Eskom Generation	**Standard**	

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INTRODUCTION

This standard provides the rules for the production and control of engineering drawing office and engineering documentation.

SECTION A – GENERAL DRAWING STANDARD

1. SCOPE

The document specifies the procedures and standards that must be adhered to while compiling and distributing engineering drawings and associated engineering documentation.

2. PURPOSE

The purpose of the document is to define a procedure that must be followed by the internal Eskom drawing office(s) and Contractor's drawing office staff. The document specifically defines the procedures and standards for an electronic drawing office utilising CAD/3D Draughting Software.

3. APPLICABILITY

This document is applicable to both Eskom and Contractors at all Eskom Generation Division Business Units.

Should any changes to this standard be required, all associated Work Instructions (36-944, 36-945, 36-946 and 36-947) must be updated as well due to the cross-referencing contained in the Standard and these Work Instructions.

4. SUPERSEDED STANDARDS

The following Eskom Generation Standards are superseded by this document.

Document No	Revision	Title
167A/143	00	Drawing Office Practice
GGG 0450	0	Guideline to Acceptance of Contract Drawings
GGS 0182	1	Process Flow Diagrams and Piping Instrumentation Diagrams
GGS 0315	0	Standard Drawing Practice
GGS 0441	0	Drawing Records System
GSE/94/Y004	1	Standard Drawing Practice

5. REFERENCE STANDARDS

This document is to be read in conjunction with the following standards and standard instructions:

Document No	Rev	Title
36-944		General Standard Instruction for General Drawing Software Configuration
36-945	0	Generation Standard Instruction for P&ID Draughting
36-946	0	Generation Standard Instruction for Electrical Draughting
36-947	0	Generation Standard Instruction for Instrumentation Draughting
32-9		Definition of Eskom Documents
EPC0001		Eskom Documentation Management Procedure
36-1	1	Standard for Management System Documents, Correspondence And Records

Document No	Rev	Title
36-2	0	Writing And Controlling Management System Documents.
LIM 103	11	AKZ Identification System
GGS 0445	0	Drawing Number System
GGG 1016		KKS Identification System
OPS 0014	1	KKS Key Parts
GGS 0442	1	Abbreviation Standard for Chemistry related items for power stations
GGS 0443	2	Abbreviation Standard for Labelling of plant at power stations
GGS 0445	1	Drawing Number System
ISO 128: 1982	-	Technical Drawings – General Principles of Presentation
ISO 129 Part I: 2004	-	Technical Drawings - Dimensioning
ISO 406: 1987	-	Technical Drawings – Tolerancing of Linear and Angular Dimensions
ISO 1101: 2004	-	Technical Drawings – Geometrical Tolerancing
ISO 1660: 1996	-	Technical Drawings – Profile Dimensioning
ISO 3040: 1990	-	Technical Drawings – Cone Dimensioning
ISO 3098 Part I: 2000	-	Technical Drawings - Lettering
ISO 5455: 1995	-	Technical Drawings - Scales
ISO 5459: 1981	-	Technical Drawings – Datum Systems for Geometric Tolerancing
ISO 6410 Parts I – III: 1996	-	Technical Drawings – Representation of Threaded Parts
ISO13567		CAD Layering Standards

6. CODIFICATION

6.1 The plant codification must be in accordance with LIM 103 - AKZ Identification System for the following site:

6.1.1 Duvha Power Station
6.1.2 Kriel Power Station
6.1.3 Lethabo Power Station
6.1.4 Matla Power Station

6.2 The plant codification must be in accordance with GGG 1016 - KKS Identification System and OPS 0014 – KKS Key Parts Identification System for the following sites:

6.2.1 Acacia Power Station
6.2.2 Ankerlig Power Station
6.2.3 Arnot Power Station
6.2.4 Camden Power Station
6.2.5 Drakensberg Pumped Storage Scheme
6.2.6 Gariep Power Station
6.2.7 Gourikwa Power Station
6.2.8 Grootvlei Power Station
6.2.9 Hendrina Power Station
6.2.10 Ingula Power Station
6.2.11 Kendal Power Station
6.2.12 Komati Power Station
6.2.13 Majuba Power Station
6.2.14 Matimba Power Station
6.2.15 Medupi Power Station
6.2.16 Palmiet Pump Storage Scheme
6.2.17 Port Rex Power Station

6.2.18 Tutuka Power Station
6.2.19 Vanderkloof Power Station

6.3 The required codification standard for Nuclear Plant is obtainable from the Drawing & Design Office at Koeberg Power Station. The plant codification must be in accordance with nuclear plant requirements for the following sites:

6.3.1 Koeberg Power Station
6.3.2 Pebble Bed Modular Reactor (PBMR)
6.3.3 Future Nuclear Power Stations

6.4 The numbering of drawings shall be done in accordance with GGS 0445 (Generation Drawing Number System Standard). Only Section 4.1.1, 4.1.3 and Annexures A, C, G, H, L, M and R of GGS 0445 shall apply for use with this drawing standard.

7. ABBREVIATIONS

7.1	BCP	-	Business Continuity Plan
7.2	CAD	-	Computer Aided Draughting
7.3	DGN	-	Bentley MicroStation Drawing File Extension
7.4	DRP	-	Disaster Recovery Plan
7.5	DWG/DXF	-	AutoCAD Drawing File Extensions
7.6	EDMS	-	Electronic Document Management System
7.7	HVAC	-	Heating Ventilation Air Conditioning
7.8	IBI	-	Integrated Business Improvement Philosophy/Methodology
7.9	MWP	-	Megawatt Park
7.10	MTBF	-	Mean Time Between Failures
7.11	MTTR	-	Mean Time To Repair
7.12	NCR	-	Non Conformance Report
7.13	NDT	-	Non-Destructive Testing
7.14	OEM	-	Original Equipment Manufacturer
7.15	OHSAct	-	Occupational Health and Safety Act of 1993
7.16	PDF	-	Portable Document Format
7.17	PDB	-	Project Data Base
7.18	P&ID	-	Process & Instrumentation Diagram/Piping & Instrumentation Diagram
7.19	PFD	-	Process Flow Diagram
7.20	PPE	-	Personnel Protective Equipment
7.21	Pr Eng	-	Professional Engineer registered in terms of the Engineering Profession Act, 2000

7.22	RCM	-	Reliability Centred Maintenance
7.23	RFT	-	Request for Tender
7.24	SoW	-	Scope of Work
7.25	TIFF	-	Tagged Image File Format

8. DEFINITIONS

8.1 As Built Drawing: Drawing which is verified as an exact representation of a plant or a section of a plant that has been completely built.

8.2 As Designed Drawing: A drawing which would be published as per the final design for implementation and construction.

8.3 Check Print: Drawing which is printed and utilised for verification of a drawing during the drawing checking procedure.

8.4 Contractor: A party appointed by Eskom to render services.

8.5 Data Mining: For the purposes of this standard *Data Mining* shall be the extraction of Text Tagged data from CAD drawings.

8.6 Controlled Copy: A copy of a document held by a documentation/satellite centre or by a designated individual that has the guarantee that it is the latest and current valid revision. This copy shall be clearly stamped in red “CONTROLLED COPY”. All controlled documents that are printed will be considered valid for a maximum period of 24 hours. Users shall always reference back to the EDMS for the latest version of a document.

8.7 Deviation Process: This process is the initiator of engineering activities to permanently address plant deficiencies or incidents.

8.8 Draughtsperson: A person responsible for the creation and updating of drawings, in accordance with this standard.

8.9 Functional Process Flow Diagram (FPFD): Diagram showing all or a recognisable portion of the process, complete with a material and/or heat balance sheet. It contains details of operating parameters such as flow rate, temperature and pressure.

8.10 Piping and Instrumentation Diagram (P&ID): Diagram which shows limited details of the mechanical and electrical components, pipework and ducting, and identifies all the measuring points and control elements that are necessary to measure and control that process.

8.11 Plant System: A collection of plant components connected in such a way that each will perform a unique process, thereby achieving specified performance parameters.

8.12 Preliminary: When a drawing is authorised but has not been implemented or has not reached ‘As-Built’ status.

8.13 Primary Process Flow Diagram (PPFD): Diagram which indicates the major process as well as the process values through all or most of the main plant items of a given power station or system.

8.14 Project Configuration Files: The customised setup files that must be utilised in conjunction with Bentley PlantSpace P&ID.

8.15 Secondary Process Flow Diagram (SPFD): Secondary process flow diagram is similar to the primary process flow diagram (PPFD), except that it only deals with one particular system or subsystem of plant, and in more detail.

8.16 Text Tagging: For the purposes of this standard Text Tagging shall be the process of adding electronic text tags into a CAD drawing for the purpose of data mining.

9. CAD SOFTWARE REQUIREMENTS

The minimum CAD software requirements are specified below. Additional add-on Bentley software packages can be utilised.

9.1 Bentley MicroStation Version 08.05.02.27

Shall be used for General Arrangement, Sectional Views and Detail Drawings for the following drawing types/disciplines:

- Architectural
- Civil
- Structural
- Mechanical
- Piping
- Lighting
- HVAC
- Electrical
- Text Tagging of existing drawings for data mining

9.2 Bentley Knowledge Manager Version 08.05.0.10

- Shall be used for the mining of Text Tagged Drawings

9.3 Bentley Data Manager Version 08.06.0.79

- Shall be used for the management of equipment data sheets

9.4 Bentley Vision Version 08.06.0.79

This shall be used as the Universal Viewing Interface for:

- PlantSpace P&ID
- Knowledge Manager
- Data Manager

9.5 Bentley I/RAS B 2004 Edition Version 08.05.02.27

This shall be used as the Viewing and Editing Interface for hybrid drawings, eg drawings consisting of a.tif layer and a .dgn layer.

10. DOCUMENTATION

The requirements for specific drawing documents are specified below.

10.1 General Drawings

10.1.1 Draughting of all Drawings, including Text-Tagged Drawings shall be done in accordance with 36-944 (Generation General Drawing Standard Work Instruction). “Intelligent” P&ID’s, Electrical and C&I Drawings will be done in accordance with 10.2, 10.3, 10.4 and 10.5 of this Standard.

10.2 Process Flow Diagrams (PPFD, SPFD and FPFD)

10.2.1 Draughting of PPFD, SPFD and FPFD’s shall be done in accordance with 36-945 (Generation Standard Work Instruction for Process, Hydraulic and Pneumatic Drawings). Configuration of the required CAD Software shall be in accordance with 36-945.

