoring, professional certification, technical assurance of construction works, and provision of end of construction documentation i.e. as built documentation and Professional Engineering Certificates (PEC's) for the Medupi Ash Dump Workshop, stormwater drainage, access and terracing. The professional engineering services contract between the Employer and the originally appointed designer has ended. This has left the Employer with incomplete works.

This scope aims to complete the outstanding work to allow for adequately function drainage and access to the Ash Dump Workshop and Substation.

The Employer has resolved to issue the existing designs as conceptual designs to the open market and invite all interested parties to provide professional design and construction services for the works.

All Registered Professionals shall execute their services in accordance with the ECSA Code of Conduct

Contractor's Designer shall (not limited to):

- a. The Contractor shall use the Employers Design in the form of construction drawings as a basis/departure for their detailed design. The detailed design was completed by original consultant around 2014 and as such the contractor shall make provision for review and/or modification and/or adopt (as applicable) to the extent necessary to assume professional design liability for the existing designs. Any changes to the Employers design must be motivated to The Employer. Design liability shall be with the Contractor (design consultant).
- b. The Contractor is responsible for progression the existing design information presented in the "Employer's Design Drawings" section of this document into a fully integrated detailed design. The existing designs interface with existing infrastructure and operation and as such the contractor shall consider as far as reasonably practicable the prevailing site constraints and conditions.
- c. The Contractor's design consultant shall be liable, fully accountable and assume the role of designer as defined in Construction Regulations for the design and the constructability of the design submitted to the Employer.

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- d. Provide design assurance and design verification on existing designs and make the necessary amendments.
- e. Attend meetings with the Employer's Engineering team
- f. Provide construction monitoring services of the works including but not limited to the points below:
- g. Carry out sufficient inspections at appropriate times of the construction work in order to ensure compliance with their design, to ensure design assumptions are valid and that work being executed in accordance with appropriate construction techniques.
- h. Assist the Employer with design and construction integration issues pertaining to the scope of works
- i. Provide technical assurance during project life cycle including but not limited to review and approval of construction quality assurance and control documentation
- j. Final site inspection on completion of the works prior to issuing a completion certificate.
- k. Review and acceptance of construction data books
- l. Provide as built documentation including but not limited to drawings for various structures
- m. Issue Professional Engineering Certificates, by an ECSA registered Engineer or Technologist with relevant experience and qualifications in their specific fields of expertise.
- n. The Contractor shall adhere to all applicable Normative and Informative documents as per Section 2.2 of this document including other relevant applicable documents.

Contractor's Construction team shall:

- a. Construct the work (procure, supply, install and commission), as per the approved construction drawings, applicable specifications and the latest addition of the Construction Regulations
- b. Provide material required to complete the works
- c. Remove superfluous material from the works
- d. Perform all specified quality assurance and quality control tests and submits to the Engineer for acceptance
- e. Provide all plant and other tools to complete the works
- f. Provide data book records as required in this SOW

2. SUPPORTING CLAUSES

2.1 SCOPE

This document covers the scope of work for a design and construction contract. The contractor is to perform professional engineering services for the design and construction monitoring of the works to ensure design intent (in principle ensure the construction is as per design and the design achieves the goal of: alleviating flooding in this area, free draining the area and tying into appropriate existing services) is achieved, design

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verification and development of construction completion reports, assessing design changes, issuing of Professional Engineering Certificates and construction of the works.

Purpose

The purpose of this document is to define the scope of *Works* required for the design and construction of the Drainage, Access and Terracing at the Ash Dump Workshop, Substation and Surrounds at Medupi Power Station.

Applicability

This document is applicable to Medupi Power Station.

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2.2 NORMATIVE/INFORMATIVE REFERENCES

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

Normative

- [1] Occupational Health and Safety Act (Act 85 of 1993)
- [2] National Building Regulations And Building Standards Act No. 103 Of 1977
- [3] SANS 10400 - All Parts--National Building regulations
- [4] 240-53113685 - Design Review Procedure
- [5] 240-56356376 – Site commissioning for low pressure services
- [6] 200-1689 - Medupi Quality Specifications
- [7] 200-129834 - Storage and Preservation
- [8] 200-4190 - The application of KKS plant coding (NMP 45-7)
- [9] 200-94660 - KKS Plant Codification Standard
- [10] 200-18202 - KKS Key Part – Fossil power station (NPSZ 45-45)
- [11] 200-5343 - Employer's abbreviation standard
- [12] 200-3340 - Medupi Label specification.
- [13] VGB – B 106 E Part A– KKS Application Commentaries Part A – General
- [14] VGB – B 106 E Part B2 – KKS Application Commentaries Part B2 - Civil Engineering
- [15] 240-76992014 - Technical Document and Record Management Work Instruction
- [16] 240-86973501 - Engineering Drawing Standards – Common Requirements
- [17] 240-87412151 - Instruction for archiving hard copy records with the Eskom Archives
- [18] 200-616427 - Data Book checklist
- [19] 200-3583 - Specification for the Identification of the Contents of Pipelines and Vessels
- [20] 200-6166 - Medupi Power Station Backfill Specification
- [21] 348-880042 Medupi Concrete specification for structural concrete (84CIVL053)
- [22] SANS 2001 - Construction works (complete series)
- [23] SANS 1200 - Standardized specification for civil engineering construction (complete series)

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- [24] SANS 824 - Lime for soil stabilization
- [25] 240-57127955 - Geotechnical and Foundation Engineering Standard
- [26] 240-56364545 Structural Design and Engineering Standard
- [27] 200-26680 Power Station Architectural Technical Specifications for Structures and other Buildings
- [28] 200-24289 Medupi Power Station Corrosion Protection Specification
- [29] Medupi Excavation Permit
- [30] Relevant and applicable regulations

Informative

- [1] ISO 9001 Quality Management Systems
- [2] ISO 10007 Guidelines for Configuration Management
- [3] Occupational Health and Safety Management Systems Requirements (OHSAS 18001)
- [4] 240-82410629 – Environmental Management Strategy
- [5] 240-60490979 – OHS Operational Plan
- [6] 200-53810 - Documentation Handover List
- [7] 348 – 106670 - Site Quality Assurance, Control and Verification Works Instruction
- [8] 200-38425 - Procedure for Hazard Identification and Risk Assessment
- [9] 200-16817 - Excavation Permit Application Procedure
- [10] 200-15406 - Issue Takeover Certificate
- [11] 200-11303 - Medupi Occupational Health, Safety and Management Policy
- [12] 200-1680 - Document and Record Management Procedure
- [13] 200-1679 - Project Quality Plan
- [14] 32-421 - Eskom Life Saving Rules
- [15] 32-245 - Eskom Waste Management Standard
- [16] 200 16714 - Medupi Commissioning procedure
- [17] 348 - 860842 - Manufacturing Inspection and Testing Work Instruction
- [18] SANS 3001-C03-1 Part CO3-1: Concrete durability index testing — Preparation of test specimens
- [19] SANS 3001-C03-2 Part CO3-2: Concrete durability index testing — Oxygen permeability test

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- [20] SANS 3001-C3-3 Part CO3-3: Concrete durability index testing — Chloride conductivity test
- [21] SANS 10102 – 1 - The selection of pipes for buried pipelines Part 1: General provisions
- [22] SANS 10102 – 2 - The selection of pipes for buried pipelines Part 2: Rigid pipes
- [23] 240-84418186 Road Specification Manual
- [24] 240-85549846 Standard for Design of Drainage and Sewerage Infrastructure
- [25] SANS 207 The design & construction of reinforced soils & fills
- [26] TRH17 Geometric Design of Rural Roads
- [27] SANRAL Geometric Design Guidelines
- [28] SA Road Traffic Sign Manual
- [29] The South African National Roads Agency Limited, Drainage Manual
- [30] TRH 16 Traffic loading of Pavement and Rehabilitation Design
- [31] UTG 2 Structural Design of Segmental Block Pavements
- [32] TRH20 The structural Design, Construction and Maintenance of Unpaved Roads
- [33] South African Pavement Engineering Manual (SAPEM)
- [34] PWI 200 – 5664: Engineering Change Management Work Instruction.

