

 <b>Eskom</b>	<b>Work Instruction</b>	<b>Technology</b>
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Title: **DRAWING CREATION AND  
CHANGE CONTROL OF  
SECONDARY PLANT  
DRAWINGS**

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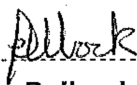
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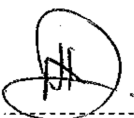
**Compiled by**



**Eddie Dalbock**  
**Chief Draughtsman**

Date: **19-01-2016**

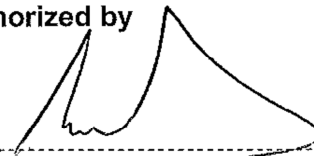
**Functional Responsibility**



**Nombuso Msibi**  
**Application and Drawing  
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Date: **19-01-2016**

**Authorized by**



**Richard McCurrach**  
**PTMC Engineering Senior  
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Date: **19/1/2016**

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## **1. Introduction**

Controlling the flow of drawings and monitoring thereof within the drawing office.

## **2. Supporting clauses**

### **2.1 Scope**

All Transmission secondary plant drawings prepared on CAD and functions within the drawing office, and performed within the TID (MWP) relating to the drawings received.

#### **2.1.1 Purpose**

To establish a process for controlling secondary plant drawings creation and revisions and related support activities of all personnel involved in creating, revising and updating drawings and other drawing office functions.

#### **2.1.2 Applicability**

This document applies to the Power Delivery Engineering Wires Business.

This document shall apply throughout Eskom Holdings Limited Divisions.

## **2.2 Normative/informative references**

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

### **2.2.1 Normative**

- [1] ISO 9001, Quality Management Systems.
- [2] 240-96632721, Drawing Office Standard
- [3] 240-56362378, Transmission PMC Application Guide

### **2.2.2 Informative**

- [4] SABS 0111, Engineering Drawing Part 2
- [5] SABS 0400, National Building Regulations
- [6] SABS 0143, Building Drawing Practice

## **2.3 Definitions**

### **2.3.1 General**

Definition	Description
<b>Directa</b>	The document management system used where all drawings are stored is known as Directa drawing management system.
<b>Drawing</b>	It is visual information related to the equipment on paper or Adobe.
<b>Signed off</b>	A drawing in Directa with a status current, is a completed signed and dated drawing, by the authorised persons.

### 2.3.2 Disclosure classification

**Public domain:** published in any public forum without constraints (either enforced by law, or discretionary).

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

## 2.4 Abbreviations

Abbreviation	Description
CAD	Computer Aided Design
Dgn, Tif, Dwg	Drawing file extensions – MicroStation, Raster, AutoCAD
Directa	Document Management System
DSF	Drawing Submission Form
MWP	Megawatt Park
SPN	Simmerpan
TID	Technical Information & Documentation (MWP)

## 2.5 Roles and responsibilities

The chief draughtsman design is responsible for the flow of the drawings within the drawing office and ensuring that the change management and control of drawings are in accordance with the Drawing Office Standard and this work instruction.

The chief engineer / professional engineer / project engineer manager / engineering applications manager / project engineer / technologist authorising drawings are accountable for the technical content of the drawing.

The senior application designer / application designer is to ensure the correct technical solution is applied to the drawings and includes all relevant plant information, and the drawings are completed on time and with the correct level of accuracy prior to authorisation.

The project engineer is responsible for ensuring the application task and the drawings are completed within reasonable time and project time frame.

The primary / secondary plant manager is accountable for ensuring that the drawings on site are an accurate reflection of the plant, and the latest revision.

The CAD person is responsible for the creation, updating and getting approval of the drawing, and on Directa creates the metadata, revising, checks in/out and signs off the drawing. From the drawing submission form, prints required number, and given to the submitter. The CAD person gives the set of signed prints to the administration clerk.

The drawing office administration clerk submits drawings with a waybill to MWP and completes the documentation that is applicable to this procedure.

## 2.6 Process for monitoring

### 2.6.1 Records

All the relevant fields in the excel spread sheet “DrgProcessYear.xlsx” (Table 1: Table example) are captured from the information on the drawing submission form (Annex B). The submitter retains the signed blue form of the triplicate sheets; the other two forms (white and pink forms) are submitted to the chief draughtsman with the drawings that need a revision. The pink form stays with the drawings throughout the revision cycle, and the white form is archived for duration of four years.