10.2.2 Draughting shall be done using the Standard Eskom Cell Library for Process Diagrams, contained as Annexure "A" in 36-945.

10.3 Piping and Instrumentation Diagrams (P&ID)

10.3.1 Draughting of P&ID's shall be done in accordance with 36-945 (Generation Standard Work Instruction for Process, Hydraulic and Pneumatic Drawings). Configuration of the required CAD Software shall be in accordance with 36-945.

10.3.2 Draughting of P&ID's shall be done using the Standard Eskom Cell Library for Process Diagrams, contained as Annexure "A" in 36-945.

10.3.3 Draughting of Hydraulic and Pneumatic Circuits shall be done using the Standard Eskom Cell Library for Hydraulic and Pneumatic Diagrams, contained as Annexure "B" in 36-945.

10.4 Electrical Diagrams (I&W) Drawings

10.4.1 Draughting of Electrical Diagrams shall be done in accordance with 36-946 (Electrical Drawing and Documentation Standard Work Instruction). Configuration of the required CAD Software shall be in accordance with 36-946.

10.4.2 Draughting will be done using the Standard Eskom Cell Library for Electrical Diagrams, contained as Annexure "C" in 36-946.

10.4.3 For "Ladder Diagrams", Draughting shall be done using the Standard Eskom Cell Library for Ladder Diagrams, contained as Annexure "D" in 36-946.

10.5 Instrumentation Diagrams

10.5.1 Draughting of Instrumentation Diagrams shall be done in accordance with 36-947 (Instrumentation Drawing and Documentation Standard Work Instruction). Configuration of the required CAD Software shall be in accordance with 36-947.

10.5.2 Draughting will be done using the Standard Eskom Cell Library for Instrumentation Diagrams, contained as Appendix "K" in 36-947.

11. CLASSIFICATION OF DRAWINGS

11.1 Drawings shall be classified according to at least the following information classification levels:

- **Level 1**
  Secret: Only for use within specified segments in the organisation
- **Level 2**
  Confidential: May not be disclosed outside of Eskom – represents a competitive advantage for the business.
- **Level 3**
  Controlled Disclosure: Internal Information – controlled disclosure to any external parties – either enforced by law or discretionary
- **Level 4**
  Public Domain/Non-Classified: Published in any public forum without constraints, either enforced by law or discretionary

11.2 This classification shall form part of the document record in the EDMS/Engineering Management System and user access to the drawing(s) will be restricted accordingly.

12. DRAWING WORK FLOW

12.1 The issuing, updating and creating of drawings must be in accordance with the Drawing Work Flow which is included in this document as Annexure “A”.

13. REQUESTING OF DRAWINGS

13.1 Copies of existing drawings must be requested in writing by submitting a completed standard drawing requisition form to the Eskom Drawing Office Document Controller.

13.2 All requests for drawings shall form part of a request for Technical Information Change (TIC). A deviation must be registered by the designated Eskom Drawing Office Document Controller or EDMS Administrator prior to drawings being issued to any party.

13.3 Should any drawing be required by a Contractor or third party the Eskom Non-Disclosure Agreement form must be signed off by the Contractor or third party and sent to the designated Eskom Drawing Office Document Controller prior to the drawing being issued.

13.4 An example of the minimum content for non-disclosure form/agreement is attached as Annexure “I”.

13.5 The standard format for a drawing requisition is attached as Annexure “B”.

14. ISSUING OF DRAWINGS BY ESKOM

14.1 All drawings issued by Eskom must be issued by the designated Eskom Drawing Office Document Controller via a document transmittal and signed by the applicable authoriser.

14.2 The recipient of the drawings must acknowledge receipt of the drawings by signing the document transmittal and returning the signed transmittal to the designated Eskom Drawing Office Document Controller.

14.3 The recommended format for a document transmittal is attached as Annexure “C”.

15. ISSUING OF NEW DRAWING NUMBERS

15.1 Drawings numbers must be requested in writing by submitting a completed standard drawing requisition form Annexure “B” to the designated Eskom Drawing Office Document Controller.

15.2 The recommended format for a drawing requisition is attached as Annexure “B”.

16. UPDATING AND CREATING OF DRAWINGS

16.1 General Drawings must be created and updated in accordance with 36-944 (Generation General Drawings Standard Work Instruction).

16.2 Text Tagged Drawings for data mining must be created and updated in accordance with 36-944 (Generation General Drawings Standard Work Instruction).

16.3 Draughting of PPFD, SPFD, FPFD and P&ID’s shall be done in accordance with 36-945 (Generation Standard Work Instruction for Process, Hydraulic and Pneumatic Drawings). Configuration of the required CAD Software shall be in accordance with 36-945. Draughting shall be done using the Standard Eskom Cell Library for Process Diagrams, contained as an Annexure “A” in 36-945. Draughting of Hydraulic and Pneumatic Circuits shall be done using the Standard Eskom Cell Library for Hydraulic and Pneumatic Diagrams, contained as an Annexure “B” in 36-945.

16.4 Draughting of Electrical Diagrams shall be done in accordance with 36-946 (Generation Standard Work Instruction for Electrical Drawings). Configuration of the required CAD Software shall be in accordance with 36-946. Draughting will be done using the Standard Eskom Cell Library for Electrical Diagrams, contained as an Annexure "A" in 36-946. For "Ladder Diagrams", Draughting shall be done using the Standard Eskom Cell Library for Ladder Diagrams, contained as an Annexure "B" in 36-946.

16.5 Draughting of Instrumentation Diagrams shall be done in accordance with 36-947 (Generation Standard Work Instruction for Instrumentation Drawings and Documentation). Configuration of the required CAD Software shall be in accordance with 36-947. Draughting will be done using the Standard Eskom Cell Library for Instrumentation Diagrams, contained as Annexure "K" in 36-947.

16.3 The following best practice shall be applied in the creation of drawings:

- Drawings shall be properly planned and produced to ensure ease of interpretation and read-ability.
- Typical details are not to be duplicated, appropriate references shall be used in the main drawing to indicate repetition of any typical details (**Except** for P&ID's – see last point in this list).
- The use of unnecessary views shall be eliminated.
- Application of a constant set of scales on sets of drawings.
- Avoidance of odd scales, using the most common scales like 1:50, 1:20, 1:10, 1:2, etc
- Provision of cross-reference information shall be provided on drawings, ie reference to other drawings as well as to design information/manuals as appropriate.
- Manufacturer's information and datasheets shall be provided in a MicroSoft MSExcel or MSAccess format that is year 2000 compliant. The display of this information on drawings shall be minimised as far as possible.
- The use of standard symbols for P&ID's, PFD's, Hydraulic, Pneumatic, Electrical and Control & Instrumentation drawings as indicated in this document. These symbols are contained in the relevant Cell Libraries to be used within the Bentley MicroStation and Related Software.
- As P&ID's will be used to generate the plant configuration data-set for the power station in question, they will be appropriately replicated to cater for the number of installed units, systems, sub-systems and duplicate components at the power station. The use of "Typical Drawings" **shall not be allowed**, ie one P&ID for Units 1 to 6.

17. DRAWING CHECKING PROCEDURE

The following auditable procedure must be followed to check all drawings:

17.1 Once the draughtsperson has completed a drawing a check print must be issued to the responsible engineer or draughtsperson. The check print must be clearly stamped "CHECK PRINT".

17.2 The responsible engineer or draughtsperson must check the drawing:

- against the relevant marked up drawing
- with the plant configuration/codification officer to ensure that all tagged items comply with the KKS or AKZ site codification system as required

17.3 The check by the responsible draughtsperson is performed to ensure that the drawing standards are adhered to and that all the marked-up items have been incorporated as required.

17.4 A standard checklist for drawings that must be used as a basis for checking that the drawing standards are adhered to is attached as Annexure "H".

17.5 The check by the responsible engineer is to ensure that the design changes are incorporated as required.

17.6 Once the responsible engineer or draughtsperson has completed checking a drawing the check print must be signed and dated and the full name of the checker must be recorded on the drawing.

17.7 The drawings must then be returned to the responsible draughtsperson. All discrepancies or queries must be clearly marked up utilising the following colour code system and reviewed with the responsible draughtsperson.

- Red - Corrections
- Yellow - Delete
- Blue - Comments (will not be draughted)
- Green - Correct

17.8 The draughtsperson must back draught the "CHECK PRINT" drawing and re-issue the drawing to the responsible engineer or draughtsperson as a revised "CHECK PRINT" for re-checking. Once no more discrepancies are marked up on the "CHECK PRINT" by the responsible engineer or draughtsperson and he/she has signed off the drawing the drawing is ready for issue to Eskom for the required approvals.

17.9 Note all superseded paper copies of all drawings must be clearly stamped "SUPERSEDED" by the responsible draughtsperson as soon as the corrections have been made.

17.10 All "SUPERSEDED" drawings must be retained as part of the drawing office records.

17.11 If required the drawing must be issued to Eskom for checking in accordance with Clause A.19.0.

17.12 Each drawing issued to Eskom for checking must be issued together with a NCR which specifies all outstanding issues relating to the drawing that must be resolved by Eskom. NCR's must be created for all drawings whether or not they have outstanding issues.

17.13 Each drawing issued to Eskom for checking must be clearly stamped "CHECK PRINT".

17.14 Eskom must appoint a responsible engineer or draughtsperson to check the drawing and resolve all the items listed on the NCR.

17.15 Once the Eskom responsible engineer or draughtsperson has completed checking a drawing the check print must be signed and dated and the full name of the checker must be recorded on the drawing.

17.16 The drawing must then be returned to the responsible draughtsperson or Contractor. All discrepancies or queries must be clearly marked up utilising the following colour code system and reviewed with the responsible draughtsperson.

- Red Corrections
- Yellow Delete
- Blue Comments (will not be draughted)
- Green Correct

17.17 If required the drawing must be issued to the Contractor for updating/back-draughting in accordance with Clause A.14.0.

17.18 Once a checked drawing is received from Eskom the responsible draughtsperson will review any non conformances marked up on the drawing or recorded on the NCR with Eskom if required and revise the drawing accordingly.

17.19 The drawing must then be re-checked in accordance with this procedure.

17.20 Once all the drawing's non conformances marked up on the drawing or recorded on the NCR have been resolved by Eskom the drawing will be checked reviewed, authorised and approved in accordance with the applicable workflow stipulated in Annexure "A".

