Eskom	Report	Technology

Title:	**Detail Design Report <template>**	Unique Identifier:	**xxxx**
		Alternative Reference Number:	**N/A**
		Area of Applicability:	**Engineering**
		Documentation Type:	**Report**
		Revision:	**?**
		Total Pages:	**14**
		Next Review Date:	**???**
		Disclosure Classification:	**CONTROLLED DISCLOSURE**

Compiled by	**Functional Responsibility**	**Authorised by**
……..	……..	……..
<Initials and Surname>	**<Initials and Surname>**	**<Initials and Surname>**
<Designation>	**<Designation>**	**<Designation>**
Date: ……	Date: ……	Date: ……

CONTENTS

TABLES

EXECUTIVE SUMMARY

Provide a summary of the system's design objectives for this design phase and describe the achievement of these design objectives, both in terms of the technical design output and achieving the major technical performance requirements. Describe major outstanding issues, technical risks and lessons learned.

1. INTRODUCTION

This document provides design status information on the completed detail design phase for [System]. This document is a major input to the formal design review process at the end of the design phase and describes the design process and technical output for the phase. The document contents provide an overview to the technical reviewers who will then, where required, use the actual design documents for performing their review.

The purpose of the detail design phase is to:

1. Establish a complete design, i.e. to produce all the component specifications, engineering drawings and other design documentation for procurement, fabrication, installation, construction and commissioning;
2. Ensure integration (utilities, mass and energy, system control, interfaces, etc.) of sub-system detail designs;
3. Finalise the layout designs with actual component data as input and resolve clashes;
4. Integrate operating and maintenance designs;
5. Consolidate and standardise bulk items for procurement;
6. Formalise the acceptance test procedures for product validation; and
7. Develop construction, installation and commissioning procedures.

System Identification

This paragraph should identify the system as applicable:

- Identification / codification number of the system;
- System name;
- Official abbreviation of the system name (if any); and
- Version number of the system.

System Overview

This section should briefly state the intended use, the main functions that the system must be capable of performing in order to accomplish its intended purpose and the relationship this system has with any larger system.

The section should also summarise the history of system development (i.e. concept and basic phases).

2. SUPPORTING CLAUSES

2.1 SCOPE

Describe what the document covers as well as its limitations (parameters for applying the document).

This document provides an overview of the engineering processes followed and the system design status at the end of the detail phase. The document includes the results of technical assessments to determine compliance with stakeholder requirements, technical risks identified, lessons learned during the design process and outstanding issues for this design phase. This document further provides references to the design output documentation.

This document does not provide design cost, schedule or other project management type information.

2.1.1 Purpose

Give a clear, concise statement explaining the specific purpose of the document and why this document is necessary.

This document summarises the status and outcome of the detail phase design related activities and describes the achievement of the design goals, in terms of meeting stakeholder requirements. This document, together with the design output documentation of this phase, is submitted for review.

2.1.2 Applicability

Describe to whom the document applies.

2.2 NORMATIVE / INFORMATIVE REFERENCES

List the references under the following paragraphs.

2.2.1 Normative

[1] xxxxx

[2] xxxxx

These documents are indispensable for the application of this document, i.e. documents to be used in conjunction with this document.

2.2.2 Informative

[3] xxxxx

[4] xxxxx

List documents that are further sources of information referenced in your document, e.g. laws, standards, codes and procedures.

2.3 DEFINITIONS

Include all definitions applicable to this document, numbered (2.3.1, 2.3.2, etc.) and in alphabetical order. Explain all terms used, including documents, titles and departmental references that may cause confusion, if not explained. Preferably use definitions listed in international standards.

2.3.1 Disclosure Classification

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

2.4 ABBREVIATIONS

Abbreviation	Description

Abbreviation	Description

In the preceding table, list and describe all abbreviations used in the document, in alphabetical order.

3. DETAIL DESIGN INFORMATION

The following paragraphs shall summarise the engineering outcomes of the detail phase. Provide a short description of the important design, design integration, design assessment issues and technical risks. Provide a reference to an approved document where more information can be obtained. During this phase, detail designs are released for major component manufacture / procurement. Before such release, however, each sub-system / major component design is reviewed at the higher system level for completeness, conformance and integration with other sub-systems. The results of these conformance and integration reviews should be summarised and the applicable design reports referenced.