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2.3 DEFINITIONS

Definition	Description
Detail Design	Process to develop and issue Approved for Construction documents and drawings in accordance with the Design Base, including Quality Control, Quality Assurance, and Change Management.
System	An integrated set of constituent pieces that are combined in an operational or support environment to accomplish a defined objective. These pieces include people, hardware, software, firmware, information, procedures, facilities, services and other support facets.
<i>Contractor's</i> Designer	A registered Professional Engineer or a registered Professional Engineering Technologist specialising in and having experience in the design of civil works or structures appointed by the Contractor
Contractor	Service provider contracted to provide a specific service to Eskom, Medupi Power Station.
Employer	Eskom, or Eskom Medupi Power Station or representative
Designer	A registered Professional Engineer or a registered Professional Engineering Technologist specialising in and having experience in the design of civil works or structures

2.4 ABBREVIATIONS

Abbreviation	Description
ITP	Inspection and Test plan
OHSA	Occupational health and Safety Act
PPE	Personal Protective Equipment
TM	Team Medupi
QA	Quality Assurance
QC	Quality Control
QCP	Quality Control Plan
QMS	Quality Management System

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Abbreviation	Description
SABS	South African Bureau of Standards
SANS	South African National Standards
SHE	Safety Health and Environmental
SOW	Scope of Work
CAR	Corrective Action Request
PBS	Plant Breakdown Structure
OHSA	Occupational health and Safety Act
KKS	Kraftwerk-Kennzeichensystem
TOC	Take Over Certificate

2.5 ROLES AND RESPONSIBILITIES

Broadly, The following roles and responsibilities apply:

Person	Responsibility
Contractor	The <i>Contractor</i> shall design (to the extent specified in the Contract), execute and complete the Works in accordance with the Contract and with the Engineer's instructions, and shall remedy any defects in the Works.
Engineering Design Work Lead (EDWL)	He/she co-ordinates the design work provided by the discipline Design Engineering roles and integrates this work into a final integrated design product. He/she is the custodian of the requirements set and the interface register between packages and part of his/her role is to maintain this information. He remains responsible for the integrity of the engineering product and is accountable for the overall management of interfaces and delivery of an integrated product.
Lead Discipline Engineer (LDE)	The role of the Lead Discipline Engineering role is to manage the technical integrity of the design and be accountable for the management of the interfaces within their specific engineering domain
Site Construction Engineering Practitioner	The Site Construction Engineering role is part of the project engineering team and participates in

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	<p>conjunction with other team members of all disciplines in order to assure the technical integrity of a fully functional and operational plant that meets the user requirement and Eskom Engineering expectations and requirements. The Site Construction Engineering role is a key link to facilitate and ensure that the plant, is built and commissioned, is fully aligned with the Design Base, Operating Technical Specifications and the Maintenance Base. The role provides an assurance function.</p> <p>Quality inspections, Final acceptance, sign-off and approval</p>
Designer	<p><i>As per Construction regulations: Designer means</i></p> <ul style="list-style-type: none"> a) a competent person who i) prepares a design ii) checks and approves a design iii) arranges for a person at work under his or her control to prepare a design, including an employee of that person where he or she is the employer; or b) engineer contributing to or having overall responsibility for a design; c) a contractor carrying out design work as part of a design and building project;
Architect	<p>“The architect is responsible for the concept, layout of a building, the specification of finishes, the submission and approval of architectural plans, ensuring compliance with planning requirements and national building regulations and similar activities.”</p> <p><i>From ECSA The role, responsibilities and conduct of persons registered with ECSA appointed for small building works</i></p>
Project manager/Contracts manager	<p>The Project manager coordinates the execution of the Works to achieve the required cost, schedule and quality objectives. The Project manager is delegated authority from the Eskom Employer Representative to manage the defined scope of work..</p>
Engineer	<p>The <i>Engineer</i> is Eskom’s representative(s) that officially communicates with the <i>Contractor</i> through the Contracts manager. The <i>Engineer</i> relays all technical information in the form of the processes prescribed in the Engineering Change management procedure as well as on site</p>

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	interaction and meetings to facilitate the resolution of all queries of a technical nature.
Quality Management	Quality ensures Contractors build plant according to contractual specifications, and user requirements and codes. Quality is the custodian of the Quality Management System and quality records, and facilitates the work of the Approved Inspection Authority (AIA). The Quality Function's responsibility is to ensure Contractors have a sound quality system in place. Quality checks these systems on behalf of the Employer.

2.6 PROCESS FOR MONITORING

As per the design review procedure (240-53113685)

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3. REQUIREMENTS

3.1 SAFETY REQUIREMENTS

The *Contractor* shall ensure:

- a. Compliance with all requirements of the Occupational Health and Safety Act no 85 of 1993 and its regulations so as to ensure the health and safety of persons carrying out the *Works*.
- b. All employees are medically, physical and psychologically fit to perform the *Works*.
- c. All employees undergo the relevant training as per their function requirement
- d. Compliance with Eskom's SHE policy, procedures, standards, guidelines, specifications and site regulations. Employees shall have a valid medical certificate of fitness specific to the work to be performed
- e. Employees are informed of hazards identified in the risk assessment before commencement of *Works*. The Method Statement shall also be communicated to the employees on this work activity before commencement of *Works*.
- f. The emergency rescue plan shall also be communicated to personnel undertaking the *Works*
- g. All safety and health related incidents around site or working areas and threats that pose a danger to one's life or health are immediately reported
- h. Sufficient health and safety information as well as resources are made available
- i. All employees undergo safety induction on-site
- j. All power tools will be inspected as and when required.
- k. Prescribed PPE for the specified Works shall be worn at all times. The provision of PPE shall be the responsibility of the Contractor.
- l. Correct site drawings are obtained and communicated to the employees undertaking the Works

3.2 FUNCTIONAL REQUIREMENTS

The *Contractor* shall ensure the stormwater drainage around the Ash Dump Workshop and Ash Dump Substation is functional without any ponding water for the remained of Medupi Power Station Design Service Life of 50 years.

3.3 GENERAL REQUIREMENTS

1. The *Contractor* is responsible for the design, construction, construction monitoring, supply, installation, testing, commissioning and certification of all items according to the applicable codes, standards and requirements set out within this document.

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2. Where this document is not clear regarding the location of an item to be installed or work to be performed, it is the *Contractor's* responsibility to determine the correct location from the Employer's engineering representatives. The *Contractor* will only act upon confirmation by receipt of an Engineering Instruction via the Project Manager. Incorrectly positioned items, or incorrect work done (where Engineering Instructions were not issued) will be moved / removed / replaced / changed / reinstalled by the *Contractor* at his cost
3. All referenced Eskom standards will be made available to the *Contractor*.
4. The *Contractor* shall label the plant according to Medupi Power Station Plant coding which is KKS Plant Codification Standard – 200-94660.
5. Each drawing, diagram and list will refer to the area of plant by means of the plant labelling in accordance to Eskom drawing standard.

3.4 MATERIAL REQUIREMENTS

The *Contractor* shall be responsible for the supply of all materials. There is the potential of free issue, if any, material that will be verified with the Employer after Contract award.

Where a material is specified in this document, the material supplied shall be exactly in accordance with the specification. If the *Contractor* intends to use similar or equivalent materials the *Contractor* shall apply in writing to the Project Manager for approval thereof.

3.5 ENVIRONMENTAL REQUIREMENTS

The *Contractor* shall ensure:

- a. Appropriate measures shall be undertaken to minimise the generation of dust from work activities
- b. All environmental incidents are reported as guided by 32-95
- c. The work area is kept clean, tidy and free of waster/rubbish. Waste shall be disposed of in designated bins
- d. Adherence to Water Use License (WUL 27086983) and Regulation 704 of the National Water Act (Act 36 of 1998).
- e. Plant and machinery shall be equipped with drip trays. Oil refills for plant and machinery shall take place in designated areas

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3.6 QUALITY REQUIREMENTS

3.6.1 Quality Management System

The Contractor shall be certified or demonstrate compliance to the latest version of the ISO 9001 Quality Management Systems standard.

- a. The Contractor shall provide Index, Method statement, Inspection and Test Plan (ITP) or quality control plan (QCP) for the Works to the employers team for review and approval before carrying out any works
- b. All documents shall be accepted by the Employers Team prior to any commencement of any works(Permanent or Temporary)
- c. All quality procedures and verification points as per the project quality requirements or specifications shall be adhered to
- d. All quality documents and records applicable to this Scope of Works shall be submitted for record keeping

The Contractor shall implement the requirements of the latest revision of the Medupi Quality Specification, and have the following documented information as a minimum:

- Quality Policy
- Project Quality Plan
- Operational procedures and work instructions (e.g. inspection and test plans, method statements, control of nonconformity, corrective action, risk management, etc.)