18. NON CONFORMANCE REPORTING (NCR)

18.1 The following types of non conformances must be recorded on a NCR:

- Missing or unclear Plant Configuration (tagging) information, text or plant codes
- Information missing from the drawing that cannot be clarified by the draughtsperson or Contractor
- Items that cannot be clearly marked up on the “CHECK PRINT”

18.2 Each check print from the Contractor or person approving the drawing must be accompanied by a NCR which specifies all outstanding issues relating to the drawing that must be resolved by the Eskom Drawing Office. NCR’s must be created for all drawings whether or not they have outstanding issues.

18.3 The recommended format for a non conformance report is attached as Annexure “D”.

19. ISSUING OF DRAWINGS TO ESKOM

19.1 All drawings issued to Eskom must be issued to the designated Eskom Drawing Office Document Controller via a document transmittal.

19.2 The designated Eskom Drawing Office Document Controller must acknowledge receipt of the drawings by signing the document transmittal and returning the signed transmittal to the Contractor.

19.3 The recommended format for a document transmittal is attached as Annexure “C”.

20. ELECTRONIC FORMAT OF DRAWINGS ISSUED TO ESKOM

20.1 All drawings must be issued to Eskom in electronic MicroStation (.DGN) format. No drawings in TIFF, PDF or any other electronic format will be accepted.

20.2 Drawings issued to Eskom may not be “Write Protected” or encrypted as Eskom has to do the necessary configuration management on these documents upon receipt.

21. PAPER FORMAT OF DRAWINGS ISSUED TO ESKOM

21.1 All printed drawings must be printed utilising the standard Eskom.plt MicroStation plot driver file which must be installed in accordance with 36-944.

21.2 All paper drawings must be clearly printed on a minimum of 80g/m² bond paper.

21.3 All drawings issued to Eskom in paper format must comply to the following paper sizes:

	Paper Size [mm]	**Useable Size [mm]**
A0	1189 x 841	1154 x 830
A1	841 x 594	830 x 559
A2	594 x 420	583 x 385
A3	420 x 297	409 x 262
A4	297 x 210	286 x 175

21.4 The useable size defines the extent of the available print area. Drawings content should be contained within this useable size to ensure full print of drawing content.

21.5 The standard Title Block files referred to in "SECTION B" and in 36-944 have been setup in accordance with the useable sizes.

21.6 The standard *seed* file setup described in 36-944 defines the paper size to be utilised when inserting scanned images into a CAD drawing.

21.7 The recommended sheet sizes for the different drawing types are as follows:

Documentation Type	Drawing Size
Process Drawings	
Piping & Instrumentation Diagrams (P&ID's)	A1 or A0
Process Flow Diagrams	A1
Metering, Control and Instrumentation	
Instrument Schedules	A4
Instrument & Loop Lists	A4
Instrument Datasheets	A4
Instrument Hook-up Diagrams	A4
Loop Diagrams/Drawings	A4
Panel Wiring Diagrams	A1/A4
Cable Schedules	A1/A4
Cable Block Diagrams	A1
Cable Interconnection Diagrams	A1
Datasheets/Specification Sheets	A4
PLC Schematics	A1/A4
Software Documentation	
Plant I/O (input/output) Schedules	A4
Flow Charts	A4
Software Listings	A4
Trip/Alarm Schedules	A4
Ladder Logic Diagrams	A1/A4
Electrical Documentation	
Single Line Diagrams	A1/A4
Electrical Schematic Diagrams	A1
Electrical Wiring Diagrams	A1
Cable Schedules	A1/A4
Cable Block Diagrams	A1
Cable Interconnection Diagrams	A1
Power Distribution Diagrams	A1/A4
Earthing Diagrams	A1/A4
Load Lists	A4

22. REGISTRATION OF DRAWINGS

22.1 All drawings must be registered by Eskom on the EDMS.

22.2 Contractors shall maintain an internal Drawing Register which records at least the following information:

- Eskom Drawing Number
- Eskom Deviation Number
- Drawing Title
- Contractor Drawing Number
- Contractor Revision Number
- Eskom Revision Number

22.3 The Contractors drawing register must be made available to Eskom for audit on request.

23. REVISION CONTROL

23.1 Preliminary drawing revision numbers

23.1.1 Once a deviation has been registered, a preliminary drawing can be registered by Eskom Document Controller in accordance with the Eskom EDMS requirements.

23.1.2 Eskom preliminary revision numbers cannot be created or changed by Contractors.

23.1.3 When a preliminary drawing is first registered the revision number shall be “A”

23.1.4 Each revision of the drawing shall increase the alpha numeric revision number sequentially.

A
B
C etc…

23.1.5 When a drawing has an Eskom revision number (e.g. revision 2) the revision number shall be the current Eskom revision number followed by a sequential alpha numeric revision number (e.g. ‘2A’).

23.1.6 Each revision of the drawing shall increase the revision number sequentially.

2A
2B
2C etc…

23.2 Drawing revision numbers

23.2.1 The Eskom revision number may only be revised by the designated Eskom Document Controller once a deviation has been registered and closed out in accordance with the Eskom EDMS requirements.

23.2.2 Eskom revision numbers cannot be created or changed by Contractors.

23.2.3 Each revision of the drawing shall increase the revision number sequentially.

0
1
2 etc…

23.3 Revision information to be recorded in the Eskom section of the Title Block

23.3.1 The following information must be completed each time a drawing is revised by Eskom:

- Accredited drawing office abbreviation
- Revision number
- Date of revision
- Short description of the revision
- Draughtsperson’s initials
- Checker’s initials
- Authoriser’s initials
- Approver’s initials
- Codification approver’s initials

23.4 Revision information to be recorded in the Contractor section of the Title Block

23.4.1 The following information must be completed each time a drawing is revised by a Contractor:

- Revision number
- Date of revision
- Short description of the revision
- Draughtsperson's initials
- Designated Checker's initials
- Authoriser's initials
- Approver's initials
- Reference Drawings

24. CONTRACTOR INFORMATION BACKUP

24.1 The Contractor must ensure that all drawing data is backed up on a regular basis.

24.2 The Contractor must advise Eskom which back up methodology will be utilised and this back up methodology must be approved by Eskom.

24.3 The maximum period between backups must not exceed 24 hours.

24.4 The backups must be carried out utilising an offsite rotating backup system to ensure that data-loss is minimal should there be theft or equipment damage at Contractor's site.

SECTION B - CUSTOMISED CAD FILES

1. INSTALLATION OF CUSTOMISED CAD FILES FOR ALL DRAWINGS

1.1 Installation of the required customised Bentley MicroStation CAD files shall be done in accordance with 36-944.

2. INSTALLATION OF CUSTOMISED CAD FILES FOR P&ID's AND PFD's

2.1 In addition to the files specified in Clause B1.0, the additional required software configuration shall be done in accordance with 36-945 prior to commencing with draughting of P&ID's and PFD's in accordance with this standard.

3. INSTALLATION OF CUSTOMISED CAD FILES AND CELL LIBRARIES FOR ELECTRICAL, DIAGRAMS/ DRAWINGS AND LADDER DIAGRAMS

In addition to the files specified in Clause B1.0, the following additional Cell Libraries must be loaded into the configuration set-up:

3.1 For Electrical Drawings, the Eskom Standard Symbol Cell Library must be used, ie "Elect01.cel". The latest version of this cell library is obtainable from EED-Drawing Office. Users may not make any changes to the standard cell library. Should additional symbols be required, the EED-Drawing Office should be notified and a formal request registered using the form in Annexure "B" to have the symbols added. Symbols in this cell library are depicted as an Annexure "A" in 36-946.

3.2 For Ladder Diagrams (Ladder Logic Diagrams), the Standard Symbol Cell Library must be used, ie "Ladder.Cel". The latest version of this cell library is obtainable from EED-Drawing Office. Users may not make any changes to the standard cell library. Should additional symbols be required, the EED-Drawing Office should be notified and a formal request registered using the form in Annexure "B" to have the symbols added. Symbols in this cell library are depicted as an Annexure "B" in GWN1534.

4. INSTALLATION OF CUSTOMISED CAD FILES AND CELL LIBRARIES FOR CONTROL AND INSTRUMENTATION DIAGRAMS/ DRAWINGS

4.1 In addition to the files specified in Clause B1.0, the additional C&I Cell Libraries must be loaded into the configuration set-up.

4.2 For Control & Instrumentation Diagrams, the Standard Symbol Cell Library must be used, ie "CandI.Cel". The latest version of this cell library is obtainable from EED-rawing Office. Users may not make any changes to the standard cell library. Should additional symbols be required, the EED-Drawing Office should be notified and a formal request registered using the form in Annexure "B" to have the symbols added. Symbols in this cell library are depicted in Annexure "A" of 36-947.

5. INSTALLATION OF CUSTOMISED CAD FILES AND CELL LIBRARIES FOR HYDRAULIC AND PNEUMATIC DIAGRAMS/ DRAWINGS

5.1 In addition to the files specified in Clause B1.0, the additional Hydraulic/Pneumatic Cell Libraries must be loaded into the configuration set-up.

5.2 For Hydraulic and Pneumatic drawings/diagrams, the Standard Symbol Cell Library must be used, ie "Hydraulic.Cel". The latest version of this cell library is obtainable from EED-Drawing Office. Users may not make any changes to the standard cell library. Should additional symbols be required, the EED-Drawing Office should be notified and a formal request registered using the form in "Annexure B" to have the symbols added. Symbols in this cell library are depicted in Appendix B of 36-945.