**Table 1:Table example**

Drawing Progress																								
CURRENT										DRAWING OFFICE				CHECK / CORRECT			SIGNATURE			ISSUED/DIRECTA(sign off)				
SUBMITT	DOC	Grk	STATI	TITLE	NUMBE	SHEET	D	P	CCWBS/Orde	DATE SU	DATE RI	NAME	NUMBE	SHEE	DATE	NUMBE	SHEE	DATE	NUMBE	SHEE	DATE	NUMBE	SHEE	DATE

After commissioning marked up drawings are returned within 2 months to the drawing office, the drawings are checked, revised and returned within a 6 month window.

The redlined drawings are kept within the drawing office after the approval of the revised drawings for a period of six months.

The submitter retains a copy of the marked up drawing until such time as the updated revision is returned.

### 2.6.2 Drawing Submission Form Authorisation

All project/standard drawings submitted must have the form (Annex B) attached and must have the signature of the application manager / project engineer / chief engineer or delegated person.

All drawing revisions submitted from a region, with the form (Annex B) attached, must have the signature of the respective areas primary / secondary plant manager or delegated person.

All drawing revisions initiated from the secondary applications section, with the form (Annex B) attached, must have the signature of the respective areas application manager or delegated person.

### 2.6.3 Communication

All communication is done either by electronic mail (current method, Annex A) or a method that's implemented in the drawing office to aid the progress and flow of the drawings, indicating station, drawing number and sheets, and date in progress/completed.

## 2.7 Related/supporting documents

240-71555472, Drawing Creation and Change Control of Secondary Plant Drawings

TRM-FM-00002, Drawing Submission Form

## 3. Document content

### 3.1 New Project Drawings

- 1) The project engineer obtains the schedule from the project leader. The application design is scheduled with an application designer whom is accountable for the application as illustrated on 240-56362378 – Transmission PMC Application Guide.
- 2) The application designer uses the latest revision design scheme standard and marks up the drawings from the information gathered. The application designer submits the new drawings with a completed drawing submission form (white and pink form – Annex B) to the chief draughtsman. The submitter retains the signed blue form.
- 3) The chief draughtsman receives the submitted drawings with the drawing submission form (white and pink form) and captures all relevant information in the drawing excel spread sheet, 2.6.1. The white submission form is filed and the pink form accompanies the drawings. The chief draughtsman schedules the tasks within the drawing office with the responsible CAD person assigned for completing the task. The CAD person / submitter / approver are informed by receiving a mail submission of the start date.
- 4) The assigned CAD person tasked to create the drawings copies the design scheme standard from the drawing management system; these drawings are copied to the users work directory.

- 5) Once the drawings are complete the CAD person creates an Adobe (pdf) file, and if required prints the drawings either A2/A3, then via electronic mail informs all persons mentioned in the mail submission with the pdf attached the drawings are ready for checking. The application designer checks the drawings with the original marked up drawings. If there are any corrections or further mark ups, the work is returned to the CAD person for correction. The electronic mail is updated with dates informing all persons. The drawings must be completed timeously.
- 6) Once the application designer is satisfied with the corrections, and the drawings completed to the Drawing Office Standard, the drawings are sent to the senior application designer / professional technologist for checking. If there are any corrections or further mark ups, the drawings are returned to the application designer, who will return the drawings to the cad person for correction. This flow is followed until the application designer and senior application designer / professional technologist are both satisfied; the drawings are returned to the CAD person by the application designer as the final marked up copy. The electronic mail is updated with dates informing all persons.
- 7) If requested the CAD person can print a set of drawings for approval, the application designer may also use the pdf files if correct, then updating the electronic mail with dates informing all persons. The application designer (checked) and the senior application designer (approved) signs and dates the drawings within the title block.
- 8) The application designer returns the signed and dated drawings to the CAD person. The CAD person adds the names and dates to the electronic drawing file. The number of prints and size requested by the submitter from the drawing submission form are printed. In the drawing management system the CAD person registers the drawings by creating the metadata. The CAD person links the drawings to the metadata created, checks in and signs off the drawings. The CAD person confirms to the chief draughtsman the drawings are signed off within Directa and no longer resident in the work directory of the workstation by submission of the electronic mail, which is updated with dates informing all persons.
- 9) The CAD person gives the signed drawings and the project requested copies to the drawing office administration clerk. The document transmittal form is completed as per the Drawing Registration and Approval Procedure. The drawing excel spread sheet is updated with the latest information. The document transmittal form with signed drawings is sent to TID for further processing, the required number of copies as per the drawing submission form is given to the submitter.
- 10) At TID the microfilms are produced.
- 11) All areas receiving drawings with the document transmittal form must return a signed copy back to the drawing office administration clerk. Drawings issued by hand are signed for on the drawing submission form.
- 12) Drawings submitted to the region for commissioning and require a revision before the commission has taken place need to be returned to the application designer.

