

	Scope of Work	Generation
---	---------------	------------

Title: **Clarifier 48 Launder
Construction Joints Repairs
Scope of Work**

Unique Identifier:

Alternative Reference
Number:

Area of Applicability: **Maintenance**

Documentation Type: **Scope of Work**

Revision: **0**

Total Pages: **12**

Next Review Date: **N/A**

Disclosure Classification: **CONTROLLED
DISCLOSURE**

Compiled by

Supported by



Template Identifier:

CONTENTS

	Page
1 INTRODUCTION	3
2 SUPPORTING CLAUSES	3
2.1PURPOSE	3
2.2APPLICABILITY	4
2.3NORMATIVE/INFORMATIVE REFERENCES	4
2.4DEFINITIONS	5
2.5DISCLOSURE CLASSIFICATION	5
2.6ABBREVIATIONS	5
2.7ROLES AND RESPONSIBILITIES	6
3 SCOPE OF WORK	7
3.1DESCRIPTION OF THE WORKS	7
3.2REPAIR METHODOLOGY	9
4 STAKEHOLDER ENGAGEMENT	12
5 AUTHORISATION	12
6 REVISIONS	12
Figure 1: Clarifier 48 Launder	3
Figure 2: Leaks on Clarifier 48 launder construction joints	4

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.

1 INTRODUCTION

Duvha Power Station, owned and operated by Eskom is a coal fired power station located in Witbank, Mpumalanga Province. The Power Station has WTP clarifiers on the northern side of the station. Clarifier 48 has the launder that goes to Cooling Tower 5&6 and its concrete structure was constructed in sections (segments) and construction joints were created. Construction joints were made watertight by cast-in of Polyvinyl chloride (PVC) water stops at the middle of the concrete joint, joint fillers and joint sealants.

Over the years after construction, the joint waterproofing material has aged and allow water to seep through the construction joints. It is evident in the plant that Clarifier 48 concrete structure launder is leaking when Clarifier 48 is in service. The waterproofing material for the launder structures requires replacement. The repair works shall be conducted on the internal and external launder surface construction joint areas, and it is important for the launder to be free of debris and be completely dry to start working on it.



Figure 1: Clarifier 48 Launder

2 SUPPORTING CLAUSES

2.1 PURPOSE

The purpose of this document is to outline the scope of work to repair the construction joints of Clarifier 48 launder concrete structure that is leaking as shown on the **figure 2** below. There are signs of joint fillers and joint sealants failures on the construction joints of the launder.

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.



Figure 2: Leaks on Clarifier 48 launder construction joints

2.2 APPLICABILITY

This document applies to Duvha Power Station only.

2.3 NORMATIVE/INFORMATIVE REFERENCES

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

2.3.1 Informative

- [1] Construction Regulations, 2014
- [2] QM58 - Suppliers contract quality requirements specification
- [3] MGM0001 - Maintenance Quality Manual
- [4] 240-99527377 - Inspection Manual For Civil Works at Eskom's Power Stations
- [5] SANS 2001 Part CC1: Concrete works (structural)
- [6] SANS 10100-2 (SABS 0100-2), The structural use of concrete – Part 2: Materials and execution of work.
- [7] SANS 10400 (SABS 0400), The application of the National Building Regulations.

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.

2.3.2 Normative

- [1] 474-58 (Rev1): Document and Records Management
- [2] ISO 9001 Quality Management Systems.
- [3] 32-727 - Eskom Safety, Health, Environment and Quality (SHEQ) Policy
- [4] Occupational Health and Safety Act No. 85 of 1993,

2.4 DEFINITIONS

None

2.5 DISCLOSURE CLASSIFICATION

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

2.6 ABBREVIATIONS

Abbreviations	Descriptions
CW	Cooling Water
OHS	Occupational Health and Safety Act No 85 of 1993
PPE	Personal Protective Equipment
PVC	Polyvinyl chloride
QC	Quality Control
QCP	Quality Control Plan
QM	Quality Management
SABS	South African Bureau of Standards
SANS	South African National Standards
SE	System Engineer
SHEQ	Safety, Health, Environment and Quality
WTP	Water Treatment Plant

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.

2.7 ROLES AND RESPONSIBILITIES

2.7.1. Appointed Contractor

- All contractors shall work within the parameter of the job description and scope of work. To keep all instructions/ procedures on hand and supply Eskom power station with reference to be included in this document and supply record and history requirements.
- Contractors must also ensure that the work is performed to the highest standard and safety standards and regulations.
- Execute the scope of work as per Occupational Health and Safety Act 85 of 1993.
- Execute the scope of work as per the employer's specification. To ensure quality assurance is done as per QM 58 and SHEQ Policy is adhered to.

