

**ADDENDUM A: AMENDMENTS TO SKETCHPLAN COMMITTEE MANUAL  
VERSION 11.1 OF JUNE 2022**

**The purpose of this addendum is to amend the forms and requirements affecting the Civil and Structural engineering sections of the manual. The attached pages 2 to 12 replaces pages 39 to 56 of the manual.**

**Civil Engineering**

Consultant Civil Engineer to complete and sign this cover page. Attach to the outside of the set of documentation. DPW Counterparts to sign at the SPCM

PROJECT:		WCS NO :	REFERENCE NO:	
			Yes	No
1	The preliminary design has been completed in terms of conditions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2	Preliminary design report has been attached, see attached guideline and also refer to the engineer's manual	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3	The design has been coordinated with architect. Note: see engineer's manual for preliminary design documents	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4	The departmental engineer has been consulted	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5	The departmental engineer's comments have been incorporated into the design, if not, state reasons below	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6	Dolomite Status Certificate is attached	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Comments: \_\_\_\_\_

NAME Consultant Civil Engineer

SIGNATURE \_\_\_\_\_

FIRM/ COMPANY \_\_\_\_\_

DATE \_\_\_\_\_

<b>For completion by the Principal Agent</b>		Yes	No
Co-ordination between all disciplines have been done and all documentation aligned accordingly		<input type="checkbox"/>	<input type="checkbox"/>
NAME _____		SIGNATURE _____	
FIRM/ COMPANY _____		DATE _____	
<b>For completion by DPW Civil Engineer</b>			
For Sketch Plan purposes the recommendation to the SPC Chairperson is ACCEPT/NOT ACCEPT the Sketch Plan design submitted			
NAME _____		SIGNATURE _____	
DATE _____			

## **6.3.7. Civil Engineering Documentation Required**

### **SKETCH PLAN (PRELIMINARY DESIGN) STAGE - (CIVIL ENGINEERING)**

#### **General Comment**

The Department of Public Works has a large and diverse property portfolio. Various Departmental Guidelines have been prepared to assist Professional Consultants in the design and documentation of DPW Projects. They provide direction and guidance on DPW's requirements and enable Consultants to efficiently translate them into acceptable design solutions

The Guidelines are not intended to replace the level of initiative, competence and care as expected of consultants in the performance of their duties. Consultants are encouraged to carefully consider the merits of the Design Guidelines in the context of the needs of individual projects. If a Consultant considers a guideline not to be appropriate and that a more suitable solution is available, proposals to this effect should be raised for consideration by the Department

In the absence of express written approval for a deviation from Departmental guidelines, the Department will assume that the requirements contained in the various Design Guidelines have been fully addressed and incorporated in the proposed Design Solution and Specifications

Design calculations and investigations should be performed through all stages in an orderly, logical way. They should not only allow the design engineer to arrive at conclusions sufficient to lead to the preparation of detailed drawings, but their final form should reflect neat and systematic thought processes. At any time in the future someone wanting to check back on the original design should be able to find out what the design engineer was trying to achieve and what design standards he used

The engineer must take particular care in presenting the work connected with his design to ensure that:

- The design processes themselves are orderly, legible and logical so that the engineer charged with the checking should be able to follow them with ease
- The technical and academic quality is acceptable; and
- Adequate draughting standards are complied with

The Preliminary Design Report (PDR) gives the designer the opportunity to set out the design considerations and obtain approval for proposed deviations from Departmental standards. Where various options exist to arrive at a suitable design solution, the Department can select the preferred configuration based on information presented in the PDR. To enable the Departmental Civil Engineer to endorse the civil design at Sketch Plan Stage, the designer must have submitted a PDR documenting all facets of the design, to the Department

The following section proposes a checklist that should be completed by the Project Manager and Professional Consultant to ensure that the Departmental Civil Engineer has sufficient project detail to enable him to check the design proposal

## **Sketch Plan Checklist for the Civil Engineering portion of the design**

(Note: Although not specifically related to the Civil Engineering, the EIA and Heritage requirements of a project as well as any interface with Service Providers and Municipalities must be addressed in detail at sketch plan stage as they could have a substantial impact on the cost of the works.)