### **3.2 Drawing Revisions**

The following applies to:

Drawings from the region having mark ups (maintenance).

Drawings with equipment related changes (project).

Drawings from a region before or after a project are commissioned.

- 1) A completed authorised drawing submission form (Annex B) is submitted with all drawings requiring a revision. The submitter/region - substation retains the signed blue form as well as a copy of the marked up drawings submitted.
- 2) The chief draughtsman receives the submitted drawings with the drawing submission form (white and pink form) and captures all relevant information in the drawing excel spread sheet, 2.6.1. The white submission form is filed and the pink form accompanies the drawings.

- 
- 3) An allocated application designer receives and pre checks the drawings. Any queries regarding these drawings are dealt with the submitter, if need clarity then returned to the submitter, the chief draughtsman is notified. The task requires 2 - 5 working days to pre check the drawings.
  - 4) The chief draughtsman receives the drawings and schedules the task with the responsible CAD person assigned for completing the task. The CAD person / submitter / application designer is informed by receiving the mail submission of the start date.
  - 5) The assigned CAD person within the drawing management system selects the latest signed off (current) drawings and revises the metadata to the next revision, then checks out the drawings to the work directory. The CAD person then commences with the revision. The CAD work should be completed in 5 - 15 working days.
  - 6) Once the drawings are complete the CAD person creates an Adobe (pdf) file, and if required prints the drawings either A2/A3, then via electronic mail informs all persons mentioned in the mail submission with the pdf attached the drawings are ready for checking. The drawings are checked against the original marked up drawings. If there are any corrections or further mark ups, the work will be returned to the CAD person for correction. The drawings need to be completed timeously.
  - 7) Once the senior application designer and application designer are satisfied with the corrections, and the drawings are completed to the Transmission Drawing Office Standard. If requested the CAD person can print an A1/A3 depending on legibility of the drawings for signature the application designer may also use the pdf files, then updating the electronic mail with dates informing all persons. Two different signatures are required, the application designer (checked) and senior application designer (approved) within the title block signs and dates the drawings.
  - 8) The CAD person adds the names and dates on the electronic file of the drawings. The number of prints and size requested by the submitter on the drawing submission form are printed. In the drawing management system the CAD person links the revised drawings to the metadata, checks in and signs off the drawings. The CAD person confirms to the chief draughtsman the drawings are signed off within Directa and no longer resident in the work directory of the workstation by submission of the electronic mail.
  - 9) The CAD person gives the signed drawings and the project requested copies to the drawing office administration clerk. The document transmittal form is completed as per the Drawing Registration and Approval Procedure. The drawing excel spread sheet is updated with the latest information. The document transmittal form with signed drawings are sent to TID for further processing; the required number of copies are given to the drawing office administration clerk for distribution either by courier or hand delivered to the submitter.
  - 10) At TID the microfilms are produced.
  - 11) All areas receiving drawings with the document transmittal form must return a signed copy back to the drawing office administration clerk. Drawings issued by hand are signed for on the drawing submission form.
  - 12) The submitter checks the revised returned drawings with the official mark ups, replaces the correct drawings and returns the incorrect drawings marked up with a drawing submission form to 3.2 above.

### **3.3 Design Drawings**

- 1) The chief engineer / engineer use a design scheme standard and marks up the drawings from the information gathered. The chief engineer / engineer submit the new drawings with a completed drawing submission form (white and pink form - Annex B) to the chief draughtsman. The submitter retains the signed blue form.

- 2) The chief draughtsman receives the submitted drawings with the drawing submission form (white and pink form) and ensures all the relevant information is captured in the drawing excel spread sheet, 2.6.1. The white submission form is filed and the pink form accompanies the drawings. The chief draughtsman schedules all tasks within the drawing office with the responsible CAD person assigned for completing the task. The chief engineer / engineer is informed of the start date and captured in the drawing excel spread sheet.
- 3) The design drawing flow is followed on from 3.1.4 above.

#### **4. Plotting Size**

The international drawing size (A0 – A4) is used for the actual drawing size on the workstation.