3.6.2 Inspection

Inspection activities during manufacturing shall be managed according to the Medupi Manufacturing Inspection and Testing Procedure (348 - 860842).

Inspection activities during construction shall be managed according to the Medupi Site Quality Assurance Control and Verification Procedure (348 - 106670).

Where a product nonconformity is identified by the Contractor to a system, product or process, a nonconformity shall be documented and reported to the employer as detailed on Control of nonconformity product (200 - 15327)

The Contractor shall be required to maintain inspection databases where all records of inspection are maintained as required in the Medupi Quality Specification (200 – 1689).

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The Contractor shall employ sufficient qualified and knowledgeable quality assurance, quality control and inspection staff. These staff members shall be independent from those responsible for construction and commissioning activities and report directly to the Site Quality department Manager and not the production team as referenced on Medupi Quality Specification (200-1689 sub-clause 3.4.1).

The Contractor's designer shall provide services in accordance with ECSA's Guideline Scope of Services and Tariff of Fees for Persons Registered in terms of the Engineering Profession Act, 2000, (Act No. 46 of 2000) and the Construction Regulations, 2014, Occupational Health and Safety Act, 1993.

3.6.3 Data Books

The Contractor shall develop a document procedure for Engineer's approval and thereafter implement a system for collation or quality verification records, including change management records into Manufacturing, Construction and Commissioning Record Books.

The Contractor shall beforehand, Ensure that all document to be filled in a data books are reviewed and approved for use. Data book shall be reviewed progressively during 30%, 70% and 100% of the completion stage of the works.

The Contractor shall provide evidence of self-review of data book at each interval of works as defined above in the form of a comment sheet.

The contractor shall ensure that all comments from the Employers are addressed and an evidence must be produced to the Employer at the successive reviews.

No data book review request shall be conducted by the Employer without the Contractors review comment sheet reflecting that a review was done by the contractor.

The Contractor shall develop a Data book Register which shall be maintained and shared by the contractor on weekly basis with the employer, for the duration of the project.

Said Procedure shall define format, content and structure of Record books and process of compilation and handover and shall, as a minimum, conform to the following:

a) Record Books shall be provided by the Contractor for;

Manufacturing - Prepared for each individual "Purchase Order, Scope of work and employer requirements". Only manufacturing records per discipline e.g. Civil, Structural steel, Mechanical, Electrical, C&I works etc.

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Construction/Erection - Prepared for Each Discipline as in bullet 1, each geographical area for civil works and for systems/sub- systems for mechanical and electrical systems including C&I separately

Commissioning - prepared for each commissioned system.

Note: Record books shall not be combined in one file. Manufacturing, Construction/Erection and Commissioning shall be separated.

- a) The Contractor need not include documents and drawings etc. that have been approved by the Engineer which are included in SPO and shall instead provide and include an index of such documents in the Record Books on the basis that the originals are in SPO and traceable via the "Index".
- b) Record Book shall be written in English or provided with an English translation
- c) The index of all Record Books shall be submitted to Engineer for approval.
- d) As the work progresses Contractor shall compile Record Books progressively with the original material, installation, erection, testing, inspection and change management documents and shall verify continued and accurate updating via weekly review and spot checking against inspection performed that week.
- e) Contractor shall report the status of Record Book compilation progress on Weekly Progress/ Quality Meetings together with the Data book Register.
- f) Record Books shall be endorsed by stamp, date and signature of the Contractor and the Engineer signifying completion and accuracy when complete.
- g) Each Record Book shall have cover sheet (With a Sleeve pocket to insert a cover sheet) of A4 size paper and a spine label on which is printed the following:
 - i. Title of Document
 - ii. Contractor's company logo Unique number/SPO
 - iv. Name of Project
 - v. Contractors' Job Contractors' Job Code
 - vi. Contractor Document number
 - vii. Eskom Document Number
 - viii. System number
 - ix. KKS number

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- x. System Description
- xi. Document type "Manufacturing, Construction or commissioning"
- xii. Contractor number
- xiii. Name of Contractor
- xiv. Volume Numbering (1 of or 1/10)
- xv. Contractor's Address
- xvi. Column for signature by Contractor Quality and Engineer's representatives.

- h) All Construction Record books shall be Completed, Approved Safety Cleared and handed over to Eskom not later than 21 days after Final inspection (AFI) Prior Commissioning Phase.
- i) For other civil/ Earthwork, All Construction Record books shall be Complete, Approved and handed over to Eskom prior taking over section of works.
- j) All Commissioning Record books, Operating , maintenance and training manuals shall be Completed, Approved and handed over to Eskom not later than 21 days after the last test prior taking over of completed works (TOC)
- k) Construction Record Book shall be compiled in A4 size with 4-post binders in loose-leaf form with numbered pages such as, Page 1 of 10 or 1/10 whichever sequential counting method that clearly identifies page numbering.
- l) Summary table of each volume's contents shall appear in all volumes. Volumes are to be numbered e.g. 1 of 3, 2 of 3, 3 of 3 etc. both on spine and front cover.
- m) The binders are to be robust and not subject to distortion by impact during shipping. The binders shall not be over filled and contain only a suitable number of documents to enable convenient handling.
- n) Contents shall be sectionalized and separated by properly labelled dividers
- o) Contents shall be placed in the relevant sections and sections shall be separated by properly labelled section dividers / separator sheets easy referencing with going through the content.
- p) All section dividers/ separator sheets shall be made of card and shall bear the Section Identifier - 1, 2, etc.
- q) The contents of each section, e.g. Section 1, Section 2, etc., of the Record Book shall be placed directly behind the relevant section dividers / separator sheets and each document shall be clearly marked with the following:

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- i. Relevant section letter
- ii. Page number - every document shall receive a page number.
- iii. In each section the page numbers shall run consecutively.

Record Books shall contain as a minimum

- iv. All material Reports and Certificates
- v. All Inspection Reports
- vi. All Test Reports
- vii. All Release Notes
- viii. All Change Management Reports
- ix. All drawings or an index of drawings identifying drawing No. and revision status
- x. All Defect Reports
- xi. All Procedures or an Index of Procedures
- xii. All Inspection and Test Plans if used as a Quality Verification Record or an Index of Inspection and Test Plans if used as an assurance and control document
- xiii. All Drawings or an Index of Drawings

The Contractor shall develop and implement a system for collation or quality verification records, including change management records, into Manufacturing, Construction and Commissioning Record Books (Data Books) as specified in the Medupi Quality Specification

Data Books shall be maintained by the Contractor to substantiate conformance to product specifications and requirements. All records shall be safely stored (easily retrievable) following the final completion of the works. These records shall include as a minimum:

- Quality Management documentation as specified in the Medupi Quality Specification
- Safety clearances (to be granted prior commissioning)
- Construction, layout and component approvals
- Routine test certificates
- Construction and as-built drawings and approvals
- Data Books (Record Books)

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3.6.4 Storage and Preservation

The Contractor shall implement storage and preservation requirements in accordance with the Storage and Preservation Procedure where applicable (200-129834).

3.7 DRAWING REQUIREMENTS

The creation and control of all Engineering Drawings shall be in accordance with the latest revision of 240-86973501 (Engineering Drawing Standards – Common Requirements).

The *Contractor* shall provide detailed arrangement/dimensional Construction drawings for each part of work to be done. No work will commence without approval of these drawings approved by the *Engineer*. Revised or Redlined drawings similarly must be approved by the Engineer.

After the works have been completed, detailed “As-built” drawings shall be provided by the *Contractor*. The “As-built” drawings are subject to the *Engineer’s* comments and approval.

All drawings shall indicate any new/modified sections. This shall be done in sufficient detail to easily identify the location and detail.