SECTION C - ASSOCIATED ENGINEERING PROCESS INFORMATION/ DOCUMENTATION STANDARDS

Where engineering methodology is applied for plant optimisation/management; or additional data/ information is generated that is relevant to the plant, appropriate steps shall be taken to capture this information in a format that will ensure that the information can be linked to the plant in question. To this effect, the following general requirements shall apply:

1. RELIABILITY CENTERED MAINTENANCE (RCM)

Where an RCM exercise is undertaken on the plant, the following information shall be captured in an appropriate, year 2000 compliant format that is MicroSoft compatible (at least contained in, or exportable to MS Access/MS Excel):

1.1 History analysis of the plant in question

- 1.1.1 Equipment Being Analysed (AKZ/KKS Numbers for the Plant being analysed)
- 1.1.2 No of failures
- 1.1.3 Type of Failures
- 1.1.4 MTTR (Mean-Time-to-Repair) and MTBF (Mean-Time-Between-Failures)
- 1.1.5 Root Cause Analysis
- 1.1.6 IBI Barrier Failure Analysis
- 1.1.7 Reliability

1.2 Plant parameters

- 1.2.1 Plant design philosophy
- 1.2.2 Equipment performance Characteristics
- 1.2.3 Equipment Functional Analysis
- 1.2.4 Equipment Criticality Rating

1.3 Failure probability analysis and findings

1.4 Failure consequence analysis

- 1.4.1 Failure Modes
- 1.4.2 Failure Effects
- 1.4.3 Downtime – Scope and type of downtime
- 1.4.4 Consequences of the Downtime (Economic, Production, Safety & Other)

1.5 Maintenance Tasks

- 1.5.1 Tasks Identified
- 1.5.2 Task Execution Frequency
- 1.5.3 Plant State requirements for Execution (on-line, shutdown, outage, etc)
- 1.5.4 Need for Spares/Stockholding (Quantities, type, etc)
- 1.5.5 Responsibility/Accountability for Tasks

1.6 RCM Analysis Review & Sign-off documentation

The above information shall be captured, as far as practically possible, down to component level, with the relevant KKS/AKZ plant code clearly indicated.

2. HAZOP ANALYSIS

Where a HAZOP Analysis exercise is undertaken on the plant, the following information shall be captured in an appropriate, year 2000 compliant format that is MicroSoft compatible (contained in; or exportable to MSAccess/MSExcel):

2.1 Plant Area and Equipment Analysed (AKZ and/or KKS Numbers listed)

2.2 Hazards Identified
- 2.2.1 Safety Hazards
- 2.2.2 Environmental Hazards
- 2.2.3 Health Hazards
- 2.2.4 Operability Problems

2.3 Design Review given the Hazards identified

2.4 Risk Mitigation Strategies for the Hazards

2.5 Risk Mitigation Responsibility/Accountability

2.6 HAZOP Analysis Review & Sign-off documentation

The above information shall be captured, as far as practically possible, down to component level, with the relevant KKS/AKZ plant code clearly indicated.

3. SPECIFICATION FOR TECHNICAL DOCUMENTS

The following specifications shall apply for all engineering technical documents submitted as part of engineering projects:

3.1 All Technical documents and the Document Register shall be provided in electronic format to the Project Manager/relevant System Engineer for the plant in question. The number of electronic copies required will be stated in the NEC/Project Scope of Work (SoW); as well as the need for any documentation to be supplied in hardcopy format (eg Manuals). The format shall be in the MS Office Suite of software format and shall be supplied on CD/DVD ROM format.

3.2 Vendors/Contractors shall generate a Document Register listing all documents that will be submitted during and/or on completion of the project SoW. This Register shall show, *as a minimum*:

- 3.2.1 Title of the Document
- 3.2.2 Vendor/Contractor Document Number
- 3.2.3 Eskom Unique Document Number (if required and/or pre-generated, this will be issued as part of the “Request for Tender” (RFT) documentation).
- 3.2.4 Document Category (ie Drawing, Manual, etc)
- 3.2.5 Document Sub-Category (ie Datasheet, Electrical Block Diagram, Ladder Diagram, Installation Manual, Training Manual etc)
- 3.2.6 Submission Due Date (as per Contract requirements)
- 3.2.7 Revision Number of the Document
- 3.2.8 Status of the document (ie Draft, Issued for construction, As-built, etc)
- 3.2.9 Document Approval Date
- 3.2.10 Transmittal Number
- 3.2.11 Distributed To/By
- 3.2.12 Deviation/Contract Number
- 3.2.13 Classification
- 3.2.14 Discipline
- 3.2.15 Impact Classification
- 3.2.16 Actions

3.2.17 Plant Reference

- Plant Location
- Plant Area
- System/Sub-system
- Equipment
- Plant AKZ/KKS Code(s)

3.3 The Document Register shall be kept up to date by the EDMS Administrator at all times, and revision changes to documentation communicated to the relevant Project Manager on at least a monthly basis.

3.4 A Transmittal Note (Annexure “C”) shall be used to submit documents to Eskom Generation, and must clearly state the purpose of the submission.

3.5 Where a document generated makes reference to plant systems, sub-systems and/or specific components, the relevant plant AKZ/KKS Code shall be added to the document at the point of reference. These codes will be supplied by the plant codification officer (as per AKZ/KKS standards referred to in Section A, Point 6 of this standard).

3.6 Databases supplied as part of the contract/project documentation scope (eg a database containing datasheet information) shall as a minimum be presented in MSAccess compatible format on CD/DVD ROM format, unless otherwise specified in the Contract SoW.

3.7 Spreadsheets shall be presented in MSExcel or MSOffice compatible format on CD/DVD ROM Format.

3.8 For each project, the Vendor/Contractor shall supply a separate and complete set of documents (referred to as “Manuals”) containing:

3.8.1 Installation Instructions
3.8.2 Maintenance and Operating Instructions
3.8.3 Training Materials/Manuals

Where a large project is dealt with, consisting of groups of plant, systems or equipment, the above documents shall be submitted for each plant, system, sub-system and equipment.

3.9 Initial submission of the documentation in 3.8 shall be made as specified in 3.2.6 of this document. The necessary errors and deficiencies shall be rectified by the Vendor/Contractor after review by the appointed Project Manager/System Engineer. The final submission shall be made after all required data has been gathered, but shall not be later than 4 (four) weeks prior to commencement of installation of plant/equipment/ component(s).

3.10 The following General Requirements shall be met with the supply of Manuals (referred to in 3.8):

3.10.1 Installation, Maintenance and Operating Instructions shall be supplied as manuals in 2-D or 4-D Ring Binders. The 4-D Ring Binder shall always be used if the document contains more than 100 pages.
3.10.2 In all instances binders shall have spine sheets and a front overlay insert.
3.10.3 Coloured Dividers shall separate each section of the manual and shall be manufactured from plastic and marked numerically to correspond with the index in the front of the manual in question.
3.10.4 Each section of the manual shall be sub-divided and indexed to facilitate quick referencing.
3.10.5 Drawings used/included in the manual shall be A4 or A3 size, unless larger size is warranted for reasons of clarity. Drawings shall be able to be folded out without removal from the manual.
3.10.6 Drawings and charts larger than A3 size shall be folded and enclosed in a plastic pocket of A4 size of adequate strength.

3.10.7 Brochures used for equipment shall be furnished in their original format, photocopies will not be allowed. Where a general brochure is applicable to a range of equipment, the component description in the manual(s) will make reference to the catalogue and/or model number that is applicable for it.

3.11 For Installation Instruction Manuals, the following is minimum content requirements:

3.11.1 Index listing of the contents of all volumes relevant to the installation.

3.11.2 Contact Personnel: Technical personnel who have knowledge and expertise on the installation of the equipment in question. This shall include contact information for the Main Contractor/Supplier as well as any Sub-Contractor(s)/Supplier(s) used.

3.11.3 Health and Safety Precautions: Compliance to Electrical Machinery Regulations and the OHSAct. Any other Safety Precautions and any personnel health related precautions to be taken when installing/commissioning the plant. Also to be included are any special PPE (Personnel Protective Equipment) that may be required to execute tasks or activities.

3.11.4 Installation Instructions, typically:

- Storage of components prior to installation, as well as for extended outage periods
- Lifting points and weights of components, including crane, hoist and other lifting/rigging requirements. Critical lifting points to be clearly noted.
- Complete erection/installation sequence details.
- Detailed installation drawings
- Details of specialised labour required for the installation.
- Details of corrosion/erosion protection used and the method(s) of repair/ recoating.
- Warning of practices or incorrect installation procedures likely to cause damage to equipment during erection, installation and/or maintenance.
- Lubrication details, removal of plugs in ports, etc.
- Decommissioning details, and disposal of equipment and any hazardous components/consumables

3.12 For Operating and Maintenance Manuals, the following are minimum content requirements:

3.12.1 Index listing of the contents of all volumes relevant to the installation.

3.12.2 Contact Personnel: Technical personnel who have knowledge and expertise on the installation, operation and maintenance of the equipment in question. This shall include contact information for both the Main Contractor/Supplier as well as any Sub-Contractor(s)/Supplier(s) used.

3.12.3 General description of plant operation to provide the Operator with an overview of plant operations, main performance characteristics, limitations, etc.

3.12.3 Health and Safety Precautions: Compliance of Isolation Procedures to the OHSAct and Occupational Health and Safety in Industrial Premises, Statute No 48173. Provision of a list of any special PPE (Personnel Protective Equipment) that may be required to safely execute operating tasks or activities in the plant.

3.12.4 Detailed, step-by-step instructions to start and operate plant under all conditions, and shall typically include:

- Pre-Commissioning and Commissioning Check Sheet(s)
- Commissioning and Start-up Procedures
- Safe working procedures for the Operator
- Performance Specification for the plant (Operating Parameters, Limits, Capacity, Settings)
- Process Flow Diagrams (PFD's)
- Fault diagnosis and instructions and Trouble shooting reference list
- Emergency Shut-Down Procedures
- Alarm/Trip Response Procedures
- Special Operating Procedures for Abnormal Conditions (Emergency Shut-down, standby, manual modes of operation)
- Disposable instructions for consumable items (hazardous, chemical and other)

3.12.5 Detailed, step-by-step instructions to maintain plant under all conditions, and shall typically include:

- Applicable Isolation Procedures
- Details of operating parameters, limits, tolerances, capacity, settings

- Fault Diagnosis and Trouble Shooting
- General Arrangement drawings of the plant with appropriate dimensions of plant, interfaces, clearances for removal etc
- Process & Instrumentation Diagrams (P&ID's)
- Electrical Wiring, and Schematic Diagrams
- Hydraulic & Pneumatic Schematic Diagrams
- Piping & Instrumentation Diagrams
- Equipment Supplier Brochures, Manuals and documentation
- Protection relay settings & co-ordination
- Instrumentation Documentation and Control System document deliverables (where required, also copies of the software and PLC Program on CD/DVD ROM format)
- Maintenance Activity List (Task, Frequency, Standard Average Duration for Task, Drawings relevant, Special and standard Tools required, spare parts/components required, etc)
- Lubrication Schedule for the Plant. This schedule shall be accompanied by a lubrication chart/diagram showing location of all lubrication points and filters referred to in the schedule.