All A1 size final design standard drawings that are legible, and of vector format may be printed A3 (420 x 297 mm) for signature.

All A1 size application drawings revised requiring signatures and legible, and of vector format may be printed on A3 for signature, the exception being where the drawings are made up of both vector and raster images, these drawings should be printed an A1 size (841 x 594 mm) for signature.

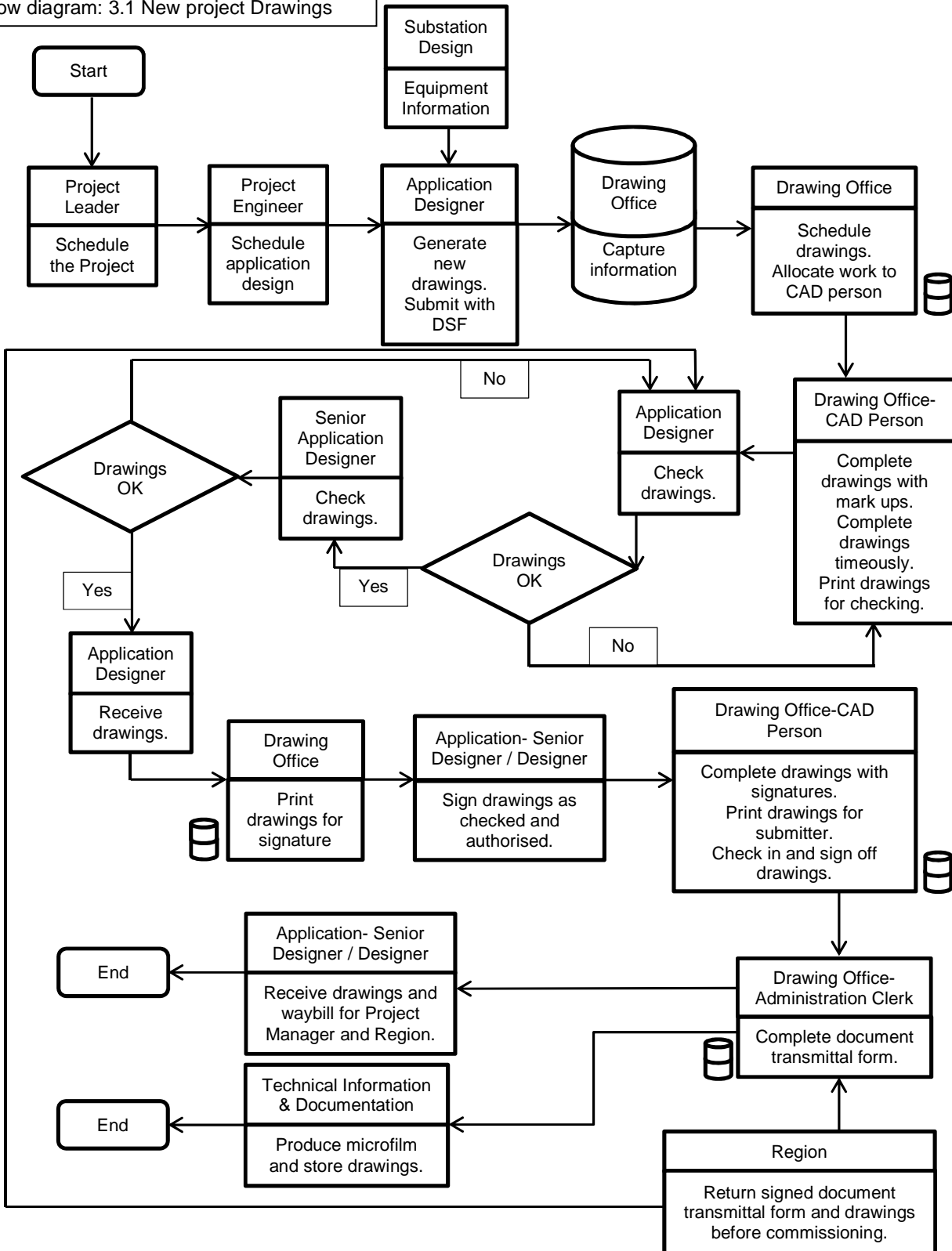
For both cases above if a drawing is an A1 and of vector format, and is illegible, which has been revised and require signatures will be printed on A1 for signature.

All final prints must be signed and dated in BLACK INK and sent to TID (MWP).