All drawings shall contain the following as a minimum:

1. Description of component with KKS number.
2. Layout of the drainage network with dimensions and angles.
3. Bill of materials (BOM) for all components traceable to the layout. BOM should include size, schedule, pressure rating or class, material, quantity etc.
4. Design and operating drainage flow (if applicable)
5. Design Code.
6. All Drawings to be supplied in native design authoring tool format. as well as .PDF format.
7. Name, ECSA registration number, and signature of responsible ECSA registered professional

All required drawings shall be prepared in accordance with the requirements as specified in the Engineering Drawing Office and Engineering Drawing Standard (240-86973501). A drawing register (Master Document List, with document revision and status) which records the drawing's information shall be maintained and submitted to the Employer on a weekly basis. Drawings to be prepared will include but not be limited to:

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- Equipment drawings;
- Equipment lists;
- Isometric drawings and P&ID's;
- Original Equipment Manufacture OEM manuals and part catalogues;
- Set point and parameter lists;
- Three dimensional drawings requirements- DGN model
- General Arrangement Drawings
- Workshop drawings

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3.8 CONFIGURATION MANAGEMENT REQUIREMENTS

Configuration Management Plan

The *Contractor* shall prepare a configuration management (CM) plan utilizing ISO 10007 as a reference guide for the scope of work. The CM plan shall include the following:

- A complete and comprehensive description of the *Contractor's* document numbering conventions and revision schema;
- A description of the electronic data management system(s) that the *Contractor* will use for the management of documents and/or configuration items;
- A description of the configuration management activities which will be undertaken by the *Contractor* as well as a rough time-scale thereof;
- A description of the baselines that will be established and the content of these baselines;
- The release procedure for product configuration information;
- The procedure for the control of changes prior to the establishment of baselines as well as after;
- The method for processing changes, emanating both internally and from sub-suppliers;
- The method for collecting, recording, processing and maintaining the data necessary for producing configuration status accounting records;
- The definition of the content and format for all configuration status accounting reports;
- A list of audits which will be conducted to ensure adherence to the CM plan.

Plant Designation

Plant Designation System

The *Contractor* shall apply the Kraftwerk-Kennzeichensystem (KKS) codification system to uniquely identify the systems, sub-systems and components constituting the Plant.

The *Contractor* shall identify all plant indicated or referenced by documentation by the plant's unique KKS codes within the documentation itself.

The *Contractor* shall ensure that the codification assigned to plant is consistently maintained throughout the design cycle, e.g. the KKS codes indicated in the O&M manuals are consistent with the KKS codes indicated in the original process and instrumentation diagram.

The Employer shall supply the *Contractor* with a system-level plant breakdown structure (PBS) of the existing plant at the Site, as well as a preliminary system-level plant breakdown structure of the plant within the *Contractor's* scope at contract initiation. The *Contractor* shall review the PBS to ensure alignment with

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the *Contractor's* design philosophy, and shall expand the PBS to the complete system level (Fn level of the KKS hierarchy). The *Contractor* shall provide a complete system-level PBS with the submission of the process flow diagrams of the plant within the *Contractor's* scope.

The *Contractor* shall codify all equipment, and any components which are required to be codified as per the guidelines and standards referenced in this document. The *Contractor* shall indicate equipment and component codification in drawings and documents indicating or referencing such plant.

The *Contractor* will submit all KKS codes designated by the *Contractor*, with the documents in which they were originally designated, to the Employer for review. The *Contractor* will remain responsible for ensuring that the codes designated are unique and meet the requirements established by the various standards applicable to the Project. Where any ambiguities or doubts with regards to KKS codification exist, the *Contractor* will engage the Employer for resolution.

Plant Labelling

The *Contractor* shall manufacture and install labels according to the Medupi Label specification.

Any abbreviations to plant descriptions shall be prepared in accordance to the Employer's Abbreviation Standard.

Detailed nameplate or label lists with the service legends and including the KKS Code shall be prepared by the *Contractor* and submitted to the Employer for review and comment before commencing the manufacture of the labels. On plant areas where labels do not make ergonomically sense please consult site configuration management for guidance.

Plant Designation Within Documentation

The *Contractor* shall prepare a list of KKS designations allocated to components for each scope of delivery or system (this list will be referred to as equipment list in the rest of this document for simplicity's sake, but includes documents such as cable schedules, valve schedules, etc.). The equipment list shall be submitted with the original implementation documentation describing the design of the system (e.g. process and instrumentation diagram, single line diagram, etc.). The *Contractor* shall ensure that the equipment list accurately represents the implementation documentation which it accompanies. The content of the lists will be agreed to per discipline with the Employer. As a minimum, the equipment list shall include:

- The KKS designation of all components within the relevant scope or system;
- The full verbal description of each component, compiled according to the standards referenced in this document;

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- The abbreviated description of the each component, utilising abbreviations as listed in the referenced project abbreviation list, and abbreviated to a number of characters as required by the project digital control system (DCS) and as per the label requirements;
- The approval status of each component, in alignment with the list of approval statuses specified for document.

Document Submission

All documents shall be submitted to the Eskom Documentation Centre. The language of all documentation is required to be in English. The *Contractor* shall submit the Vendor Document Submission Schedule (VDSS) as per agreed dates to the Eskom Documentation Centre and to the Project Manager. Eskom shall pre-allocate document numbers on the VDSS and send back to the *Contractor*. The VDSS is revisable and changes shall be discussed and agreed upon by all parties and properly documented. Changes in the VDSS include: additional documentation to be submitted; changes in submission dates; corrections in documentation descriptions and document numbers; etc. The Vendor Document Submission Schedule (VDSS) shall indicate the format of documents to be submitted. Eskom shall be responsible for the management of the schedule i.e. to create a document register that shall be used to track submission progress of documentation by the *Contractor* as per the committed dates on the VDSS.

Transmittal

The *Contractor* shall list all project documents (soft copies and hard copies) for submittal on the transmittal with the following metadata fields:

- Title of the document
- Document Unique Identification number
- Revision number
- Name of Discipline
- Reason for issuing/submission
- Sender's detail
- Sent date
- Recipient's Details
- Date received
- Quantity of documentation referenced on the transmittal
- Number of copies
- Format/medium submitted (eg: paper, DVD, etc)
- Sender signature

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- Recipient signature, once submitted, to acknowledge receipt

Email Subject

The email subject shall as a minimum have the following:

(Project Name_Discipline_Subject)

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

- Electronic copies shall be submitted to Eskom Documentation Centre through a pre-defined email address. Electronic copies too large for email shall be delivered on CD/DVD, 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 shall be copied on the email as well.
- Hard copies shall be submitted to the Eskom Representative accompanied by the Transmittal Note.
- The format of the final documentation handover shall be specified in the Vendor Document Submittal Schedule.

Documentation requirements

All documents supplied by the *Contractor* shall be subject to Eskom's approval. Documents such as QCP's, Method Statements and other documents impacting the work shall be approved by the *Employer* at least 3 working days prior to commencement of the Works.

Each revision of a document or drawing shall be accompanied with a list of the comments made by the *Employer* on the previous revision if applicable and the response/corrective action taken by the *Contractor*. Changes shall be recorded in a revision table contained on/in each drawing/document.

Documents and drawings shall indicate the *Employer's* drawing 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 or drawings, the *Employer's* number shall be used.

The *Contractor* shall compile a complete data book for all work done during manufacturing, construction and commission containing the following as a minimum if applicable:

1. Scope of work
2. Approved "As built" drawings
3. Design calculations
4. Approved QCP / ITP

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5. Inspection reports
6. As built drawings (isometric drawings and P&IDs)
7. Material summary that gives full traceability between components used, drawings and material certificates
8. All material certificates for pipes, fittings and all components used.
9. Pressure test certificate and the calibration certificates of the gauges used.
10. Pressure test procedures
11. All CAR's and corrective actions
12. Operating Philosophy including all alarm and trip values
13. Parts catalogue
14. Maintenance manual
15. Storage, packing and transportation instructions
16. MDL

Documentation Layout Requirements

For consistency it is important that all documents used within the project follow the same layout, style and formatting standard therefore the *Contractor* shall ensure that the Technical Document and Record Management Work Instruction is used for any documentation requirements.

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General Requirement

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

The project name shall be listed on all drawings, including 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 *Designer* retains project design calculations and information as per ECSA requirements and provides these to the *Employer* on prior written notice at any time notwithstanding the expiry or termination of the contract.

Engineering Change Management

All Design change management shall be performed in accordance to the latest revision of the [1] 240-53114026 Project Engineering Change Management Procedure and the *Employer* shall ensure that *Contractor* is provided with latest revisions of this procedure. Any uncertainty regarding this procedure shall be clarified with the *Employer* and clarification updates should be reflected in updated versions of this procedure.

3.9 CONSTRUCTION REQUIREMENTS

The *Contractor* shall ensure the following including but not limited to:

- a. Personnel to conduct the *Works* are competent and shall have received the necessary training to carry out the *Works*.
- b. Resources and tools required by personnel for executing *Works* are provided.
- c. Employees are supervised. Full responsibility and accountability shall be taken to ensure that all employees are competent and aware of all requirements needed to execute *Works* safely
- d. Inspections are performed during *Works* and upon completion of *Works*
- e. Quality assurance and control is performed on *Works*
- f. Before commencement of any *Works*, a risk assessment is performed to identify all risks and hazards to which persons may be exposed to.
- g. All works shall be performed in accordance with the Construction Regulations and all other applicable regulations, standards and specifications.