2.7.2. Project Manager

To ensure that the supplier execute all the work specified in the scope of work on the set timelines and also ensure that:

- All work is executed in accordance to the legal requirements (Occupational Health and Safety Act 85 of 1993).
- All employees are provided with the prescribed personnel protective equipment (PPE) as required.
- All workers are familiar with the risk assessment, safety precautions and hazards
- The work is carried out by appropriately authorised or competent person.
- Ensure that all documents are accurately completed and signed before returning the documents like service instruction and information documentation to Work Management Department for capturing and filing.

2.7.3. System Engineer (SE)

- As custodian of the Maintenance Basis, they must ensure all actions required in terms of the reliability base and any other reliability matters are implemented on their systems.
- Must inspect the system after the maintainer has maintained, following the approved quality control plan.
- The SE will review the scope of work developed by maintenance and the work, which will be executed and ensure that quality assurance is adhered to.

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.

2.7.4. Maintenance Technician

- Inspection of all hold/witness points indicated on the QCP
- Must ensure work is done to the highest standard and regarding to the safety regulations.

3 SCOPE OF WORK

3.1 DESCRIPTION OF THE WORKS

3.1.1. Scope overview

WTP Clarifier 48 launder has four construction joints that are defective and need to be repaired. WTP Clarifier launder is a reinforced concrete structure designed to channel CW dosing water to Cooling Towers ponds and it has a cross section dimensions of 250mm thick, 1120mm depth and 2200mm wide. The waterproofing lining material on the construction joints have deteriorated over years and CW dosing water is seeping through when the launder is in service.

The Contractor is responsible for executing all repairs and replacement works as detailed in this document.

The Contractor shall successfully execute the repairs works to ensure that the affected system is reinstated to good working condition. The Contractor takes all necessary precautions that may be required to safeguard existing infrastructure and services including protection of all surface works against the ingress of surface water.

This includes detailed inspections and assessment, supply/procurement of material, cast concrete grout, investigation, testing, deliveries, off-loading at the Power Station site, disposal of debris, barricading, erection/ construction, final painting/coating and finishing complete in every detail.

Precautions and Requirements

- The Contractor shall execute the work as per the specification provided.
- The Contractor shall supply a method statement before any execution of work to the Eskom Engineer detailing how the scope will be safely done.
- The Contractor must have necessary technical personnel to execute the work as listed on the technical criteria.

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.

- The Contractor wears appropriate PPE such as chemical resistant overalls with reflectors, rubber gloves, FFP2 type dust masks, gumboots, hard hat, ear and eye protection suitable for WTP working conditions. The pH level on water is around 8.3 to 8.7 and wearing chemical resistant work overalls at WTP is in conformance to Duvha Power Station Safety Standards and Procedures.
- The Contractor abides and conforms to Occupational Health and Safety Act 85 of 1993 and Generation Plant Safety Regulations (240-150642762). No work will resume or be undertaken without permit to work.
- The Contractor proposes a water control plan to the Project Manager for acceptance and implementation for the duration of the works. As part of water control plan, the Contractor ensures that the work area is free of water. The Contractor must do continuous pumping of water using 7 l/s Grade 316 stainless pumps, supplying, and laying of sandbags to build a coffer wall/s, and or to do any alternative method type to prevent water coming to the works.
- Under no circumstances will the Contractor be permitted to discharge contaminated water in any drain or channel or in natural environment except discharging into the launder or clarifier/s or Cooling Tower. Discharging and leaking of contaminated water into the natural environment and or to the natural ground is an environmental legal contravention, and as such it is not allowed. If the Contractor is found to be contravening it will be held liable.
- The Contractor shall provide waste disposal bins or skips for any hazardous waste substance generated while working. The Contractor disposes of hazardous waste substance at a licenced waste disposal site to be accepted by the Project Manager. The Contractor will be responsible for transportation of the rubble from site to a licenced dumping site.
- The Client provides waste disposal bins or skips for all building/concrete rubble and domestic waste. The area location of skip bins will be agreed by the Contractor and the Project Manager or his/her delegate during site kick off meeting. The Client disposes of all building/concrete rubble and domestic waste at a licenced waste disposal site. The Client will be responsible for transportation of the rubble from site to a licenced dumping site.
- The Contractor shall furnish the Project Manager with Safety Disposal Certificates/Records of the waste from the licensed dumping site. If the Contractor is found to be dumping hazardous waste and rubble in illegal dumping site will be reported to Law Enforcement Agencies/Authorities, and will be held liable.

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.

- When concrete mixing will be done on site, the Contractor must compile a method statement detailing on how they will prevent spillages if possible and clean-up procedures when spillages do occur. Cement products and grouts are classified as hazardous chemical substance and they should be stored and handled during the works as per Manufacturer's Safety Data Sheet (MSDS) and the Duvha Waste Management Procedure ENVP005.
- The Contractor takes note that review and acceptance of any document/ drawing by the Project Manager in no way relieves the Contractor of his liability for the works. The Contractor remains liable for all works conducted as per this document.
- The Contractor interacts with others through the Project Manager, to ensure seamless integration of the various works.
- Only competent personnel are allowed to perform repair and replacement works of all infrastructure.
- The Contractor's site management team maintains records of competency and experience and must keep them in the file for audit purposes.
- Contractor to submit a comprehensive method statement for the works required to the project manager prior commencement of the works.
- All dimensions shall be confirmed by the contractor on site.