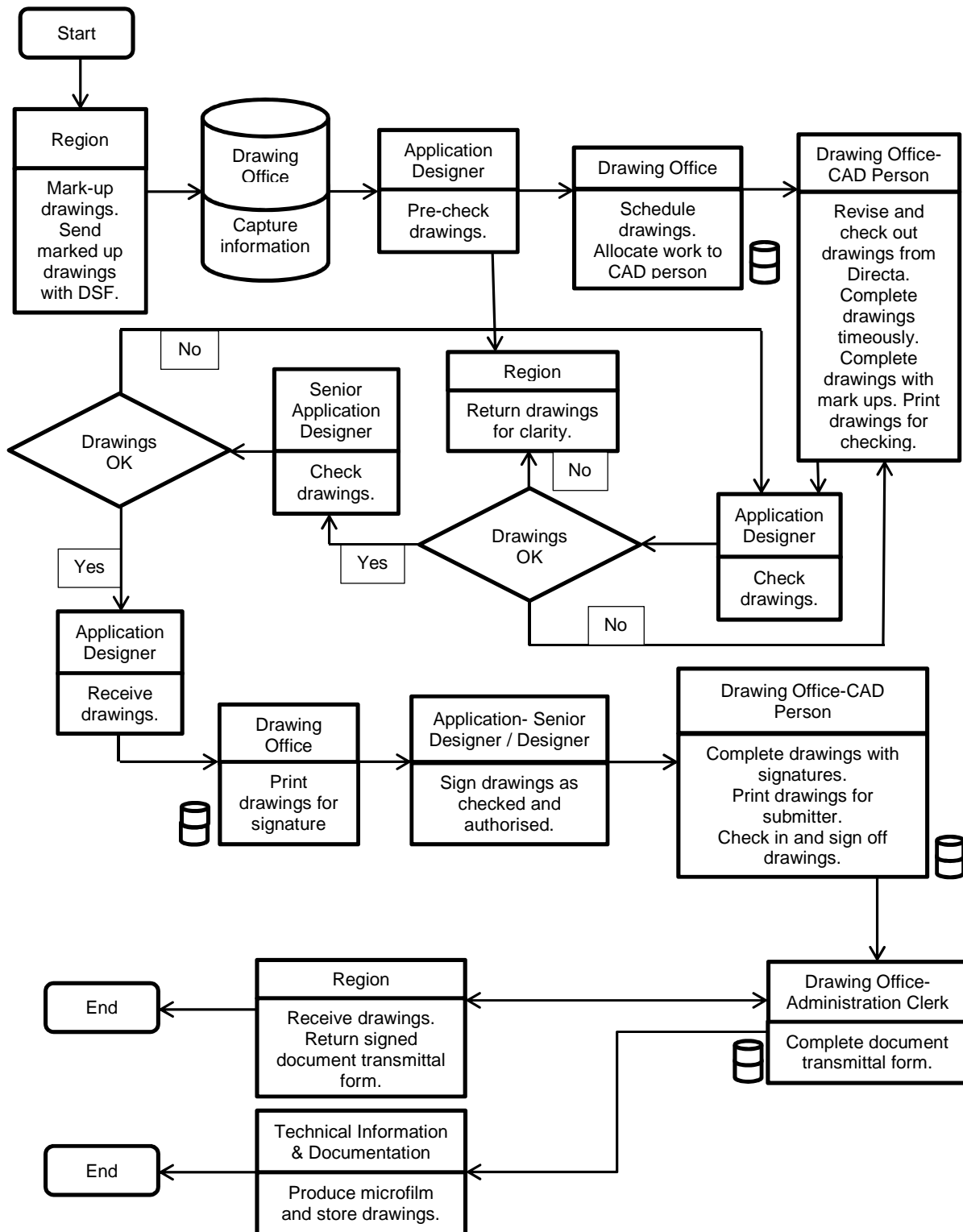
The final print must be signed by the delegated person authorised to sign approval.



Flow diagram: 3.1 New project Drawings



Flow diagram: 3.2 Drawing Revisions



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## **5. Authorization**

This document has been seen and accepted by:

<b>Name and surname</b>	<b>Designation</b>
Simmerpan Drawing Office	All current 11/2015 drawing office personal
Sunninghill Drawing Office	All current 11/2015 drawing office personal
Secondary Plant Managers	All current 11/2015 secondary plant managers
Tony Sheerin	Planning & Support Manager
Philip Groenewald	SGT & Metering DC & Security Technologies Manager

## **6. Revisions**

<b>Date</b>	<b>Rev</b>	<b>Compiler</b>	<b>Remarks</b>
Feb 2016	1	E W Dalbock	Revised and new document number

## **7. Development team**

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

Eddie Dalbock

## **8. Acknowledgements**

Not applicable.