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3.10 HAND OVER REQUIREMENTS

- The *Contractor* will provide sufficient documentation at Handover of areas to the Employer for safe and sustainable maintenance and operation. This will include but not limited to:
 - Statutory documentation (PEC, COC)
 - Operating and Maintenance Manuals (in signed pdf and MS Word format)
 - Spares lists (where applicable)
 - Safety Clearance Certificates
 - KKS certificates (where applicable)
 - Data books (define at kick-off how many will be detailed , Input to VDSS)
 - As built documentation including as-built drawings (pdf and native file format)
 - Native/CAD design files
 - Calculation reports signed by the Contractor's Designer (i.e. registered professional engineer).
 - QA Completeness review
 - After addressing all comments given during QC 100% review of data books, the *Contractor* shall request QA to perform completeness review of the record data books,
 - The *Contractor* shall request QA to perform completeness review of the record books /Data books prior handing over to the Employer.
 - QA will also make reference to the "Data book checklist" for compliance of format and lay out of the Record Book / Data Book

3.11 SKILLS TRANSFER

Eskom require technical skills transfer associated to the required scope of serves to designated Eskom employee (s). Skills transfer shall be reported on the monthly progress reporting with reference to minimum key mutually agreed key deliverable. The key deliverables include but not limited to knowledge and application of applicable regulatory requirements, technical design, technical drawings, technical literature and design standards, design specification, methods, software and construction methods and selection of material or as deemed appropriate and agreed to with Eskom.

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The incumbents(s) shall be supervised and/or managed by a professional engineer registered with Engineering Council of South Africa (ECSA), who shall accordingly signoff the incumbents (s) experiential and training reports as required by the Engineering Council of South Africa.

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4. DESCRIPTION OF WORKS/ WORKS INFORMATION

4.1 SYSTEM OVERVIEW

The Medupi Ash Dump Workshop and Ash Dump Substation has experienced inadequate drainage with water ponding near the facility that has compromised access to the workshop. A comparison reveals that none of the drainage, road construction or shaping activities specified in 0.84/7252 sheet 12 Rev03 have been implemented and therefore no drainage of this area has been catered for.

PEC 348-9912973 indicates that the Ash Dump Workshop is complete, however, it excludes drawing 0.84/7252 sheet 12 Rev03, a disconnect between the As-builds, PEC and status quo of site conditions.

It is unclear why these activities were never executed and why where are signed off an As-Built on incomplete works. Generation has requested remedial measures be undertaken to correct the ponding water. The images below reflect the location and extent of the flooding during the rainy season.



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Image 1: Flooding at Ash Dump Workshop

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Figure 2: Inadequate Access Due to Flooding

4.2 SCOPE OF WORKS

Boundaries: Ash Dump Workshop/Substation Surrounds

The area of concern around the Ash Dump Workshop and Substation has the following boundaries:

1. Access road and Channel to the South of Ash Dump Workshop
2. Drainage Channel and Shaping to the West of the Ash Dump Workshop and Ash Dump Substation and tie-in to existing road.
3. Drainage Channel and Shaping to the North of the Ash Dump Substation to tie-in into existing lined channel
4. All terracing and shaping between the Ash Dump Substation and Ash Dump Workshop to enable drainage storm water drainage.
5. New channels along the existing road East of the Ash Dump Workshop/Substation

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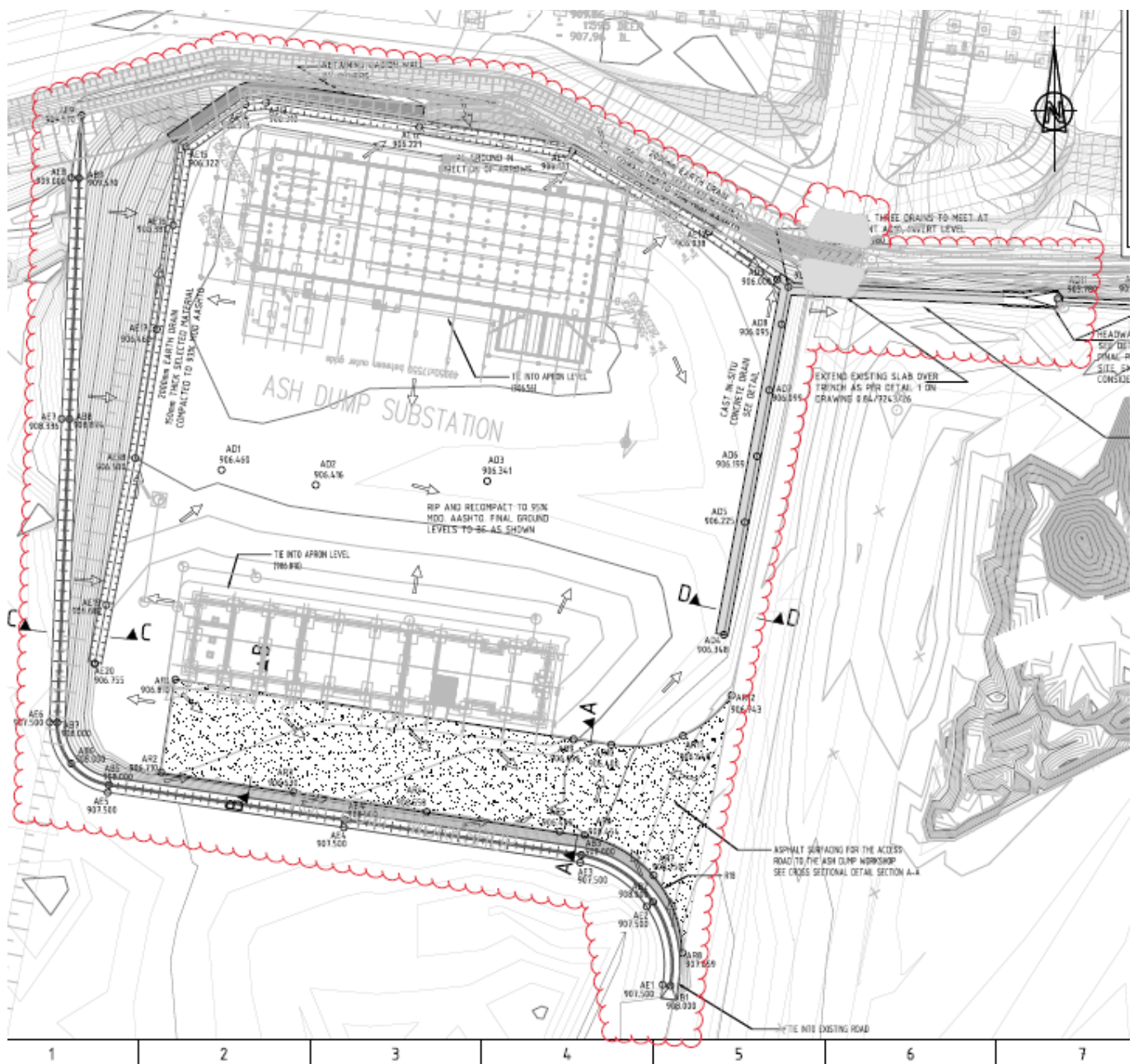


Figure 3: Indication of Work Boundaries

4.2.1 Details of Work

1. The Contractor shall use the Employers Design as a basis/departure for their detailed design. Caveat: It must be noted that the design was completed and issued for construction by original consultant around 2013 (confirm date on drawing) and as such the contractor's designer shall make provision for review and verification and/or modification and/or adopt (as deemed applicable) to the extent necessary to assume professional design liability for the existing designs. Any changes to

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the Employers design must be motivated to the Employer. Design liability shall be with the Contractor. An as-built drawing is referenced 'Medupi Power Station Ash Dump Access Roads and Drainage Layout 0.84/7252 sheet 12' Rev 03 and represents the departure point for the design.

Note: although labelled as an 'As-Built' this is not the current status on site and was never constructed. Any changes to this must be motivated and accepted by the Employer.