The checklist is generic and some of the listed items/activities may not be applicable to the particular project under review. Provision must be made for a response of Not Applicable and perhaps In Process. Generally most of the aspects should be addressed in the PDR but it can be possible that some of the processes haven't been taken to conclusion (EIA for example) before submitting the PDR. An objective decision on allowable exclusions will have to be made by the Project Manager after consultation with the Departmental Civil Engineer so that the Sketch Plan approval is not delayed

The questions/statements below require a Yes /No /Not Applicable response

### **1. General**

- The Project Manager has briefed Departmental Civil Engineer on client requirements and facility configuration
- The Civil Consultant has discussed design options/details with the Departmental Civil Engineer
- Environmental Impact Assessment
  - i) Application for exemption was made
  - ii) Scoping report was compiled and submitted
  - iii) Full EIA process is required by DEAT and has been initiated
  - iv) Environmental Authorization was obtained
- Have the requirements of the local municipality been established and taken into consideration in the design proposal?
- If a services report is required by the Municipality or Service Provider has it been compiled and submitted?

### **2. Preliminary Design Report (PDR)**

- A Preliminary Design Report (PDR) has been drafted in accordance with Clause B 1.4 of PW347 – Civil Engineering Manual, and has been forwarded to Departmental Civil Engineer
- The PDR includes the following:
  - a) General**
    - A Clear description of required facilities as defined by the Client Department. Definition includes function and purpose of facilities; the number and classes of occupants; periods of usage and usage patterns; all farming, abattoir or business activities listed separately
    - Confirmation by the Architect or Principal Agent that the description of the facility in the Engineer's PDR is accurate and complete.

Append letter of confirmation to report  
A summary of the Site Clearance information from the Site Clearance Report-Town Planning; problems identified at site clearance stage

- Locality of project including a large scale - provincial locality map and a small scale map showing locality in town
- Photos of typical or specific site characteristics – topography, access roads, vegetation, wetlands etc.
- Design criteria clearly referenced to Departmental or other guideline documentation. Deviations from standards clearly indicated and motivated
- Recommendations and motivation for further investigations, surveys and servitudes

#### **b). Water Supply**

- A preliminary assessment of water use as defined by the function or purpose of the facility
- Water demand per category calculated and presented in tabular form
- Tabled calculation of peak factors with reference to Departmental guidelines
- Local Fire Authority regulations and degree of assistance available from the Authority
- The facility classification in terms of fire risk. Tabled fire flow requirements with reference to Departmental or Fire Authority standard
- Layout drawing with position of municipal hydrants adjacent to site.
- Confirmation in writing from municipality of sufficient capacity in the municipal water supply infrastructure
- Results of investigations (diurnal flow and pressure readings) confirming the capacity of the municipal infrastructure. (Alternative to the written confirmation from municipality above)
- As-built data of Municipal water supply infrastructure
- Results of surveys, investigations, methodology and assumptions if as-built data is not available
- Verification of municipal water connection cost and the possibility of bulk water contribution cost
- A copy of the Service Level Agreement with the Service Provider is appended to this report. (Alternative to the verification of connection and bulk costs)
- Special requirements of the municipality and how these requirements have been incorporated in the design proposal.

- Where borehole water is to be utilized, test results from yield and quality tests. Recommendations on usage and abstraction rates by Geo-hydrologist
- The conceptual design of river abstraction method
- A recommendation on licensing requirements to utilize borehole or river water
- Proposals on water treatment, including disinfection, of borehole and river water. Results of the water quality analysis
- Water Storage requirements and proposal. Specific requirements of the user-department or requirements for fire fighting
- Confirmation that elevated storage towers are listed in EIA
- Proposed layout of water reticulation and placing of services. Pipe networks, ring mains etc. shown on sketch drawings
- Water supply design standards in terms of materials, hydraulic specification, velocity, pressure limits and roughness coefficients
- Specifications of materials, valves, air valves, PRV's, water meters etc.
- Placement of water meters to monitor water usage
- General arrangement and design basis for water supply pump stations, including operational control and standby capacity