3.2 REPAIR METHODOLOGY

WTP Clarifier 48 launder has four (4) construction joints that requires to be repaired. Launder cross sectional dimension sizes are 250mm wall and floor thickness, 1 120mm total depth (870mm deep waterway) and 2 200mm wide. The scope entails the following:

- The Contractor implements a water control plan and maintains it for the duration of the works.
- Prepare the surface by removing the old waterproof membrane on all four construction joints in the launder.
- Clean the working area to expose existing concrete and remove all debris.
- Chip off the concrete around construction joints to make grooves to insert combiflex waterproof membranes and make good finishes.
- Remove the existing joint sealant of about 30mm deep inside and outside the walls and floor.
- Apply 'wet to dry' epoxy to concrete surface where new concrete or grout will be casted.

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.

- Repair concrete in all pitted areas and around the construction joints using PRO-STRUCT 530 MCI high strength construction grout product. Mix and apply the PRO-STRUCT product material as per the manufacturer's instruction.
- Supply and apply new SikaSwell® S-2 joint sealant product about 30mm deep to able water stops at the centre of the construction joints and apply it on both internal and external surface of the construction joints. Handle and apply SikaSwell® S-2 joint sealant product material as per the manufacturer's instruction.
- Apply new Sikadur-Combiflex® SG-20 P product together with Sikadur®-31 DW adhesive (Component A&B) on the surface of the concrete joint on both internal and external surface of the joints. Make good finishes after applying waterproof membranes.
- Remove all the rubble, clean the areas and do good housekeeping.

i) General Requirements:

Material:

a. PRO-STRUCT 616

PRO-STRUCT 616; Wet to Dry PRO-STRUCT 616 concrete adhesive bonding agent. PRO-STRUCT 616 is a two component, solvent-free modified epoxy designed to penetrate dry concrete surfaces and bond wet new concrete to it. The properties achieved caters for the movement differential between the old and new concrete

b. PRO-STRUCT 530 MCI HIGH STRENGTH CONSTRUCTION GROUT

Pro-Struct 530 is a cement-based, non-shrink grout ideal for general construction grouting applications. Pro-Struct 530 meets CRD-C-621 and can be installed over a wide temperature range. Pro-Struct 530 provides high strengths and can be mixed from dry pack to flowable consistency and can be extended with 6mm stone to produce micro-concrete. PRO-STRUCT 530 MCI grout must be supplied with Pro-Struct 53-MC Aggregate of 6mm diameter.

c. SIKASWELL® S-2 JOINT SELANT Hydrophilic swellable joint sealant

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.

SikaSwell® S-2 is a 1-part polyurethane hydrophilic sealant which swells in contact with water to seal all types of construction joints and penetrations in concrete structures. It is used to adhere the SikaSwell® A and SikaSwell® P profiles to the structure.

d. SIKADUR-COMBIFLEX® SG-20 P COMBO KIT (including tape and adhesive)

Sikadur-Combiflex® SG-20 P is a flexible waterproofing tape based on modified flexible Polyolefin (FPO) with advanced adhesion properties or similar approved product. Sikadur-Combiflex® SG-20 P is a flexible waterproofing tape must be 2.00mm thick and 250mm wide.

Sikadur®-31 DW adhesive (Component A&B) is a 2-part epoxy based moisture tolerant, thixotropic, structural adhesive which bonds most construction materials and similar approved product

ii) Quality Control

All work is carried out under the supervision of an experienced Contractor Supervisor. The Contractor complies with the Employer's Quality Requirements as specified in Eskom Generation Standard QM58 Rev2. All quality control documentations are to be submitted to the Project Manager within 7 days after contract award.

- The Contractor to provide a Quality Control Plan to Project Manager for approval prior to construction. The Contractor shall also assure that the following quality control documentation are available during construction and are submitted to the Project Manager on completion.
- QCP plan with signed off witness and hold points by all stakeholders (Client QC, Project Engineer and Contractor Rep)
- At least seven days prior to the delivery of material on site, the Contractor shall submit a material certificate to the Project Manager of the proposed material for acceptance.
- The Contractor shall submit material test certificates and grout mix design to the Project Manager for acceptance.

3.3 RELATED/SUPPORTING DOCUMENTS

None

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.

4 STAKEHOLDER ENGAGEMENT

This document has been seen and accepted by:

Name & Surname	Designation	Signature

5 AUTHORISATION

This document has been seen and accepted by:

Name & Surname	Designation

6 REVISIONS

Date	Rev.	Compiler	Remarks

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.