2. The Contractor is responsible for progression the existing design information presented in the "Employer's Design Drawings" section of this document into a fully integrated detailed design.
3. The Contractor shall be liable, fully accountable and assume the role of designer as defined in Construction Regulations for the design and the constructability of the design submitted to the Employer.
4. The *Contractor* shall provide Professional Services as Designer in accordance to, Construction Regulations, Water Use License (WUL 27086983) and Regulation 704 of the National Water Act (Act 36 of 1998) and Occupational Health and Safety Act, 1993 for the construction monitoring on the works in accordance to the provision of normal and additional services as per "Guideline Scope of Services and Tariff of Fees for Persons Registered in terms of the Engineering Profession Act 2000", for construction monitoring of the execution of all the works detailed below.
5. All existing structure used as part of the existing concept design shall be assessed and if required performance compliance testing and certification be carried out to substantiate the structure is fit for purpose and/or modify the structure for intended use.
6. The *Contractor* shall assess the stormwater runoff within the boundaries provided in section 4.2.1.
7. The *Contractor* shall provide a detailed landscaping design based on the assessment of stormwater runoff to ensure stormwater is directed/channelled to clean water drains or disposed of appropriately. This design will take into consideration all existing infrastructure. Upon review and acceptance by the Employer, the Contractor shall construct the approved design. Designs to eliminate all potential causes of flooding to the Ash Dump Workshop and Substation
8. The *Contractor* shall assess the existing terrace and perform compliance testing where needed. The *Contractor* shall perform inform of additional surveys (if any) to the extent necessary to verify and establish the incomplete area/s of the terrace that are to be completed and/or modified based on the "Employer's Design Drawings". The Contractor shall provide a drawing/s for review and acceptance by the Employer. Upon acceptance by the Employer, the Contractor shall construct the approved design.

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9. The Contractor shall construct the tie-ins to the existing clean water drains, access roads and surround infrastructure. The Contractor shall supply and install all relevant required materials and testing to ensure that pre-cast concrete sleeves are installed at an appropriate invert levels.
10. All storm-water runoff that enters the area described above should be catered for in the design. The current concept design does includes an asphalted access road. Alternative options to asphalt, such as a gravel wearing course, must be considered in the design in light cost saving measures.
11. The area around between and around the Ash Dump Workshop and Ash Dump Substation requires terracing/shaping. Currently the water is ponding and the contractor will have holistically implement the drainage solution and tie it into the existing clean storm water channels. The design included concrete lined channels and earth lined channels including erosion protection and deviation from this shall be motivated to the employer and cost saving alternatives are encouraged.
12. Eliminate all potential causes of flooding to the Ash Dump Workshop and Substation with recommendation from the Geotechnical Verification Investigation (section 4.5).

4.2.2 Surveying

The Contractor shall include provision for surveying during the construction works, the data books and as-builds as required.

A survey was requested of the area and a subsequent comparison to the signed As-Build drawing. The latest survey will be provided with all data will be provided. The survey results are represented below with directional arrows demonstrating the inadequate shaping to enable drainage:

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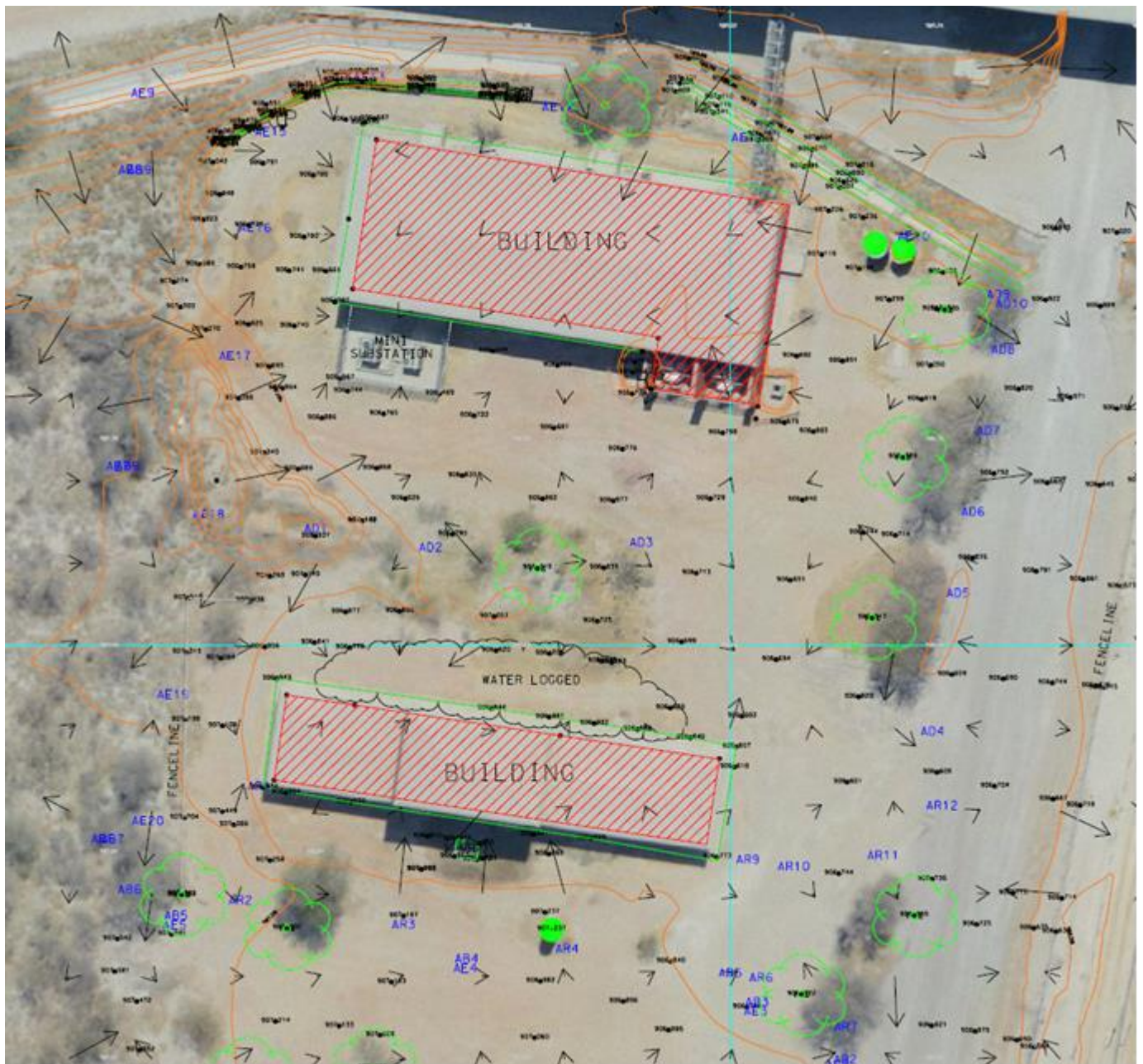


Figure 4: Current site status quo with levels and slope direction. Note missing infrastructure (drains, road, shaping)