## **Annex A –**

This electronic mail is sent every time the drawings are sent or received with a date update.

-----  
Do not change this format besides adding in the relevant information  
-----

For each action completed send this mail to the *Responsible Person* and Eddie *Dalbock*

### **Application Received**

Date : \*\*/\*\*/\*\*\*\*

Submission Form: \*\*\*\*\*

Project/Order No/Cost Centre: \*\*\*\*\*

Station Name: \*

Title: \*

Drg No.: \*\*/\*\*/\*\*\*\*

Sheets: \*

Drawing format, size and copies required: \*\*\*\*\*

Responsible Person : Names

### **Date Required**

Date : \*\*/\*\*/\*\*\*\*

### **Drawing Office**

#### **Start Date**

Date : \*\*/\*\*/\*\*\*\*

Ready for Checking

Date: \*\*/\*\*/\*\*\*\*

Date: \*\*/\*\*/\*\*\*\*

#### **Received from Checking**

Date: \*\*/\*\*/\*\*\*\*

Date: \*\*/\*\*/\*\*\*\*

#### **Ready for Signature**

Date: \*\*/\*\*/\*\*\*\*

Date: \*\*/\*\*/\*\*\*\*

#### **Received with Signature**

Date: \*\*/\*\*/\*\*\*\*


Date: \*\*/\*\*/\*\*\*\*

#### **Checked in Directa /Submitted for Issue**

Date: \*\*/\*\*/\*\*\*\*

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## Annex B –

	<h2 style="margin: 0;">Drawing Submission Form</h2>	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td colspan="2" style="padding: 2px;">Doc No.</td> </tr> <tr> <td style="padding: 2px;">Serial No. TRM-FM-00002</td> <td style="padding: 2px;">Rev 3</td> </tr> </table>	Doc No.		Serial No. TRM-FM-00002	Rev 3		
Doc No.								
Serial No. TRM-FM-00002	Rev 3							
<b>Submit the marked up drawings to:</b> Power Delivery Engineering Drawing Office Simmerpan Cnr Power & Lake Streets Simmerpan Germiston 1401 Tel 011 871 3521								
<b>Category of drawings submitted</b> (Cross appropriate block) <table style="float: right; margin-left: 20px;"> <tr> <td style="text-align: center;">Maintenance:</td> <td style="text-align: center;">Project</td> <td style="text-align: center;">Audit</td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> </tr> </table>			Maintenance:	Project	Audit	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Maintenance:	Project	Audit						
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>						
Station name:	Cost Center No.:	Project /Job No.:						
<b>Drawing No:</b>	<b>Drawing No:</b>	<b>Drawing No:</b>						
Sheet	Sheet	Sheet						
Sheet	Sheet	Sheet						
Sheet	Sheet	Sheet						
Sheet	Sheet	Sheet						
Sheet	Sheet	Sheet						
Sheet	Sheet	Sheet						
Sheet	Sheet	Sheet						
Sheet	Sheet	Sheet						
Sheet	Sheet	Sheet						
Date required:	Estimated Hours:	Completed CAD Hours:						
<b>Submitted by:</b> (Print and Complete in Full)		<b>Return revised drawings to:</b>						
Name	Name	Name						
Tel/Fax	Tel/Fax	Tel/Fax						
Cell	Cell	Cell						
Email	Email	Email						
Date / /	Address	Address						
Signature	Signature	Signature						
<b>Drawing format, size and copies required:</b> (Indicate type and number required)								
Pdf <input type="checkbox"/>	Hardcopy <input type="checkbox"/>	A3 <input type="checkbox"/> A2 <input type="checkbox"/> A1 <input type="checkbox"/>						
<b>Approval by Line Manager:</b> (Make sure the form is completed in full)								
Signature	Name (PRINT)	Date / /						
<b>NOTE:</b> Submit White and Pink Copy with the marked-up Drawings, Retain Blue Copy.								
<b>Tracking history:</b>								
Drawings Received:	Signature	Name (PRINT)						
		Date / /						
Drawings issued to Submitter:	Signature	Name (PRINT)						
		Date / /						

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