**c). Storm water**

- Summary of statistical data of the nearest rainfall station
- The sub-catchment areas are shown on the layout plans
- Design criteria and calculation assumptions and methodology
- Design storm return period and tabulated runoff per sub-catchment
- A description of any specific design requirements in terms of storm water reuse or conduit size limitations
- Storm water design standards in terms of materials, hydraulic specification, velocity, pressure limits and roughness coefficients.
- Flood line for the 1:100 year storm event shown on the layout plan.
- Routing of storm water affecting cut and fill slopes on embankments or platforms
- Concept design of flood attenuating or control devices as well as a description of storm water management plan

**d). Sewerage**

- A preliminary assessment of sewer flow as defined by the function or purpose of the facility with tabulated results of calculations and design figures
- Table showing criteria and results of the peak factor calculations with reference to Departmental guidelines

- General arrangement and design basis for sewerage pump stations; including sump design, instrumentation and standby capacity
- Description of the type and capacity of the sewerage collection system
- Capacity assessment of municipal sewer or written confirmation of capacity by municipality
- Location and accurate level of municipal sewer indicated on the layout drawing
- Assessment of sewerage treatment options
- Outcome of Licensing and sewerage treatment discussions with DWAF
- Does the EIA scoping report include the establishment of an on-site sewerage treatment works?
- If on-site treatment has been proposed with irrigation of the final effluent, is there sufficient land available within the site boundary for irrigation
- Results of percolation tests if soak-aways are proposed
- Sewerage collection system design standards in terms of materials, min slopes, hydraulic specification, velocity and roughness coefficients
- Specifications of special materials, valves, pumps, macerators, water meters etc.
- Sewerage connection cost and the possibility of bulk sewer contribution cost

**e). Roads and Parking**

- The information relevant to vehicular traffic to be accommodated on the site e.g. Vehicle type loading, frequency and definition of functional areas
- Road classification for different functional users
- Local Authority or the road owner's regulations applicable to access
- Bulk contribution cost to municipality for access roads
- Results or recommendation on traffic study
- Applications lodged for way leaves
- Road and pavement design criteria

**f). Earthworks**

- Final site layout obtained from Architect
- Platform elevations obtained from Architect
- Retaining wall requirements communicated with Structural Engineer
- Slope stability and method of stabilization detailed and motivated

- Preliminary cut and fill volumes calculated and balanced
- Proposed design standards for earthworks
- Borrow pits and Spoil sites have been identified
- Borrow pits and Spoil sites were included in EIA scoping report

**g). Construction Specifications and Form of Contract**

- Construction Standard Specifications e.g. SANS 1200; COLTO
- Form and Conditions of contract specified e.g. GCC 2004, JBCC

**h). Cost Estimate**

- Cost estimate and comparison of the various design options
- Life cycle cost where needed to motivate between options and select final design configuration

**i). Appendices**

- Confirmation by the Architect or Principal agent that the description in the Engineers PDR is accurate and complete
- Summary and Recommendations from Site Clearance Report.
- EIA – Environmental Authorisation
- Marked up architects drawings showing concept design and layout of roads and parking; bulk water supply and water reticulation; sewerage reticulation, sewer outfall, sewerage treatment, effluent or alternative sewerage disposal; storm water catchments, collection and conveyance systems
- General arrangement of pump stations
- Recommendations of Geotechnical Investigations
- Recommendations of Traffic Study
- Correspondence with Local Municipality including Service Level Agreement (SLA)
- Correspondence/ Environmental Authorisation - Road Owner.
- Way leave applications
- Photos of typical or specific site characteristics. Results of Water and Sewerage investigation
- Results of Water and Sewerage investigation
- Explanatory drawings, typical details or typical road cross sections

**j). Dolomite Issues**

- During the design or execution (Construction) stage of the project the Project Manager (PM), consultant team and contractor should be alert and pro-active in locating and/or detecting any trace or sign of the presence of dolomite