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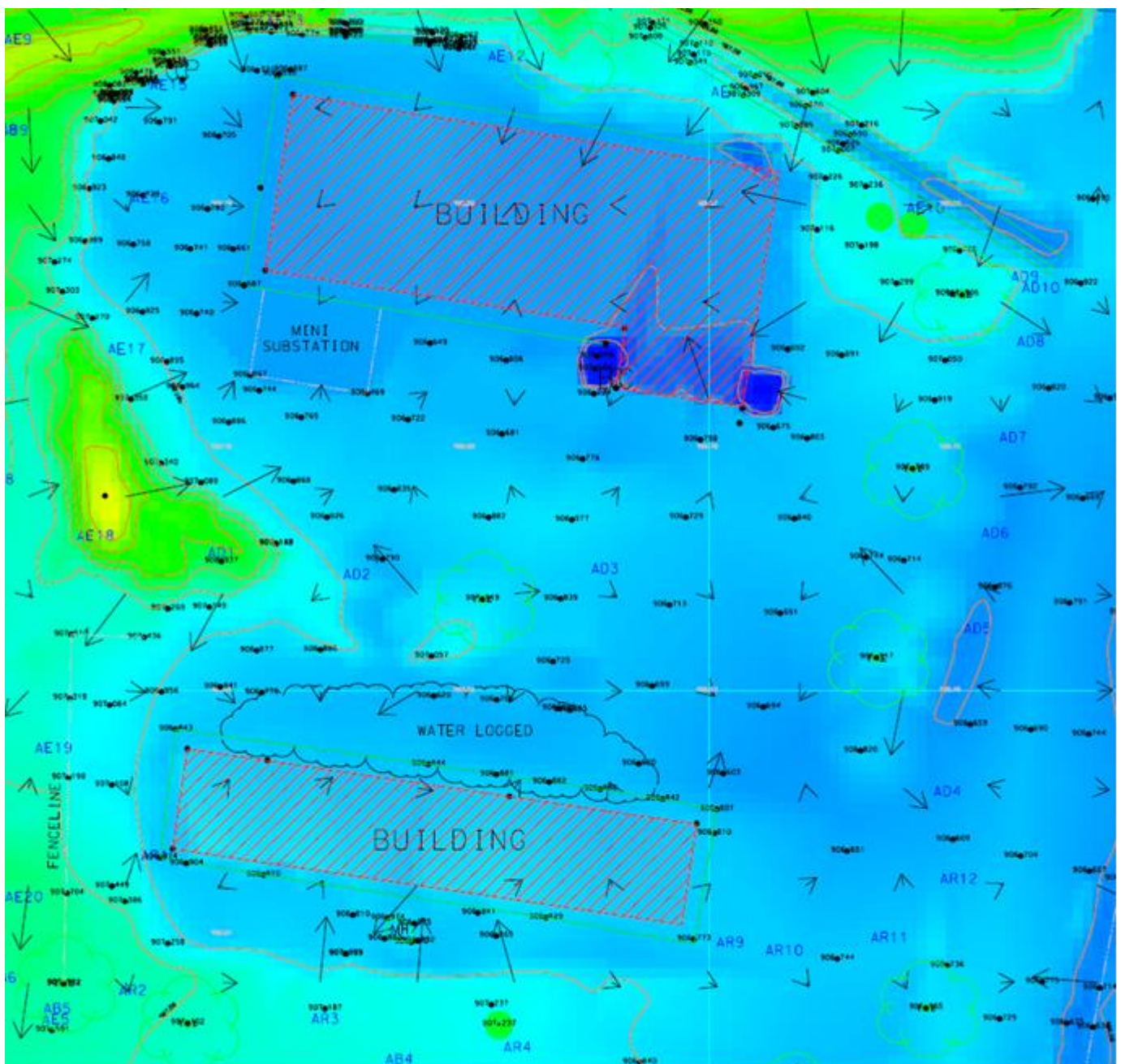


Figure 5: Demonstration of surface water logged due to non-existent shaping and drainage

Review and assumption of Professional Liability of existing designs:

- a) The professional service provider shall assume role of Designer in accordance to, Construction Regulations, Occupational Health and Safety Act, 1993, for all structures relevant to the scope.

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- b) The design and construction needs to tie in with the existing infrastructure and far as possible utilize all existing infrastructure. Changes to the existing infrastructure need to be motivated and approved by the *Employer*.
- c) Existing design documentation shall be reviewed by the Designer and changed if necessary. A review report including design calculation files shall be provided to the Employer for acceptance prior to constructions works. The contractor's designer is to perform independent surveys to enable the verification/review of the concept designs.
- d) A 1:50 year flood is to be accommodated in the designs.
- e) The Designer shall accept professional responsibility and certify all design work completed. All changes must be reviewed and accepted by the Employer.

Construction Monitoring and Professional Engineering Certification of the works

Construction monitoring includes but not limited to:

- a. Review a sample of each important work procedure and construction material and other technical submissions such as construction method statements, inspection and test plans and quality control and quality assurance plans.
- b. Attending site meetings and maintain adequate presence on the construction site to review samples of works and important completed work prior to enclosure or on completion as appropriate.
- c. Provide the construction team and the Engineer with technical interpretation of the plans and specification when required and checks the construction team's civil works and structures for conformity with design requirements and ensures that design intent is achieved during construction.
- d. Inspection of materials and equipment, as necessary, for compliance with the design documentation for adherence to National and International standards.
- e. Provides the construction team with updated design documentation (drawings and specifications) including Engineering Change documentation as per Medupi Engineering Change procedure where changes are required to ensure integration with existing works and where design changes are required due to unforeseen site conditions.
- f. Prepares and, on completion of the works, provides the *Employer* with As-Built drawings and a final (updated) design report signed by the Contractor's registered professional person.
- g. Certifies the works as complete and that design intent is achieved during construction by issuing a completion certificate (Professional Engineering Certificate (PEC)) in terms of the Construction

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Regulations, 2014, Occupational Health and Safety Act, 1993 when the works is deemed safe for commissioning.

Adverse Weather Conditions effecting Civil Works

The *Contractor* should note temperatures typically experienced in the region of Medupi Power Station. *Contractors* to consider adverse weather conditions in the construction method statement for concrete works. For clarity of the Medupi Power Station specification for structural concrete, rev 3, the *Contractor* to note the following:

When ambient temperature is above 36 °C, the temperature of the concrete when deposited shall not be allowed to exceed 32 °C and when ambient temperature is below 36 °C, the temperature of the concrete when deposited shall not be allowed to exceed 35 °C.

Exposure of concrete to aggressive environment conditions

Due to the aggressive environment that the reinforced concrete works are exposed to durability of the concrete works is of utmost importance. The design and construction of concrete works shall be done to ensure resistance to the aggressive environment the works are exposed to. The *Contractor* shall ensure that concrete placed is of good quality, dense and well-compacted. As specified in SANS 10100-1 structural concrete is designed and detailed to ensure concrete crack widths, under serviceability conditions, are limited to 0,004 times the nominal cover to the main reinforcement.

The *Contractor's* construction methods shall ensure plastic-shrinkage cracks are limited, that special precautions are taken to ensure the actual widths of cracks are within acceptable limits and that placed concrete is of good quality. The inclusion of an optimum percentage of cement extenders (Fly Ash) in the concrete mix will enhance durability of the concrete. During the concrete mix design process the *Engineer* and *Contractor* shall discuss and agree upon the use of a cement extender.

Materials and concrete testing

The *Contractor* to fully comply with the testing stipulated in (348-880042) Medupi Concrete specification (84CIVL053)[21]. The following additions and clause variations shall apply to the specifications (84CIVL053 and SANS 1200):

1. SANS 1200 L Sub-clause 3.11.3

Delete and replace with – “Except as required in 3.11.2, concrete shall comply with the requirements of SANS 1200 G, 1200 GA and the Medupi Power Station Concrete Specification 84CIVL053 Revision 3. Where the aforementioned specifications differ, the Medupi Concrete Specification shall take precedence.”

2. Eskom Medupi Structural Concrete Specification 84CIVL053 Sub-clause VA-G 3.4.1

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Delete and replace with – The *Contractor* demonstrates, by means of a report from an approved laboratory, that the aggregates do not exhibit excessive shrinkage properties in accordance with SANS 1083 and SANS 5836. The ratio of shrinkage of samples to a reference aggregate shall not exceed 175% for fine aggregates and 150% for coarse aggregates. In addition, the *Contractor* must demonstrate that the aggregates do not have a potential alkali silica reaction (ASR). In this regard, a petrographic examination, X-Ray Diffraction (XRD) tests and accelerated mortar prism tests (SANS 6245:2006) of the aggregate, and an interpretive report prepared by a recognised concrete aggregate materials specialist, shall accompany the laboratory reports. The interpretive report shall provide an assessment of the likelihood of ASR manifesting in concrete constructed with the aggregate in question, ASR severity and preventative measures to counteract ASR.

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3. Eskom Medupi Structural Concrete Specification 84CIVL053 Sub-clause VA-G 3.4.5 (c)

Delete and replace with – When tested in accordance with, SANS 6245 (Accelerated mortar prism method), all aggregates for use in the works shall have negligible alkali reactivity.

4. Eskom Medupi Structural Concrete Specification 84CIVL053 Sub-clause VA-G 3.4.6 a.)

Where not clearly indicated the *Contractor* shall discuss and agree with the *Engineer* the frequency of all testing to be conducted. All test results to be submitted to the *Engineer* for review in accordance with the contract. The *Contractor* shall submit a Quality Assurance and Quality Control plan (specifics of such plan are outlined in Section 3.5 of this document) and a concrete mix design with trial mix test results for acceptance by the *Engineer* in accordance with the contract.

