



TECHNICAL ADVISORY NOTE: STAGE OF DESIGN REQUIRED FOR STATUTORY REVIEW IN SUPPORT OF LICENSE CONSIDERATIONS BY AUTHORITIES

1. Introduction

This document is made available to persons seeking guidance on the stage of design to be incorporated in technical design reports in the field of engineering as contemplated in water use, waste management, and/or mining license application legislation.

The purpose of this guide is to reduce confusion amongst professional service providers in the industry and simultaneously improve the efficiency of the licensing process and in particular the productivity of scarce occupational classes. It is intended to aid persons who seek improved knowledge or experience in the field of technical design report writing without detracting from specialist skills; however, it is not intended to be an all embracing definitive guide, as each license application (or amendment) may have its own unique attributes.

This guide is provided without prejudice and neither the Department nor its employees can be held accountable for neither the use thereof, nor the consequences therefrom.

2. Legislative Framework

It is recommended that the applicant and his/her agents are familiar with all pertinent legislation for the particular license application, however particular attention is given to inter alia the following regulations in respect of design stages and standards:

- **Engineering Professions Act, Act 46 of 2000, Board Notice 41 of 2017**
- **Engineering Professions Act, Act 46 of 2000, Board Notice 138 of 2015**
- **National Water Act, Act 36 of 1998, WULAA Regulations 2017**
- **National Water Act, Act 36 of 1998, GN704 of 1999,**
- **National Environmental Management Waste Act, Act 59 of 2008, R636 of 2013 Norms and Standards**
- **National Environmental Management Waste Act, Act 59 of 2008, R632 of 2015, the Planning and Design of Residue Stockpiles and Residue Deposits**
- **Technical Advisory Note: WULAA regulations, technical design reports**
- **Technical Advisory Note: Capping**

3. Stages of Design

The title given to technical reports is often inconsistent with the contents, and various adjectives are used which can be quite misleading. Descriptions such as a planning design, concept design, prefeasibility assessment, detail design, and final design, are used erroneously with contents often being merely an inception report or a desktop conceptual design without established design criteria. In issuing an authorisation, a responsible authority is required to take into account all “relevant factors” (NWA, Act 36 of 1998 section 27), be they past or future impacts and their mitigation measures, which are to be quantified for the life cycle.

The term “final design” is undefined, but generally interpreted as the post-construction as-built drawings that show the deviations from the tender stage design. This is not what is called for in license application design submissions, as it is a detailed post facto record of development, whereas the level of design detail and planned construction quality assurance required for performance assessment precedes the implementation of a project.

The reader’s attention is drawn to the WULAA Regulations 2017 and the D: WUL instruction to specialist reviewers in that regard, dated 1 October 2018, which the regulatory branch believed to be necessary following the Auditor General’s report in the middle of 2018. The Auditor General found about 50 non-compliances allegedly due to Departmental specialists asking for additional information, which is outside of the defined procedure. Please see the first two attachments defining the roles and responsibilities of the various officials (regional head, case officer, subject specialists, WUAAAC etc.) in the procedure and timeframes.

When the technical report or design report as the case may be, is presented for the engineering review, the Case Officer should already have provided guidance to the applicant on what is necessary for the license application including the various water uses contemplated. See the *Technical Advisory Note: Specialist reports on civil design in support of water use, waste management and/or mining license applications* addressing design report content. The range of activities that may require water use authorisation is too diverse to list, and hence the principles are included and reference to standards in that technical advisory note, although not necessarily complete, but quite understandable to a registered engineer. (The skills levels required of an engineer, a technologist, and a technician are covered in the Washington Accord, Sydney Accord, and Dublin Accord respectively and are easily downloadable from the internet. In essence the difference lies in the degree of complexity and address of uncertainty in problem solving.) Different regulations require sign-off by specific skilled persons such as the mining regulations pertaining to residue deposits and residue stockpiles (NEMWA Regulations 2015, R632) and the Waste Management Regulations R636 (NEMWA Regulations 2013) etc.

A registered person in respect of the Engineering Professions Act, Act 46 of 2000 is required to comply with the Code of Conduct for registered persons, Board Notice 41 of 2017. Although all rules need to be complied with, including on competence,

dignity, public safety, environmental consideration, and administration, it is worth noting that decisions must be honest, fair and based on fact.

So, when a WULA technical report or design report (depending on water uses) is submitted for review it should be signed-off by a registered person with the necessary skills and diligence, and based on fact. To provide further assistance on understanding the level of detail required, the reader's attention is drawn to ECSA Board Notice 138 of 2015, which provides the various stages of a project in its Regulation 3(2) as follows:

- **Stage 1 – Inception,**
- **Stage 2 – Concept and Viability (also termed Preliminary Design),**
- **Stage 3 – Design Development (also termed Detail Design),**
- **Stage 4 – Documentation and Procurement,**
- **Stage 5 – Contract Administration and Inspection, and**
- **Stage 6 – Close-Out**

The inception stage is far too early for performance evaluation as it is the stage addressing the client/engineer relationship and scheduling of required tasks for the next Stage. The deliverables of the inception phase include a report on functional requirements and scheduled surveys. The second stage being Concept formulation and Viability requires definition of scope, scale, form and function, and preliminary programme and viability. Elements include establish the concept design criteria, prepare a preliminary concept design and advise the client regarding further surveys, analyses, tests and investigations, including establishment of regulatory requirements to be incorporated into the design. Thereafter the concept is to be refined to ensure conformance and the deliverables will include inter alia a preliminary design. This level of design is generally inadequate for regulations requiring a quantified performance, but may be adequate in some projects.

The third stage of design is defined as developing the concept to finalise the design, outline specifications, incorporating a cost plan and defining financial viability and programme for the project. It is in this stage that the regulatory requirements are to have been built into the design which is to be reflected in design drawings including draft technical details and specifications (see ECSA BN 138 page 14). It is this stage of design which is the basis of quantified performance assessment and subject to review by authorities. The ECSA regulations go so far as to state “submit the necessary design documentation to local and other authorities for approval”.

Having established that it is the completion of stage 3 being the design development that is generally required by authorities for design review, it is worth noting that stage 4 addresses documentation and procurement which is essentially the preparation of tender documentation for, and the procurement of construction services. The fifth stage of a project addresses construction administration and inspection. This is largely the implementation phase which culminates in certificates of completion and submission of reports to authorities etc. (ECSA BN 138 of 2015 page 16). This is followed by the 6th stage of close out.

From the above it is clear that it is at the end of the third stage of design development and prior to the fourth stage of compilation of documentation and procurement, that the authorities consider the design report and drawings. Some license considerations may include conditions that at the end of stage 5 the registered person shall demonstrate the practical completion of works in accordance with the design accepted for a license authorising the water use or similar activity.

The above should not be confused with the Dam Safety Regulations of 2012 which require consideration of the proposed dam and its associated risks to define a category for registration, acceptance of an approved professional person and/or team of experts, and license to construct followed by license to impound.

It is trusted that the above clarifies what is meant in the WULAA Regulations 2017 by a design report, using the ECSA Regulations and common practice, to show that engineering decisions are made based on fact and a predicted performance for a design report and drawings including specifications (also referred to as the feasible design).

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