

 Eskom	Task Manual	Technology
---	-------------	------------

Title: **EXCAVATION FOR LINES & SUBSTATIONS**

Unique Identifier: **240-129249916**

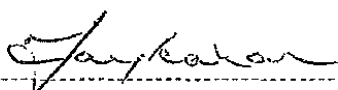

Alternative Reference Number: **34-185**

Area of Applicability: **Engineering**

Next Review Date: **STABILISED**

COE Acceptance

DBOUS Acceptance

Archie Jaykaran

Amelia Mtshali

Power Delivery Maintenance Study
Committee Chairperson

DBOUS Senior Manager

Date: 28-02-18

Date: 07/03/2018

This document is **STABILISED**. The technical content in this document is not expected to change because the document covers: *(Tick applicable motivation)*

1	A specific plant, project or solution	
2	A mature and stable technical area/technology	x
3	Established and accepted practices.	x

Document already Stabilized with old document number

PCM Reference: <xxxxxx>

SCOT Study Committee Number/Name: **Asset Management**

Document Classification: **Controlled Disclosure**

Title: **Distribution Task Manual – Part 24**

Unique Identifier: **34-185**

**EXCAVATION FOR LINES &
SUBSTATIONS**

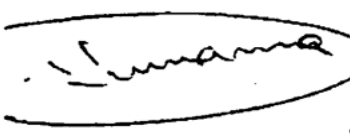
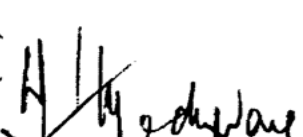


Document Type: **DMN**

Revision: **1**

Published date: **JANUARY 2011**

Total pages: **10**

Review date: **JANUARY 2016**

COMPILED BY	APPROVED BY	FUNCTIONAL RESP	AUTHORISED BY
 V LUTSHABA TCO MEW	 I R LEDINGWANE for MEW-Forum	 C SMITH for TESCOOD	 MN BAILEY CMDT for MD (Dx)
DATE: 04/11/2010	DATE: 04/11/2010	DATE: 30/11/2010	DATE: 20.12.2010

Content

	Page
Foreword.....	2
1 Scope	3
1.1 Purpose	3
1.2 Applicability	3
2 Normative References.....	3
3 Definitions and abbreviations	3
3.1 Definitions	3
3.2 Abbreviations	4
4 Task Manual	4
4.1 Risk Assessment	4
4.2 Excavation	5
4.3 Record Keeping	6
5 Roles and Responsibilities	6
5.1 The Principal Construction Official or his delegate shall ensure that:	6
5.2 The responsible person on site shall ensure that:	6
6 Process for monitoring	6
7 Related/Supporting Documents	6
Annex A - Impact assessment.....	7

Foreword

This document has been developed to meet Safety, Health and Environmental and Quality requirements in the construction of lines and substations.

Revision history

This revision cancels and replaces revision no 0 of document no. **DWN_34-185**.

Date	Rev.	Clause	Remarks
Jan 2011	1	-	Compiled By: J Nezar as compiler is replaced by V Lutshaba
		Clause no.2	Changed document reference numbers under normative references,.
		Development Team	Included and removed names under development team
Sept 2007	0		Document approved

Authorisation

This document has been seen and accepted by:	
Name	Designation
MN Bailey	Corporate Manager Divisional Technology
C D Smith	Engineering Processes Manager
I Ledingwane	MEW-Forum

This task manual shall apply throughout Eskom Holdings Limited, its divisions, subsidiaries and entities wherein Eskom has a controlling interest.

Development team

This document was developed by a team consisting of the following persons:

Bertie Kotzé	Willian Sehako	Ishmael Ledingwane
Vuy Lutshaba	Philemon Mzobe	Johan Myburg
Piet Pretorius	Ton Claasen	Tommy Meyer
Josiah Tshabangu	Neil Williams	Kholeka Dyakala

Cliff Ferns

Keywords

Guide, Excavate and Barricade

1 Scope

1.1 Purpose

The purpose of this document is to guide the persons required to do the excavations for cabling, foundations and earthing for the construction of lines and substations.

1.2 Applicability

This Task Manual is applicable to all the Eskom, Major Engineering Works persons doing the excavations for Eskom.

2 Normative References

The following documents contain provisions that, through reference in the text, constitute requirements of this Task Manual. At the time of publication, the editions indicated were valid. All standards and specifications are subject to revision, and parties to agreements based on this instruction are encouraged to investigate the possibility of applying the most recent editions of the documents listed below. Information on currently valid national and international standards and specifications can be obtained from the Information Centre and Technology Standardization Department at Megawatt Park: Definitions and abbreviations

OSHA Construction Regulations

ESKPVAEY6: Rev. 6, *Operating regulations for high voltage systems (ORHVS)*.

DSP34-323: Rev.0, *Personal protective equipment specification*.

DST 34-1717: Rev 0, *Provision and issue of personal protective equipment*

DPC 34-227: Rev.0, *Pre-task planning and feedback process*.

EPL 32-94: Rev.0, *Safety, Health and Environmental (SHE) policy*

ETE 34-1005: Rev 0, *Environmental management policy*.