3.12.6 A list of Commissioning Spares

- A list of recommended Spare Parts, sufficient to cover at least 2 years operation requirements post-commissioning.

3.12.7 Quality Control Documents

- Conformity Certificates
- Pressure Test Certificates
- Other Test Certificates (eg NDT tests)
- Test Curves and Certificates
- Factory Test Certificates
- Site Acceptance Test Certificates
- Equipment Warranties

3.12.7 Index of Drawings: A Master Reference list to ALL drawings relevant to the plant. Drawings not included in the manual shall be indicated as such in the index. An electronic copy of all drawings shall be made available to the Project Manager, in CD/DVD ROM Format and shall be in accordance with the required Standards as indicated in this document.

3.12.8 Suppliers Spares Lists and Catalogues: A complete list of spares available from the OEM (Original Equipment Manufacturer) as well as any manufacturer's information relevant to the plant (pamphlets, data or specification sheets). Spares deemed to be critical to continued plant operation/maintenance strategy (eg spares with long lead times), should be indicated as such on the Spares List.

3.13 For Training Material/Manuals, the following is minimum content requirements:

3.13.1 Training material shall be supplied in software compatible with MS Windows/Office and shall be Year 2000 compliant.

3.13.2 The training material shall be sufficiently detailed to train the Employer's personnel in all aspects of the plant operations and maintenance.

3.13.3 Training shall be outcome based and competency evaluations will be performed to establish the level of competency upon completion of the training. Guidelines as to the evaluation criteria will be a joint responsibility between the Project Manager/Employer and the Supplier/Vendor.

3.13.4 A Training Programme shall be provided that will indicate the expected training duration for each of the different disciplines, ie mechanical, electrical, C&I, automation and operations/production.

3.13.5 Employees in Operating and Production Departments shall be trained in the theory and practice of how to operate the equipment safely.

3.13.6 Maintenance personnel shall be trained in the safe maintenance and faultfinding of equipment, the interpretation of electrical, hydraulic, pneumatic and other diagrams and the content of the maintenance manuals (maintenance safe working procedures)

3.13.7 Where PLC equipment forms part of the Scope of Supply, a complete Level 1 PLC training set of documentation shall be provided that will include:

- Narrative Functional Specification for the PLC

- Fully documented hard copy print-out of the PLC program ("As Built"/ Delivered)
- Electronic Copy of the PLC Program
- Copy of Logic Diagrams as applicable
- Training on the PLC Software provided on which the PLC Program is running.

4. ARCHIVING AND RECORDS STORAGE OF DRAWINGS AND ENGINEERING INFORMATION AND DOCUMENTATION

All storage and archiving of drawing records and engineering documentation/information shall be in line with EPC0001 (Eskom Documentation Management Procedure), 36-1 (Standard for Management System Documents, Correspondence and Records) and 36-2 (Writing And Controlling Management System Documents).

5. DRAWING META DATA REQUIRED

5.1 The following drawing meta-data are mandatory for capture with ***each drawing*** generated:

META DATA	Example		
Eskom Drawing Number:	0.57/12342		
Full Drawing Title:	Duvha Power Station, Coal Milling Plant, Service Air P&ID		
Drawing Sheet:	2 of 5		
Sub Sheet:	-		
Latest Revision:	12		
Sheet Print Size:	A0		
Information Classification:	Level 3 – Controlled Disclosure		
Design Classification:	Level 2		
Discipline:	Mechanical		
Drawing Status:	As Built & Approved		
Authorised Date:	2000/01/10		
Authorised By:	D van Rensburg – D&S Manager		
Functional Responsibility (Information Owner):	Boiler Plant Engineering Section Duvha Power Station		
Cross Reference Drawing No & Title	0.57/6789	Unit #1 Boiler House Floor Lay-Out	
	0.57/14555	Milling Plant Service Air Supply Compressor	
	0.57/1433	Coal Milling Plant General Arrangement	
Relevant Plant KKS/AKZ Code(s)	01NM30D050 01NM20D050		
Manufacturer's/OEM Name:	Babcock & Wilcox		
Manufacturers/OEM Drawing No:	1433/13257889		
Construction Contract No:	OPY11282		
Media Format:	MicroStation – DGN		
Index Reference:	C 4.1		
Power Station/BU/Site:	Duvha Power Station		
Station ID:	0.57		
Office of Origin:	Duvha Site Drawing Office		
Location of Original:	MWP Archives		
Retention Period:	Station Life		
Superseded By Drawing No:	(eg if drawings were combined to become 1)		
Drawing Review Date:	2010/03/31		
Drawing Master Copies Distributed To:	Duvha Power Station CED		

Latest Revision Originator:	Duvha PS -24
Site Modification/Deviation No:	DEV1432-B-1
MWP Work Request No:	DUV.001.004

5.2 This drawing meta-data shall be captured in electronic format in the EDMS and/or Plant Engineering System (Bentley/Intergraph) and shall have a record and audit trail associated for each drawing that exists.

5.3 The following meta-data must be captured for engineering related documentation:

META DATA	Example		
Eskom Document Number:	200-12342		
Previous Unique Doc Number	EE-Spec0145		
Full Document Title:	Duvha Power Station, Coal Milling Plant, Service Air P&ID		
Document Category:	Manual		
Document Sub-Category::	Operating		
Latest Revision:	4		
Compiled By:	HH Smith		
Date of Publication	2007-12-23		
Document Status:	Approved		
Authorised Date:	2000/01/10		
Authorised By:	D van Rensburg – D&S Manager		
Information Classification:	Level 3 – Controlled Disclosure		
Design Classification:	Level 2		
Discipline:	Operating		
Functional Responsibility (Information Owner):	Boiler Plant Engineering Section Duvha Power Station		
Cross Reference Document No & Title	200-342225	Milling Plant Operating Philosophy	
	200-3554	Milling Plant Service Air Supply Compressor	
	0.57/1433	Coal Milling Plant General Arrangement	
Relevant Plant KKS/AKZ Code(s)	01NM30D050 01NM20D050		
Manufacturer's/OEM Name:	Babcock & Wilcox		
Manufacturers/OEM Document No:	1433/13257889		
Construction Contract No:	OPY11282		
Document Transmittal No:	OPY11282/2445		
Media Format:	MS Word (DOC)		
Document Master Copies Distributed To:	Duvha Boiler Plant Manager		
	Duvha Site Library		
Location of Original:	EED – Engineering Support		
Review Date:	2010-03-15		
Retention Period:	Station Life		
Destruction Date:	Not Applicable		
Superseded By Drawing No:	Not Applicable		
Archiving Requirements:	Retain All Previous Revisions		
Archiving Format:	Electronic Copy Only		

6. DISASTER RECOVERY AND BUSINESS CONTINUITY PLANNING FOR DRAWINGS AND ENGINEERING INFORMATION

6.1 Appropriate Disaster Recovery Procedures shall be put in place by the Generation Business Unit as well as Eskom Drawing Office and Contractors to ensure availability of plant information and drawings at all times.

6.2 Appropriate Business Continuity Plans shall be put in place by the Generation Business Unit as well as Eskom Drawing Office and Contractors to ensure operability of plant and access to appropriate engineering drawings and information during disasters.

6.3 Adherence to the required Information Security Best Practice shall be ensured at all times, specifically keeping Anti-Virus Software Signatures up to date and loading the required software patches on both MicroSoft as well as Bentley Software as soon as they become available. This is considered critical on IT infrastructure utilised to store, manage and archive drawings and related engineering information.

6.4 A hardcopy of the drawing meta-data shall be available at all times and may not be older than 6 months at any given period of time (for BCP purposes).

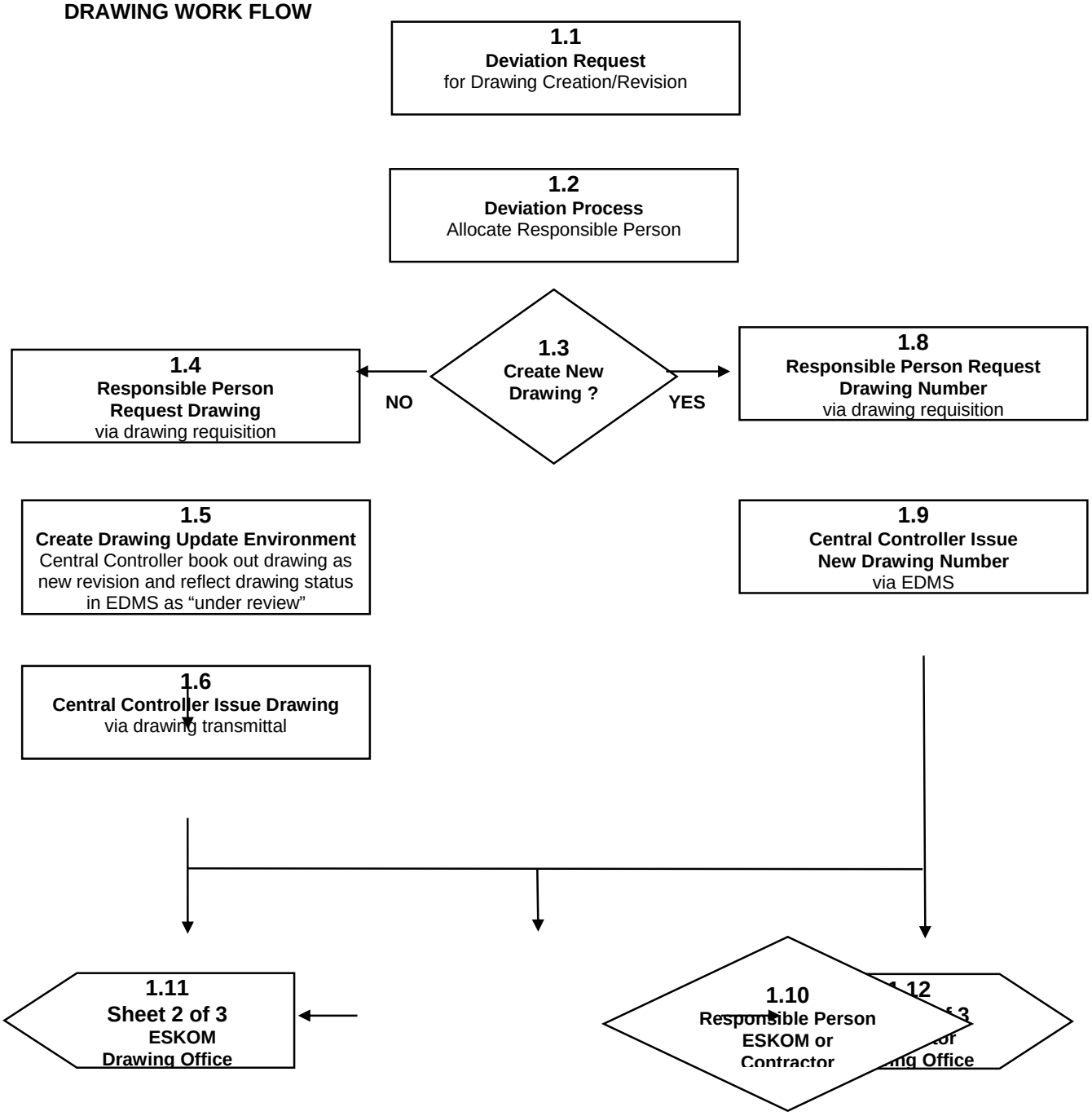
6.5 The original, latest revision approved drawing shall be submitted to MWP for capture on microfilm and converted to electronic format (where required). This drawing will be considered the latest approved version of the drawing in instances where an information availability disaster is declared and will stay in force until Disaster Recovery is complete.