The contents of this report should be tailored to suite the particular project.

3.1 OBJECTIVE OF THE DETAIL DESIGN PHASE

Describe the objective of the detail design phase.

3.2 SYSTEM SUMMARY DESCRIPTION

This paragraph should provide a short system description.

3.3 CONTRACT BREAKDOWN STRUCTURE

This paragraph should provide an overview of the suppliers / design authorities involved in the detail design of the systems, sub-systems and / or components.

3.4 SYSTEM DETAIL DESIGN OVERVIEW

The following paragraphs should provide an overview of the system design at the end of the detail design phase. Provide information about outstanding designs issues and associated risks. The following headings are examples that can be used:

3.4.1 Site and Building Layout Design

This paragraph should describe the site and building layout design with references to the layout reviews, risks and 3D model or layout drawings.

3.4.2 Site Infrastructure Design

This paragraph should describe the site infrastructure design.

3.4.3 Civil Building and Structural Design

This paragraph should describe the civil building and structural design.

3.4.4 Main Plant Process Design

This paragraph should describe the main plant process design.

3.4.5 External Interface Design

This paragraph should describe the external interface design.

3.4.6 Sub-System Interface Design

This paragraph should describe the interfaces between major sub-systems (including the interfaces between sub-systems and buildings, structures, utilities and site services where applicable).

3.4.7 Electrical System Design

This paragraph should describe the electrical system design (e.g. auxiliary electrical distribution supplying power to all systems or components).

3.4.8 Control and Instrumentation System Design

This paragraph should describe the control and instrumentation system design.

3.4.9 Piping Design

This paragraph should describe the piping and piping layout design.

3.4.10 Bulk Item Consolidation

This paragraph should describe the bulk item consolidation activities completed.

3.4.11 Business Information System Design

This paragraph should describe the business information system design.

3.4.12 Network Process Design

This paragraph should describe the network process design.

3.4.13 Primary Plant Design

This paragraph should describe the primary plant design.

3.4.14 Secondary Plant Design

This paragraph should describe the secondary plant design.

3.4.15 Lines Design

This paragraph should describe the lines design.

3.5 UB-SYSTEM DETAIL DESIGN

3.5.1 Sub-system Design

This paragraph should provide a technical summary of each sub-system and / or major component design at the end of the detail design phase. Provide references to sub-system design reports.

3.5.2 Sub-system Design Review

This paragraph should provide a technical summary of lower-level design reviews held (also critical design reviews) to establish manufacturing / procurement readiness and list any unresolved issues and risks.

Provide references to sub-system design review reports.

3.5.3 Sub-system Safety Assessments

This paragraph should provide a summary of all HAZOP and / or other safety assessments performed.

3.5.4 Long Lead Items

List long lead item design and procurement status and indicate the risks and mitigation strategies, where applicable.

3.6 SYSTEM MAINTENANCE AND OPERATING DESIGN

This paragraph should list and provide a summary of the system maintenance and operational technical document status.

3.6.1 Maintenance Design

This paragraph should provide a summary description of the maintenance development for the system, in terms of:

- Maintenance planning;
- Facilities required (workshops, etc.);
- Packaging, handling and transportation requirements;
- Test and support equipment required (tools, conditioning monitoring, calibration equipment, etc.);
- Maintenance personnel training requirements (resources, training material, training facilities, etc.);
- Maintenance manuals and other support documentation;
- Computer resources required (software, hardware, etc.); and
- Maintenance personnel required (grades, competencies, etc.).

3.6.2 Operating Design

This paragraph should summarise the system operating development in terms of the following, where applicable:

- Operating Manuals; and
- Operating technical specification input.

3.7 WASTE MANAGEMENT

3.7.1 Water Purification

This paragraph should summarise the water purification design.

3.7.2 Waste Storage and Transportation

This paragraph should summarise the waste generated by the system operations, waste storage facilities, waste handling facilities and waste transportation arrangements away from the site.

3.8 SYSTEM SAFETY ANALYSIS

This paragraph should summarise system-level HAZOP and / or other safety analyses performed during the detail design phase and list the outstanding and unresolved issues.