4.3 CRITERIA: STORMWATER DRAINAGE AND TERRACE DESIGN AND CONSTRUCTION

The Contractor shall design and construct the stormwater drainage and terrace required to facilitate efficient drainage without any ponding of water. The design shall be based on a 1 in 50 year storm event with a minimum nominal pipe diameter (ND) of 450mm. All stormwater pipes shall be pre-cast concrete pipes with a pipe class of 100D with Spigot & Socket Joint and rubber rings. The Contractor shall ensure that his design integrates with all other services and/or buildings in the immediate vicinity. The Contractor's design shall take into account as far as reasonably practicable the existing stormwater system and infrastructure in the area. The Works shall include all relevant material required (bedding sand, pipes, selected layers etc) and construction according to an approved design as well as adhering to all relevant specifications and SANS codes including but not limited to SANS 1200.

In terms of documentation the *Contractor* will submit method statements and relevant ITPs, reviewed and accepted (signed off) by Design Engineer, for approval before commencement of any construction works. The *Contractor* will obtain an excavation permit before commencement of any type of excavation required for construction. Surveys will be submitted as per the agreed upon ITPs and provision is to be made for surveys pre, post and during construction by the Contractor to ensure compliance to all specifications and that design intent was achieved.

4.4 GEOTECHNICAL INVESTIGATION VERIFICATION

- A geotechnical investigation has been conducted across the parts of Medupi site, and the results are contained in report 348-913228.
- Before construction, a verification investigation shall be performed by the Contractor including a review of report 348-913228 furthered by any testing/samples required to satisfy the onsite conditions and geotechnical information provided to enable suitable design and accountability

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- The scope of the verification investigation shall be determined by a professionally registered geotechnical engineer or engineering geologist. The verification investigation shall not absolve the Contractor from responsibility for all geotechnical data and interpretation of all data provided.
- The verification investigation shall also determine all possible causes of the flooding experienced at the Ash Dump Substation and provide recommendation of remedial works, if any, over and above to the work in section 4.2.1.

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4.5 CONSTRUCTION CONSTRAINTS AND INTERFACES

The *Contractor* is to be aware of the following existing structures/services as seen on the Employer's Design Drawings:

- 1) Existing clean water drainage infrastructure to the North East.
- 2) Existing Building (Transfer House, Ash Dump Workshop, Ash Dump Substation)
- 3) Existing Road to the East.
- 4) Interfacing with adjacent operations including but not limited to Ash Dump facility, Sub-Station and Workshop and Stores buildings.
- 5) Existing above ground and underground services.

A construction methodology must be carefully considered for construction activities that take into account all existing infrastructure, visible and non-visible as well as that these buildings are operational. Construction activities and methods must consider keeping these buildings accessible and operational.

4.6 CODES & STANDARDS

Works shall be done in accordance with, including but not limited to, prescribed Eskom standards, applicable codes of practice, specifications and regulations. All works shall also be conducted in terms of the OHS Act, Eskom Medupi Project Specific Safety Plan and other relevant regulations.

4.7 TOLERANCES

Tolerances shall be as specified in the relevant clauses of the applicable sections of the SANS standards and specifications and Eskom Concrete specification, 84CIVL053. The *Contractor* shall ensure that tolerances are complied with.

4.8 GENERAL

- a) The *Contractor* shall carry out works as per applicable drawings, codes of practice, standards, specification and regulations.
- b) All *Works* performed by the *Contractor* will be subject to an inspection by the *Employer*

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5. DELIVERABLES

5.1 CONTRACTOR SUBMISSIONS

The *Contractor* is to provide, including but not limited to, the following for review and acceptance by the *Employer*:

- a. Design drawings (native and pdf)
- b. Design report and calculations
- c. A Construction QCP or ITPs. (Arrangements are made timeously with the Employers Engineer to witness and monitor critical elements of the works as defined in the ITP.)
- d. Execution Plan and Project Programme
- e. Construction Method Statements
- f. Material Approvals
- g. As Built Surveys to be submitted to the *Employers* Team
- h. Material Approvals for each material type. Materials selected for Works shall be pre-approved by the Employers Team
- i. Construction data book Index
- j. Construction data books accepted by Contractor's design consultant
- k. Profession Engineering certification of the completed works by ECSA registered professional
- l. Evidence of approval by Design Engineer or authorised designer representative on construction documents including but not limited to, QCP, ITPs, Material Approvals, Method Statements, Material conformance Test results and progressive survey approval.
- m. Monthly progress and inspection reports by the Design Engineer or authorised designer representative

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6. EMPLOYER'S DESIGN DRAWINGS

The listed drawing shall form part of the Employer's Documents.

Table 1: Employer's Design Drawings

Title	Employer's Drawing No.	Rev No.
MEDUPI POWER STATION ASH DUMP ACCESS ROADS AND DRAINAGE LAYOUT	0.84/7252 SH12	03
ASHDUMP WORKSHOP & SUBSTATION (P35) TYPICAL STORMWATER DETAILS HEADWALL DETAILS	0.84/7243-S23	01
ASHDUMP WORKSHOP & SUBSTATION (P35) TYPICAL STORMWATER DETAILS HEADWALL REINFORCEMENT	0.84/7243-S24	01
GENERAL CONSTRUCTION DRAWING TYPICAL CROSS SECTIONS THROUGH PAVING	0.84/7246-S03	09
GENERAL CONSTRUCTION DRAWING KERBING & DETAILS	0.84/7246-S04	10
GENERAL CONSTRUCTION DRAWING KERBING & DETAILS NO.2	0.84/7246-S13	04
ASH DUMP WORKSHOP GENERAL SEWER LAYOUT	0.84/7256-S07	5
ASH DUMP BUILDING SEWER LONG SECTION	0.84/7256-S08	2
ASH DUMP SUBSTATION POTABLE WATER LAYOUT	0.84/7258-S09	7
ASH DUMP SUBSTATIONS FIRE WATER LAYOUT	0.84/7258-S15	7
TYPICAL STORMWATER DETAILS 3 OF 3	0.84/7243-S03	5
SSB,WTP,LAB ADMIN ISLAND AND SUBSTATIONS TYPICAL STORMWATER DETAIL 2	0.84/7243-S02	11
SSB,WTP,LAB ADMIN ISLAND AND SUBSTATIONS TYPICAL STORMWATER DETAIL 1 OF 3	0.84/7243-S01	5
Medupi FGD Geotechnical Investigation Report	348-913228	1

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7. DOCUMENTATION

The following listed documents are included as attachments and shall form part of the Employer's Documents:

Table 2: Additional Documentation

Document No.	Rev. No.	Title
8CIVL053	03	Medupi Power Station Specification for Structural Concrete
200-1689	02	Medupi Quality Specification
200-46362	03	Site Quality Assurance, Control and verification work instruction
SSZ 200-207219	03	Medupi Power Station Safety, Health and Environmental Specification
240-77471499	02	Annexure B: Acknowledgement Form for Eskom SHE Rules
200-45965	06	Manufacturing Inspection & Testing Work Instruction
32-245	04	Eskom Waste Management Standard
240-62196227	06	Eskom Life Saving Rules
200-1679	04	Project Quality Plan
200-35208	02	Environmental Management Plan
PWI 200 – 5664	06	Engineering Change Management Work Instruction
200-24289	02	(Ssz_45-17), Medupi Power Station Corrosion Protection Specification
200-1680	06	Document and Record Management Procedure
200-53810	02	Documentation Handover List
200-6166	11	Eskom backfill specification
200-16817	05	Excavation permit
240-57127955	03	Geotechnical and Foundation Engineering Standard
200-94660	06	Issuing of KKS certificate
200-15406	03	Issuing of takeover certificate
200-3340	04	KKS Coding and Labelling
200-18202	04	KKS Key Part Standard
200-5343	09	List of Abbreviations
200-73971	06	Medupi EMS Scope and Manual
200- 162027	01	Record of Decision (ROD) for the Medupi Project ref no.12/12/20/695
240-85549846	02	Standard for Design of Drainage and Sewerage Infrastructure
200-4190	04	The application of KKS plant coding (NMP 45-7)
240-82410629	02	Environment Management Strategy

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8. AUTHORISATION

This document has been seen and accepted by:

Designation
Medupi Project EDWL
Medupi Project Engineering Manager
Medupi LDE Civil Engineering
Medupi Configuration Manager
Medupi Quality
Medupi Environmental
Medupi Safety Department
Medupi Dokument Control Manager

9. REVISIONS

Date	Rev.	Remarks
04/06/2021	1	
13/0/2021	2	Updated section 2.1, 3.5, 4.2.1

10. DEVELOPMENT TEAM

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

11. ACKNOWLEDGEMENTS

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