SECTION D - ANNEXURES

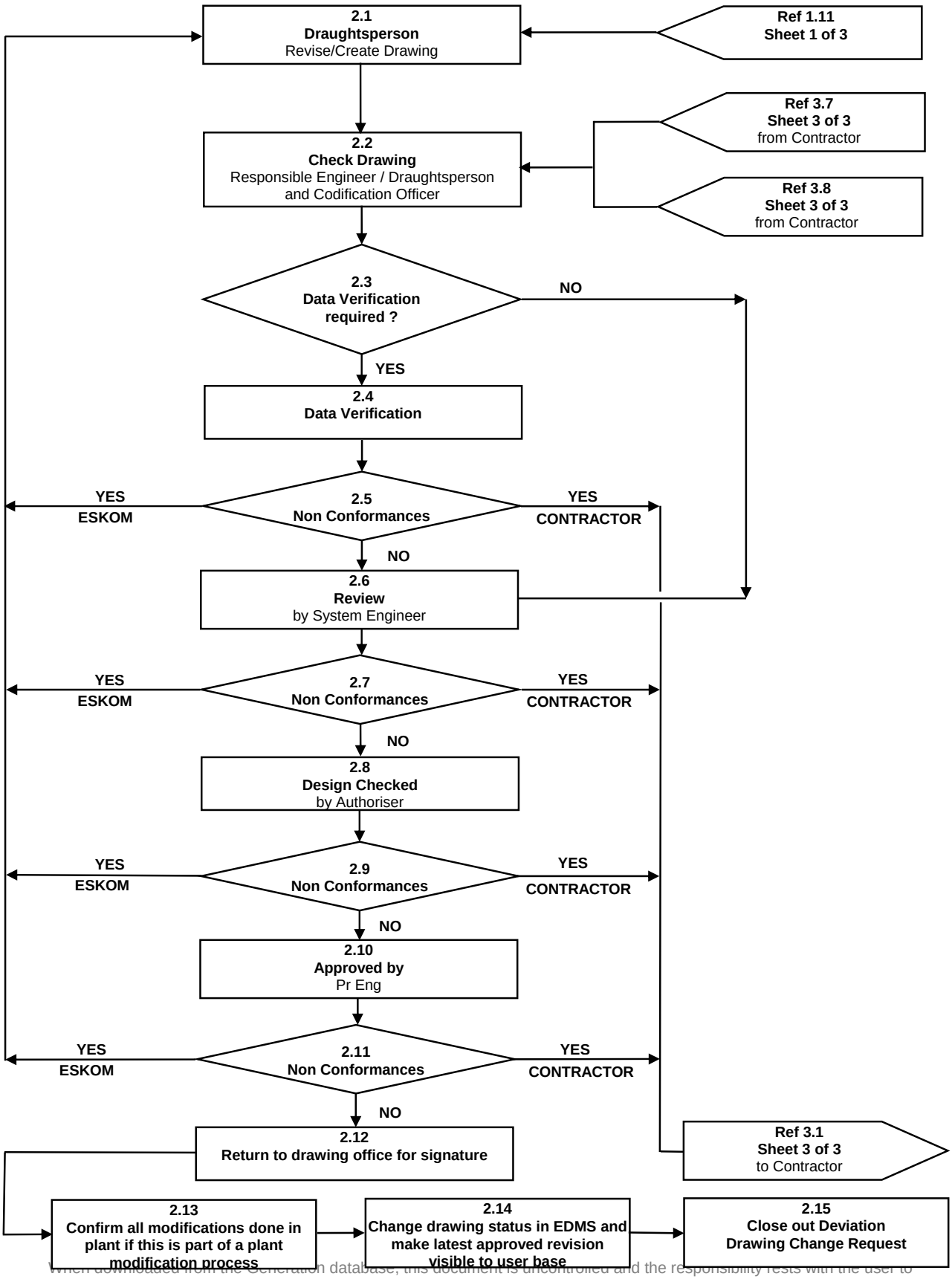
ANNEXURE A	DRAWING WORK FLOW
ANNEXURE B	DRAWING REQUISITION
ANNEXURE C	DOCUMENT TRANSMITTAL
ANNEXURE D	NON CONFORMANCE REPORT (NCR)
ANNEXURE E	STANDARD LAYERS AND COLOURS
ANNEXURE F	EXAMPLES OF STAMPS
ANNEXURE G	DRAWING TITLE BLOCKS
ANNEXURE H	STANDARD CHECKLIST FOR DRAWINGS
ANNEXURE I	NON-DISCLOSURE AGREEMENT

ANNEXURE 'A'

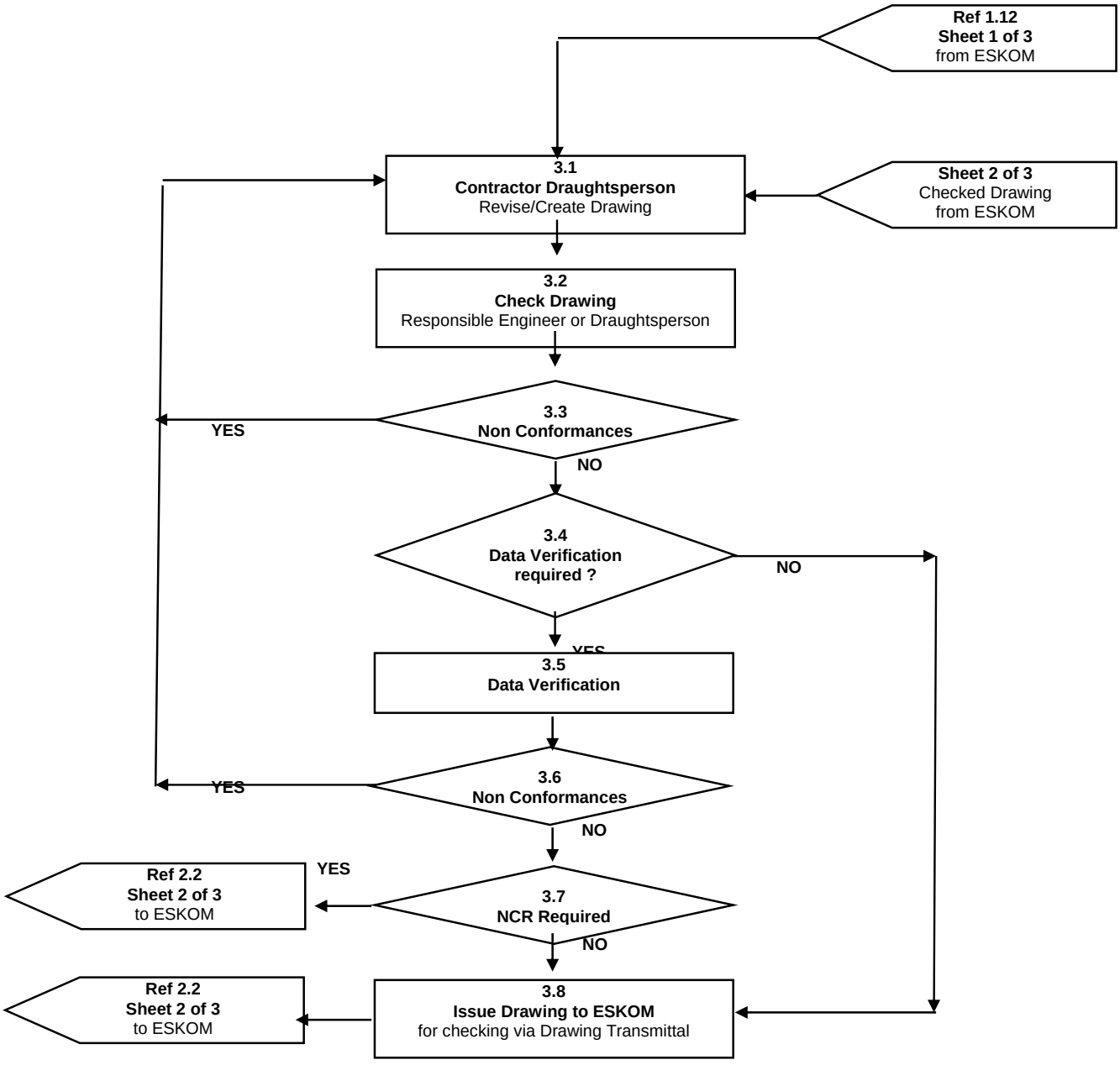
DRAWING WORK FLOW



ESKOM DRAUGHTING OFFICE



CONTRACTOR DRAUGHTING OFFICE



ANNEXURE 'B'

Eskom Generation	**DRAWING REQUISITION**	**REQUISITION NO**
		DATE

REQUESTED BY	**REQUESTED FROM**
NAME **COMPANY** **VENDOR NO** **ADDRESS** **CONTACT TEL:** **E-MAIL:**	**ESKOM** **POWER STATION** **ADDRESS** **CONTACT TEL:** **E-MAIL:**