DPC34-333: Rev. 3, *OHS act requirements to be met by principal contractors employed by Eskom distribution*

DPC34-228: Rev. 0, *Health and safety representative's inspection reports and guidelines*

Note: Each entity to research DT standards applicable to their own function.

3 Definitions and abbreviations

3.1 Definitions

Trained: means to be trained, assessed and found competent

3.2 Abbreviations

MEW: Major Engineering Works

RAS: Risk Audit System

4 Task Manual

4.1 Risk Assessment

Risk assessment shall be done on site for each new task and in accordance with DCP34-227

. Risks identified shall be recorded together with the steps to be taken to minimize such risks.

4.1.1 The risk assessment shall cover risks associated with at least the following:

- Working in close proximity to live equipment
- Roadside work
- Noise levels and effectiveness of communication
- Work in elevated positions
- Condition of poles, structures, hardware and conductors
- Weight of poles, structures, hardware and conductors to be lifted or displaced
- Rating of equipment (SWL, kV)
- Integrity of line
- Integrity of structures
- Integrity of holes and foundations
- Bystanders
- Weather conditions
- Equipment and tools
- Material or spares
- Work position of workers and specific tasks
- Overall supervision
- Complete workers register and sign

Note: The workers retain the right to refuse to work on grounds of health and safety

- There must be sufficient personnel on site to dig out the excavation and to remove the soil to a place where it will be stored to be transported away.
- Protective system i.e. shoring, sloping and benching for protecting of employees from cave-ins to be constructed according to the requirements of the OHS act.
- No person is allowed below the structure being erected

4.1.2 Safety Requirements

Note: The workers retain the right to refuse to work on grounds of health and safety

- PPE as per Matrix

4.2 Excavation

4.2.1 Pre planning

4.2.1.1 Tools and equipment

Pick	Digging bars
Shovel	Water pump
Tape measure	Bucket
Ladders	Rope
Mechanical excavator	Barricading

4.2.1.2 Preparations

- Ensure that the foundation design for each structure are included in the design package(soil nomination must have been done and foundation types finalised (**DST 34-229**)
- Identify cable and services routes where applicable
- Identify the foundation position and measure and mark the layout from centre/ corner pegs.
- Ensure to work only in barricaded area when working in existing substation
- Removal of yard stone when working in existing sub station
- Clearing of vegetation as per environmental legislation
- Ensure that the excavations are done according to the nominated soil type

4.2.2 Digging

- Remove soil to the required depth
- Ensure that the shape, type and dimension of the excavation complies with the scope of work
- Ensure that no load, plant, material or equipment is placed or moved near the edge of any excavation which could cause its collapse
- Soil must be heaped at least 500 mm from edge of the excavation
- On completion of each excavation or end of shift, barricade the excavation by using the appropriate material
- Ensure that soil mounts are not piled so height that when standing on the mount the possible exists of a person coming into close proximity to overhead conductors.
- Ensure that soil mounts are not piled so height that it could restrict the sight of person supervising workers.

Note: When excavations are done with machine the environmental requirements with regards to oils leaks shall be met.

4.3 Record Keeping

- A record of all quality checks shall be kept in the relevant project file.
- A record of all on job task observation shall be kept for the RAS audit system by the Technical Contracts officer.

5 Roles and Responsibilities

The Designated Person or his delegate shall ensure that persons are trained and equipped to do excavation and earthing

5.1 The Principal Construction Official or his delegate shall ensure that:

- 5.1.1** The quality inspections are carried out and quality report completed
- 5.1.2** All environmental requirements are met
- 5.1.3** The correct type of barricading is available on site
- 5.1.4** The necessary equipment that will prevent the walls of an excavation collapse is available on site if required (as per scope of work)
- 5.1.5** Applicable drawings and scope of work are on site

5.2 The responsible person on site shall ensure that:

- 5.2.1** That the setting out of the foundation is correct
- 5.2.2** That the measurements are correct for every specific foundation
- 5.2.3** All safety requirements are met for every specific scope of work
- 5.2.4** Risk analysis is done
- 5.2.5** Adequate supervision on all persons on the work site is carried out to ensure their safety

6 Process for monitoring

This document shall be reviewed every five years if necessary. The MEW managers and or the IARC representative (for MEW) may at any time request a revision of this document. This document shall also be revised if major changes to technology, legal requirements or best practices necessitate it.

Minor changes that will affect the outcomes detailed in this document if recorded in the MEW manager's forum decision log will be valid till date of next revision.

7 Related/Supporting Documents

Page 2 18 to 22 of OSHA Construction Regulations.

Annex A - Impact assessment

(Normative)

Impact assessment form to be completed for all documents.**1 Guidelines**

- All comments must be completed.
- Motivate why items are N/A (not applicable)
- Indicate actions to be taken, persons or organisations responsible for actions and deadline for action.
- Change control committees to discuss the impact assessment, and if necessary give feedback to the compiler of any omissions or errors.