- Should this be found, it must immediately be brought to the attention of the PM and the designated official responsible for dolomite matters at the Regional office/ Head office
- As and where applicable, appropriate designs/specifications/details for dolomite conditions should conform to the Department's manual: "Appropriate development of infrastructure on dolomite", Document PW 344
- Should there be any uncertainty about the presence of dolomite and/or unscheduled ground movement event, then such enquiries should be referred to the Directorate: Civil & Structural Engineering at Head Office for further investigation and subsequent certification

**Structural Engineering**

Consultant Structural Engineer to complete and sign this cover page. Attach to the outside of the set of documentation. DPW Counterparts to sign at the SPCM

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Comments: \_\_\_\_\_

NAME Consultant Structural Engineer

SIGNATURE

FIRM/ COMPANY

DATE

<b>For completion by the Principal Agent</b>	
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NAME

SIGNATURE

FIRM/ COMPANY

DATE

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 For Sketch Plan purposes the recommendation to the SPC Chairperson is ACCEPT/NOT ACCEPT the Sketch Plan design submitted

NAME

SIGNATURE

DATE

### **6.3.9. Structural Engineering Documentation Required**

The following Documents should be used for the Compilation of Preliminary Design Reports: Structural (PDR-S) and is available on the Public works website:

#### **PDR-S 00: GENERAL NOTES**

#### **DOCUMENTS FOR THE COMPILATION OF PRELIMINARY DESIGN REPORTS: STRUCTURAL (PDR-S)**

- The following documents to be used for the compilation of the Preliminary Design Reports (Structural).
- Please note that these documents are supplementary to the PW 371 and the Manual for Consulting Structural Engineers and in no way a substitute for the said documents.
- In the case of non-compliance with any of the requirements outlined in the documents the PM 006-6 form will not be signed off.

- 1) PDR-S 01 Front Page
- 2) PDR-S 02 General Index
- 3) PDR-S 03 Guideline (Structural)
- 4) PDR-S 04 Check List

#### **1) PDR-S 01 Front Page**

- This is the standard Front Page to be used for all Preliminary Design Reports: Structural (PDR-S) compiled for the Director: Structural Engineering of this Department.
- This document is user protected with the provision that the Consultant has access only to the highlighted/bracketed text areas to enable him to describe his specific project.
- Provision was also made for the Consultant to enter his Company logo and/or details in the text box below the heading: **Prepared by:**

#### **2) PDR-S 02 General Index**

- The General Index is a typical example of the Table of Content for Preliminary Design Reports: Structural and gives an indication of the paragraphs that should be included in the report.
- Although most of the paragraphs will be applicable for most of the projects the Consultant will still have to adapt it for his specific project.

#### **3) PDR-S 03 Guideline (Structural)**

This document should be used as a guideline for the Consultant to compile his sketch plan documentation. It addresses problems frequently encountered with Sketch Plan submissions and aspects covered under the following heading:

#### **1.0 General**

## **2.0 Documents**

2.1 Sketch Plan submissions comprise of three documents namely:

- Drawings
- Preliminary Design Report (PDR)
- Geotechnical Report
- 

## **3.0 Drawings**

3.2.1 Locality plan

3.2.2 Site layout plan

3.2.3 Architectural drawings

3.2.4 Structural drawings

3.2.5 Semi-workshop drawings

4.0 Preliminary Design Report (PDR)

5.0 Geotechnical Report

## **Problems frequently encountered with sketch plan submissions**

6.0 Foundations

7.0 Surface beds

8.0 Walls

9.0 Slabs

10.0 Columns

11.0 Ring beams

12.0 Roof trusses

13.0 Roof slabs

14.0 Concrete gutters

15.0 Timber beams

16.0 Lintels

17.0 Concrete grades

18.0 Steelwork

## **4) PDR-S 04 Check List**

- The Check List should be completed by the Consultant who is responsible for the structural design work and the compilation of the Preliminary Design Report
- This document is also user protected with the provision that the Consultant has access to the highlighted/bracketed text areas to enable him to describe his specific project
- A hard copy of the Check List, completed and signed by the Consultant Structural Engineer, should be submitted together with the Preliminary Design Report