ESKOM PROJECT NUMBER		**CONTRACTOR REF NUMBER**	

QTY	**DRAWING NO**	**DRAWING TITLE**	**REVISION**

FORMAT REQUIRED		**COMMENTS**
PAPER	☐	
ELECTRONIC	☐	

REQUESTED BY:

NAME	**DESIGNATION/COMPANY**	**DATE**	**SIGNATURE**

AUTHORISED BY:

NAME	**DESIGNATION**	**DATE**	**SIGNATURE**

ISSUED BY:

NAME	**DESIGNATION**	**DATE**	**SIGNATURE**

ANNEXURE 'C'

Eskom Generation	**DOCUMENT TRANSMITTAL**	**TRANSMITTAL NO**
		DATE

ISSUED BY	**ISSUED TO**
NAME **COMPANY** **VENDOR NO** **ADDRESS** **CONTACT TEL:** **E-MAIL:**	**ESKOM** **UNIT** **ADDRESS** **CONTACT TEL:** **E-MAIL:**

ESKOM PROJECT NUMBER		**CONTRACTOR REF NUMBER**	

DRAWING NO	**DRAWING TITLE**	**REVISION**

TRANSMITTED FOR:

CHECKING	☐	APPROVAL	☐	AUTHORISATION	☐	QUOTATION	☐	CONSTRUCTION	☐

OTHER:

ISSUED BY:

NAME	**DESIGNATION/COMPANY**	**DATE**	**SIGNATURE**

RECEIVED BY:

NAME	**DESIGNATION**	**DATE**	**SIGNATURE**

ANNEXURE 'D'

Eskom Generation	**NON CONFORMANCE REPORT**	**DEVIATION NUMBER**
		ESKOM PROJECT NUMBER

ISSUED BY	**ISSUED TO**
NAME **COMPANY** **VENDOR NO** **ADDRESS** **CONTACT TEL:** **E-MAIL:**	**ESKOM** **UNIT** **ADDRESS** **CONTACT TEL:** **E-MAIL:**

DRAWING NO	**DRAWING TITLE**	**REVISION**

ITEM NO	**DESCRIPTION OF NON CONFORMANCE**

ISSUED BY:

NAME	**DESIGNATION/COMPANY**	**DATE**	**SIGNATURE**

RECEIVED BY:

NAME	**DESIGNATION**	**DATE**	**SIGNATURE**

ANNEXURE 'E'

STANDARD LAYERS AND COLOURS

Layer Name	Layer Number	Layer Description	Colour	Line Style	Line Weight
Default	0	Microstation Default Level	0	0	0
Civil_Ceilings	1	Ceilings	55	0	4
Civil_NonBrickWalls	2	Non Brick Walls	119	0	4
Civil_Columns	3	Cast Concrete Columns	32	0	4
Civil_DoorsWindows	4	Doors And Windows	16	0	4
Civil_DrainsCovers	5	Floor Drains, Covers And Man Ways	39	0	4
Civil_Existing	6	Existing Buildings	4	2	0
Civil_Foundations	7	Foundations	16	0	4
Civil_Floors	8	Floors	16	0	4
Civil_Plinths	9	Plinths	16	0	4
Civil_Reinforcing	10	Bending Schedules And Reinforcing Details	7	0	1
Civil_Roof	11	Roof Sheeting	87	0	4
Civil_StairCases	12	Concrete Stair Cases	103	0	4
Civil_Slabs	13	Slabs	16	0	4
Civil_Walls	14	Walls	7	0	4
Civil_CustomLayers01	15	Customised Civil Level 01	16	0	4
Civil_CustomLayers02	17	Customised Civil Level 02	16	0	4
Civil_CustomLayers03	18	Customised Civil Level 03	16	0	4
Civil_CustomLayers04	19	Customised Civil Level 04	16	0	4
Civil_CustomLayers05	20	Customised Civil Level 05	16	0	4
Clouds	21	Clouds	3	0	1
Dimensions	22	Dimensions	16	0	1
Electrical_HV_CableRoutes	23	HV Cable Routes	6	0	3
Electrical_LV_CableRoutes	24	LV Cable Routes	6	0	3
Electrical_Computers	25	Computer Points	70	0	3
Electrical_Existing	26	Existing Electrical	84	2	0
Electrical_Lightings	27	Lighting & Switch Points	38	0	3
Electrical_PanelsCabinets	28	Electrical Panels And Cabinets	86	0	3
Electrical_PowerPoints	29	Power Points	22	0	3
Electrical_Telephone	30	Telephone Points	54	0	3
Electrical_CustomLayers01	31	Customised Electrical Level 01	22	0	3
Electrical_CustomLayers02	32	Customised Electrical Level 02	22	0	3
Electrical_CustomLayers03	33	Customised Electrical Level 03	22	0	3
Electrical_CustomLayers04	34	Customised Electrical Level 04	22	0	3
Electrical_CustomLayers05	35	Customised Electrical Level 05	22	0	3
Equipment_Existing	36	Existing Plant Equipment	52	2	0
Equipment_MajorRotating	37	Major Rotating Equipment	16	0	3
Equipment_MajorStatic	38	Major Static Equipment	64	0	3
Equipment_MinorRotating	39	Minor Rotating Equipment	32	0	3
Equipment_MinorStatic	40	Minor Static Equipment	80	0	3
HatchPatterns	41	Hatch Patterns	16	0	0
HVAC_Existing	42	Existing HVAC Equipment	76	2	0
HVAC_RotatingEquipment	43	HVAC Rotating Equipment	2	0	2
HVAC_VentilationDucting	44	HVAC Ventilation Ducts	18	0	2
HVAC_VentilationVentGrids	45	HVAC Ventilation Grids	34	0	2
Instrument_Existing	46	Existing Instrumentation	15	2	2
Instrument_New	47	New Instrumentation	15	0	2
Instrument_CableRoutes	48	Instrumentation Cable Routes	95	0	2
MTO	49	Material Take Off	0	0	0
Structural_BeamsColumns	50	Steel Beams And Columns	5	0	2
Structural_Bracing	51	Steel Bracing	53	0	2
Structural_Existing	52	Existing Steel Structures	108	2	0
Structural_FloorGrating	53	Steel Floor Grating Or Plate	16	0	2
Structural_GrabRails	54	Grab Rails	92	0	2
Structural_HandRailStanchions	55	Stanchions	144	0	2
Supports_Existing	56	Existing Supports	124	2	0

Layer Name	Layer Number	Layer Description	Colour	Line Style	Line Weight
Supports_New	57	New Supports	130	0	2
TextCallOut	58	Call Out Bubbles	16	0	0
TextDetail	59	Detailing Text	16	0	1
TextHeading	60	Text Headings	16	0	1
TitleBlock	61	Drawing Title Block	0	0	1
TitleBlockContractor	62	Drawing Title Block For Contractors	0	0	1
Level 1	63		16	0	0
Level 2	64		16	0	0
Level 3	65		16	0	0
Level 4	66		16	0	0
Level 5	67		16	0	0
Level 6	68		16	0	0
Level 7	69		16	0	0
Level 8	70		16	0	0
Level 9	71		16	0	0
Level 10	72		16	0	0
Level 11	73		16	0	0
Level 12	74		16	0	0
Level 13	75		16	0	0
Level 14	76		16	0	0
Level 15	77		16	0	0
Level 16	78		16	0	0
Level 17	79		16	0	0
Level 18	80		16	0	0
Level 19	81		16	0	0
Level 20	82		16	0	0
Level 21	83		16	0	0
Level 22	84		16	0	0
Level 23	85		16	0	0
Level 24	86		16	0	0
Level 25	87		16	0	0
Level 26	88		16	0	0
Level 27	89		16	0	0
Level 28	90		16	0	0
Level 29	91		16	0	0
Level 30	92		16	0	0
Level 31	93		16	0	0
Level 32	94		16	0	0
Level 33	95		16	0	0
Level 34	96		16	0	0
Level 35	97		16	0	0
Level 36	98		16	0	0
Level 37	99		16	0	0
Level 38	100		16	0	0
Level 39	101		16	0	0
Level 40	102		16	0	0
Level 41	103		16	0	0
Level 42	104		16	0	0
Level 43	105		16	0	0
Level 44	106		16	0	0
Level 45	107		16	0	0
Level 46	108		16	0	0
Level 47	109		16	0	0
Level 48	110		16	0	0
Level 49	111		16	0	0
Level 50	112		16	0	0
Level 51	113		16	0	0
Level 52	114		16	0	0
Level 53	115		16	0	0
Level 54	116		16	0	0
Level 55	117		16	0	0

Layer Name	Layer Number	Layer Description	Colour	Line Style	Line Weight
Level 56	118		16	0	0
Level 57	119		16	0	0
Level 58	120		16	0	0
Level 59	121		16	0	0
Level 60	122		16	0	0
Level 61	123		16	0	0
Level 62	124		16	0	0
Level 63	125		16	0	0

ANNEXURE 'F'

