

Distribution Task Manual –
Part 24: MEW

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BACKFILL AND COMPACTING OF
EXCAVATIONS

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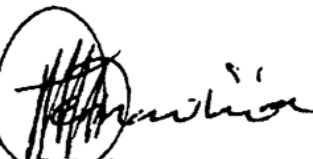
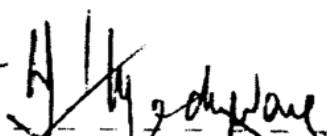
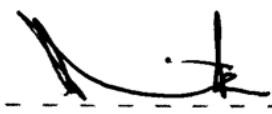

Stabilized: Approved standards¹ that:

- i. Address mature technologies or practices
- ii. Are required for use in connection with existing implementations or for reference purposes
- iii. Contain no identified significant erroneous information
- iv. Are not likely to require revisions.

¹ The term standard covers specifications, standards, technical bulletins, technical instructions, procedures, guidelines and any other document that follow the SCOWT process

Document Classification: **Controlled Disclosure**

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Foreword

This document has been developed to meet safety, health, environment and quality requirements in the construction of line and substation

Revision history

This revision cancels and replaces revision no 0 of document no. **DWN_34-183**.

Date	Rev.	Clause	Remarks
Jan 2011	1	-	Compiled By: A J Nemavhidi Changed compiler from IR Ledingwane to A.J NEMAVHIDI Document number changed to DMN 34-183
		2	Normative references have been updated
		-.	Names of development team changed
		3.1	Definition of "Excavation" added
		3.2	Two new abbreviations added
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 Task Manual was developed by a team consisting of the followed person:

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Kholeka Dyakala

Introduction

The purpose of this document is to guide persons to do backfilling and compacting of all types excavations.

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Keywords

Backfilling and compacting

1 Scope

1.1 Purpose

The purpose of this document is to guide the persons required to correctly do backfilling and compaction of excavation.

1.2 Applicability

This Task Manual is applicable to all Eskom, Major Engineering Works persons doing backfilling and compaction of excavations.

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

PC.32-846; REV.0, *Operating regulations for high voltage systems (ORHVS)*.

DSP34-323; REV: 1, *Personal protective equipment specification*.

DCP34-227; Rev1, *Pre-task planning and feedback process*.

ETE34-1005 REV0, *Environmental management policy*.

DST34-1209; Rev.0, Soils compaction for poles and stays

DCP34-333; REV0, OHS act requirements to be met by principle contractors employed by Eskom distribution

DCP34-228: Rev. 1, health and safety representative's inspection reports and guidelines

3 Definitions and abbreviations

3.1 Definitions

Trained: means to be trained, assessed and found competent

Excavation: means any man-made cavity, trench, pit or depression formed by cutting, digging, drilling or scooping;

3.2 Abbreviations

MEW: Major Engineering Works

RAS: Risk Audit System

TM: Task Manual

WI: Task Manual

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

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-
- Overall supervision
 - Complete workers register and sign
 - The leaving of open excavation unattended must be considered when doing the risk assessment

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

- There must be sufficient persons to backfill the hole with the required material, compact the material and apply water to the material during the process.
- PPE as per Matrix

4.2 Backfilling and Compaction**4.2.1 Pre-Planning****4.2.1.1 Tools and equipment**

Pick	Compactor
Shovel	Water pump
Tape measure	Dynamic cone penetrometer
Ladders	Tractor-loader-backhoe (TLB)
Water	

4.2.1.2 Preparations

- Ensure to work only in barricaded area when working in existing substation
- Mix the backfill soil, admixture and water. The ratio for mixing the backfill material will be specified in the site instruction or in the design specification
- Clear site of excess unsuitable material and replace with material as defined in the design specification
- The soil type will determine which method of shoring will be most effective to prevent the excavation from falling in.
- Once this is determined the method and cost of shoring excavation must be considered when shoring and the employer must be made aware of implication in order to ensure that the correct method of shoring is used.

4.2.2 Backfilling and Compacting

- Back fill soil in layers not exceeding 300mm
- Compact soil to a compaction of 98% modaashto at each layer
- Repeat process to 100 mm above current ground level when back filling and compacting on foundation of lines.
- For substation yards repeat the process till ground is level with the normal level of the ground
- Replace yard stone when working in existing sub station
- Care should be taken to prevent over compaction as this will reduce density

Note: When using Tractor, loader, backhoe and compactor the environmental requirements with regards to oils leaks shall be met**ESKOM COPYRIGHT PROTECTED**

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 in the RAS file by the Technical Contracts officer

5 Roles and Responsibilities

5.1.1 The Designated Person or his delegate shall ensure that persons are trained to do backfilling and compacting

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

- Quality inspection are carried out and the quality report is completed
- All environmental requirements are met
- The correct type of soil is available for compaction
- Dynamic cone penetrometer compaction test is done

5.1.1.2 The responsible person on site shall ensure that:

- All safety requirements are met for every specific scope of work
- Risk analysis is done
- Adequate Supervision is carried out on all persons on the work site 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.

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)

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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

4.6 Is an ad-hoc re-evaluation of all currently accepted suppliers required as a result of implementation of this document?

Comment: No

5.1 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.

5.2 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.

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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

5.3 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.

5.4 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

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

Comment: N/A .Existing conditions will apply.

5.6 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 designations 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.

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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.

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Impact assessment completed by:

Name: A.J NEMAVHIDI

Designation: TCO - MEW