2 Critical points

2.1 Importance of this document. E.g. is implementation required due to safety deficiencies, statutory requirements, technology changes, document revisions, improved service quality, improved service performance, and optimised costs.

Comment: This document has been developed to ensure that the method of working in the MEW environment is aligned to the latest safety, health, environmental and quality requirements and technology and that all work is standardised through out Eskom Distribution

2.2 If the document to be released impacts on statutory or legal compliance - this need to be very clearly stated and so highlighted.

Comment: The document enhances the existing statutory or legal compliance requirements.

2.3 Impact on stock holding and depletion of existing stock prior to switch over.

Comment: The existing commercial practices are applicable at the implementation of the document.

2.4 When will new stock be available?

Comment: N/A. The prevailing stock arrangements will be applicable at implementation of the document.

2.5 Has the interchangeability of the product or item been verified - i.e. when it fails is a straight swap possible with a competitor's product?

Comment: N/A. The document deals more with construction methods and not with products.

2.6 Identify and provide details of other critical (items required for the successful implementation of this document) points to be considered in the implementation of this document.

Comment: The staff should have been adequately trained in the execution of the work as this does not constitute a training manual.

2.7 Provide details of any comments made by the Regions regarding the implementation of this document.

Comment: The document was developed by the regional MEW subject matter experts (SME's)

ESKOM COPYRIGHT PROTECTED

Annex A

(Continued)

3 Implementation timeframe**3.1 Time period for implementation of requirements.**

Comment: N/A The time frame for the implementation of the out puts will be ongoing on both the existing and to all new work.

3.2 Deadline for changeover to new item and personnel to be informed of DX wide change-over.

Comments : N/A .The document does not introduce new practices.

4 Buyers Guide and Power Office**4.1 Does the Buyers Guide or Buyers List need updating?**

Comment: N/A All resources envisaged in the document are expected to be as listed previously.

4.2 What Buyer's Guides or items have been created?

Comment: None.

4.3 List all assembly drawing changes that have been revised in conjunction with this document.

Comment: None

4.4 If the implementation of this document requires assessment by CAP, provide details under 5

Comment: N/A .No assessment is required.

4.5 Which Power Office packages have been created, modified or removed?

Comment: None

5 CAP / LAP Pre-Qualification Process related impacts**5.1 Is an ad-hoc re-evaluation of all currently accepted suppliers required as a result of implementation of this document?**

Comment: No

5.2 If NO, provide motivation for issuing this specification before Acceptance Cycle Expiry date.

Comment: N/A. No new services or products are required from the Suppliers.

5.3 Are ALL suppliers (currently accepted per LAP), aware of the nature of changes contained in this document?

Comment: N/A.. No new services or products are required from the Suppliers.

ESKOM COPYRIGHT PROTECTED

Annex A

(Continued)

Is implementation of the provisions of this document required during the current supplier qualification period?

Comment: N/A. There will be no impact on any product

5.4 If Yes to 5.4, what date has been set for all currently accepted suppliers to comply fully?

Comment: N/A. There is no impact on any product.

5.5 If Yes to 5.4, have all currently accepted suppliers been sent a prior formal notification informing them of Eskom's expectations, including the implementation date deadline?

Comment: N/A. No products and services from the suppliers are affected

5.6 Can the changes made, potentially impact upon the purchase price of the material/equipment?

Comment: N/A .Existing conditions will apply.

5.7 Material group(s) affected by specification: (Refer to Pre-Qualification invitation schedule for list of material groups)

Comment: N/A. None

6 Training or communication

6.1 State the level of training or communication required to implement this document. (E.g. none, communiqués, awareness training, practical / on job, module, etc.)

Comment: Awareness of the requirements of the standard are to be discussed as part of pre-task planning during the toolbox talk.

6.2 State designations of personnel that will require training.

Comment: All the designation as indicted in the roles and responsibility section of the document which include PCO, SCO and CO.

6.3 Is the training material available? Identify person responsible for the development of training material.

Comment: The document itself shall be used for personnel awareness.

6.4 If applicable, provide details of training that will take place. (E.G. sponsor costs, trainer, schedule of training, course material availability, training in erection / use of new equipment, maintenance training, etc).

Comment: The document is to be made available at each instance where the activity is to be executed. The document is formulated around the construction activities.

6.5 Was Training & Development Section consulted w.r.t training requirements?

Comment: N/A. The services of the Training and Development Section are not required.

ESKOM COPYRIGHT PROTECTED

Annex A

(Continued)

7 Special tools, equipment, software

7.1 What special tools, equipment, software, etc will need to be purchased by the Region to effectively implement?

Comment: None. The existing resources are applicable.

7.2 Are there stock numbers available for the new equipment?

Comment: N/A. No new equipment is to be introduced to implement this document.

7.3 What will be the costs of these special tools, equipment, software?

Comment: None.

8 Finances

8.1 What total costs would the Regions be required to incur in implementing this document? Identify all cost activities associated with implementation, e.g. labour, training, tooling, stock, obsolescence

Comment: N/A. No major costs are incurred.

.....

.....

.....

Impact assessment completed by:

Name: Vuy Lutshaba

Designation: TCO - MEW