EXAMPLES OF STAMPS

PRELIMINARY

ISSUED FOR CONSTRUCTION

AS BUILT

CONTROLLED COPY

SUPERSEDED

CANCELLED

Controlled Copy

Issued To

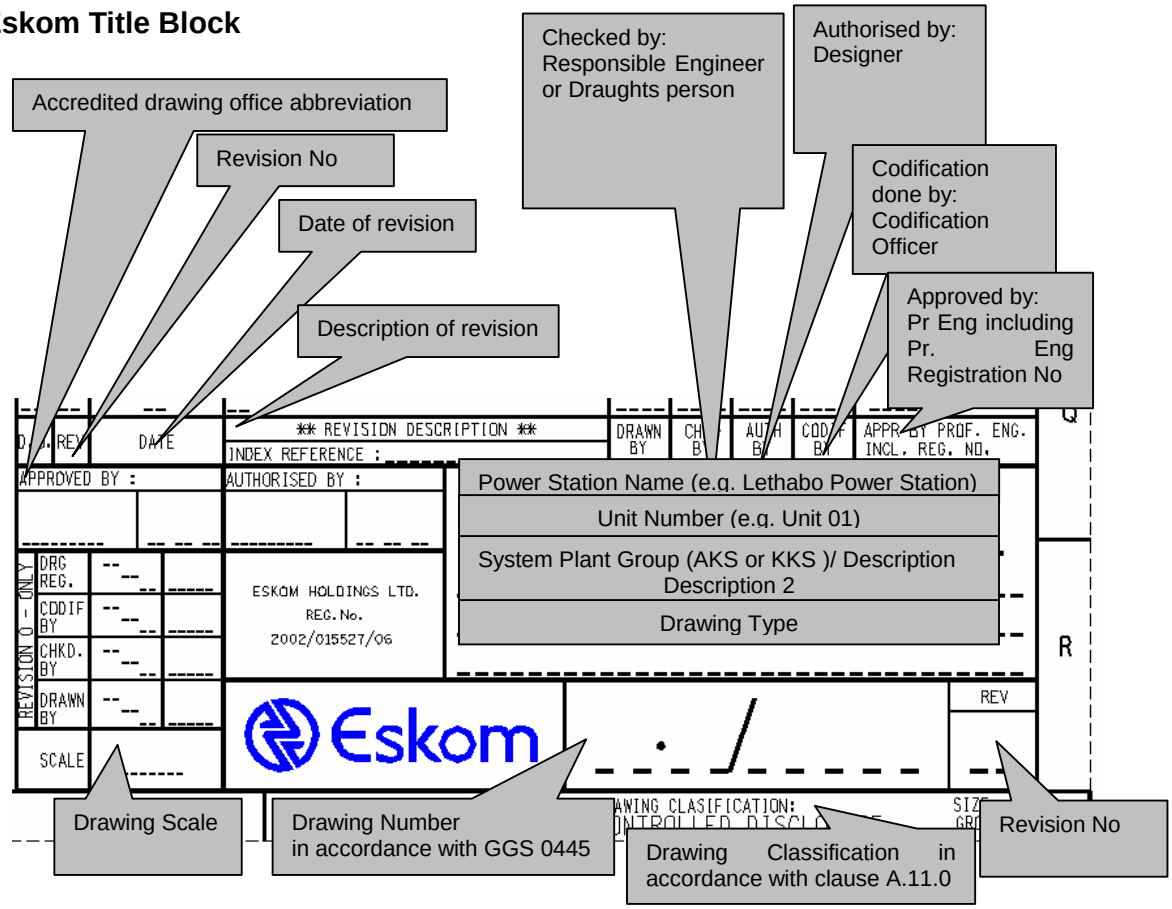
Date of Issue:

CHECK PRINT

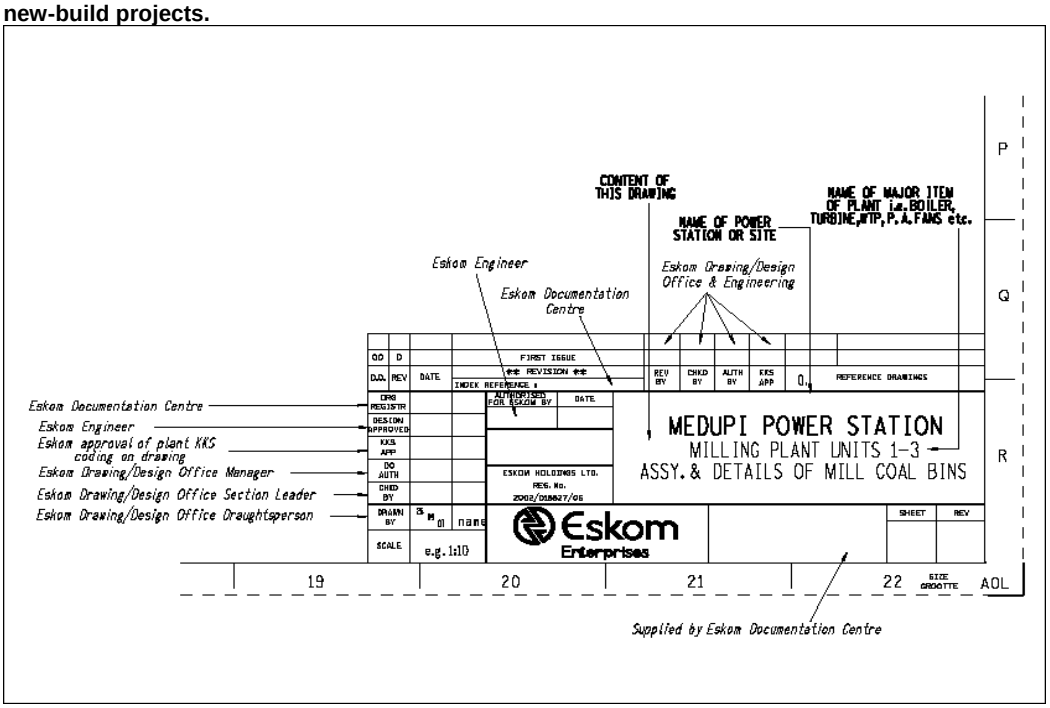
Signature Date

ANNEXURE 'G'

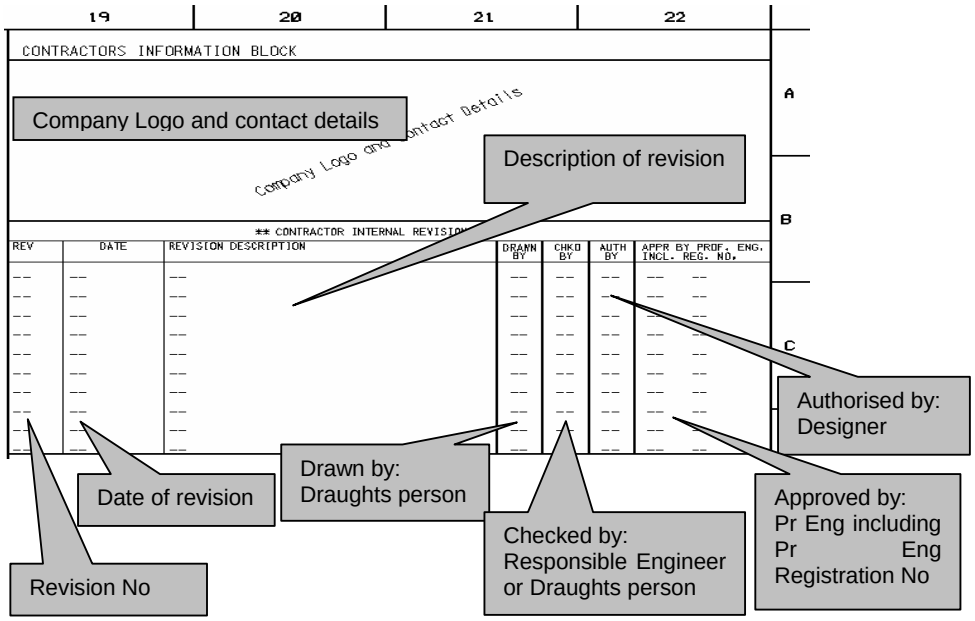
Eskom Title Block



The Title Block used by Eskom Enterprises Division, is also acceptable for upgrade/modification or new-build projects.



Contractor Title Block



ANNEXURE 'H'

Eskom Generation	**DRAWING CHECKLIST**	**CHECKLIST NO**
		DATE

Drawing No	
Revision	
Date	

No	Description	Complies	Does Not Comply
1	**Eskom section of the title block**:		
	Power Station Name		
	Unit number	☐	☐
	System Plant Group (AKS or KKS)/ Description	☐	☐
	Drawing Type	☐	☐
	Drawing Number in accordance with GGS 0445	☐	☐
	Drawing classification in accordance with clause A.11.0	☐	☐
	Drawing Scale	☐	☐
	Accredited drawing office abbreviation (if revised by Eskom)	☐	☐
	Revision No	☐	☐
	Date of revision	☐	☐
	Description of revision	☐	☐
	Drawn by: Draughtsperson	☐	☐
	Checked by: Responsible Engineer or Draughtsperson	☐	☐
	Authorised by: Designer	☐	☐
	Codification by: Codification Officer	☐	☐
	Approved by: Pr Eng including ECSA Pr Eng Registration No	☐	☐
2	**Contractor section of the title block where applicable**:		
	Company information including contract details	☐	☐
	Revision No	☐	☐
	Date of revision	☐	☐
	Description of revision	☐	☐
	Drawn by: Draughts person	☐	☐
	Checked by: Responsible Engineer or Draughts person	☐	☐
	Authorised by: Designer	☐	☐
	Approved by: Pr Eng including ECSA Pr Eng Registration No	☐	☐
3	All applicable reference drawings are indicated in the reference drawings section.	☐	☐
4	All applicable notes are indicated in the notes drawing section.	☐	☐
5	Text:		
	• in accordance with the standard	☐	☐
	• spelling is correct	☐	☐
	• standard approved abbreviations are used and applied consistently	☐	☐
	• words spelled out where possible	☐	☐
6	Dimensions:		
	• in accordance with the standard	☐	☐
	• indicated showing clear intent	☐	☐
	• do not overlap with other drawing elements	☐	☐
7	The following drawing symbology in accordance with the standard:		
	• lines	☐	☐
	• layers	☐	☐
	• levels	☐	☐
8	Drawing is legible with no overlapping lines	☐	☐
9	All marked up items have been incorporated as required	☐	☐

CHECKED BY:

NAME	DESIGNATION/COMPANY	DATE	SIGNATURE

RECEIVED BY:

NAME	DESIGNATION	DATE	SIGNATURE

ANNEXURE 'I'

NON-DISCLOSURE AGREEMENT FORM EXAMPLE

Eskom
Memo Generation

(ID No.:)

To

Copy to

Date

Intellectual Property Protection
Company VAT No:
Eskom Vendor No:

Subject

advised that the drawing(s) attached, (0.63/ Rev) provided to you, is considered the intellectual property of Eskom and Eskom ……. Power Station.

This data/information is made available solely for quotation/……. purposes, and may not be reproduced, copied or made available to any third party without prior consent from the Power Station manager.

All information referred to herein need to be returned to Eskom ……Power Station Drawing office on completion of the project.

Signature: …… Date ……
M-band Manager

ACKNOWLEDGEMENT OF RECEIPT:

Signature: …….. Date ……
Supplier

…….. Power Station
Tel +27 ……
Fax +27 ……

Revisions Information

Date	Rev.	Remarks
September 2007	0	Revised the requirements for Generation and aligned it with latest drawing office best practice and draughting software requirements. At the same time converted the standard into the Eskom document template, as per the decision of the Generation Document Working group. This standard was previously known as GGS0991, Revision 0.