3.9 SYSTEM TECHNICAL INTEGRATION REVIEWS

This paragraph should provide an overview of all integration reviews and any outstanding and unresolved issues. During the integration reviews interfaces, utilities and layout drawings / models are reviewed to ensure complete integration. Use the following headings as appropriate:

3.9.1 Site Integration

This paragraph should provide a summary of reviews held to ensure site integration.

3.9.2 System Layout Integration

This paragraph should provide a summary of reviews held to ensure system layout integration within buildings and facilities.

3.9.3 Civil and Structural Design Integration

This paragraph should provide a summary of reviews held to ensure civil and structural design integration and interfaces with sub-systems and components, including all building penetrations and attachments.

3.9.4 Process Integration

This paragraph should provide a summary of integration reviews held to ensure process design and system controllability integration between sub-systems, including the integration of utilities requirements.

3.9.5 Mechanical System Integration

This paragraph should provide a summary of all integration reviews held to ensure mechanical integration of sub-systems and components, including all physical mechanical and piping interfaces.

3.9.6 Electrical Design Integration

This paragraph should provide a summary of integration reviews held to ensure electrical power distribution and load integration with sub-systems and components.

3.9.7 Control System Integration

This paragraph should provide a summary of integration reviews held to ensure system, sub-system and component control integration.

3.9.8 Primary Plant Integration

This paragraph should provide a summary of integration reviews held to ensure primary plant integration.

3.9.9 Secondary Plant Integration

This paragraph should provide a summary of integration reviews held to ensure secondary plant integration.

3.9.10 Lines Integration

This paragraph should provide a summary of integration reviews held to ensure lines integration.

3.9.11 Other

This paragraph should describe any other integration activities performed.

3.10 SYSTEM DESIGN ASSESSMENT

Describe the assessments performed as applicable.

3.10.1 Operability

This paragraph should summarise the results of the operability assessment.

3.10.2 Reliability, Maintainability, Availability

This paragraph should summarise the results of a RAM assessment and provides a comparison to the RAM design objectives.

3.10.3 Inspectability

This paragraph should summarise the results of the inspectability assessment.

3.10.4 Procureability

This paragraph should summarise the results of the procureability assessment.

3.10.5 Constructability

This paragraph should summarise the results of the constructability assessment.

3.10.6 Sustainability

This paragraph should summarise the results of the sustainability assessment.

3.10.7 Expandability

This paragraph should summarise the results of the expandability assessment.

3.10.8 Life-Cycle Cost

This paragraph should summarise the results of the life-cycle cost assessment.

3.11 SYSTEM SAFETY ASSESSMENT

This paragraph should summarise the final system-level fire safety and industrial safety assessments and list the outstanding issues and resolution.

3.11.1 Fire Safety Assessment

Summary results of fire safety assessment.

3.11.2 Industrial Safety Assessment

Summary results of industrial safety assessment.

3.11.3 Environmental Assessment

Summary results of environmental assessment.

3.12 SYSTEM SECURITY DESIGN

This paragraph summarises the security system design.

Note: Information provided should be in line with the security classification of the information. Provide a reference to security classified documents only where necessary.

3.13 TEST AND COMMISSIONING STRATEGY

This paragraph should describe the updated test and commissioning strategy for the plant.

3.14 RISK REGISTER

This paragraph should summarise high-risk items and their mitigation strategies and provide a reference to the risk register for the other risk items.

3.15 OTHER DESIGN ISSUES

This paragraph should summarise issues not addressed above.

3.16 LESSONS LEARNED

This paragraph should describe any lessons learned during this design phase.

4. AUTHORISATION

This document has been seen and accepted by:

Name	Designation

In the preceding table, list the manager(s) of the divisions that will be affected by the content of this document.

5. REVISIONS

Date	Rev.	Compiler	Remarks
Month 20xx	X	Insert initials and surname.	Specify reasons for compiling of document.
Month 20xx	X	Insert initials and surname.	Specify reasons for revision of document. List all changes to the document, as well as authorities for these changes.

6. DEVELOPMENT TEAM

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

- Insert text here

7. ACKNOWLEDGEMENTS

Insert text here.

APPENDIX A: DESIGN OUTPUT DOCUMENTS

Design output documents. Provide a reference to the Master Record Index / Document Record Index if this list is too comprehensive.

Table 1: Detail Design Output Documents

Document Number	Rev.	Document Title	Remarks