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Documentation Type: **Task Manual**

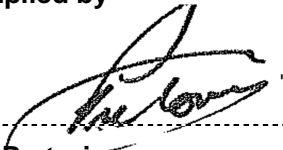
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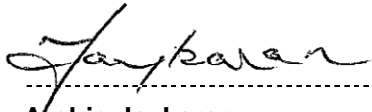
Compiled by



Piet Pretorius
OTS GOU

Date: *13/10/2015.*

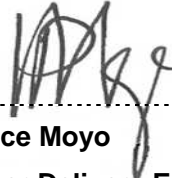
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1. Introduction

The document was compiled to conform or align with OHSAct requirements in ensuring that procedures for “Excavations” tasks are available. The task manual stipulates a procedure which seeks to ensure that personnel doing excavations are doing it in a safe manner and that the associated risks and hazards are minimised.

This Task Manual document the procedure for Excavations so as to ensure that the task is executed in a safe manner and damage to equipment and plant or injuries to staff are prevented / avoided.

2. Supporting clauses

2.1 Scope

2.1.1 Purpose

The purpose of this document is to provide persons carrying out “Excavations” with a step by step description of how to do the task, including the most critical hazards and technical specifications associated with the task

2.1.2 Applicability

This document shall apply throughout Eskom WIRES business and contractors employed by Eskom.

2.2 Normative/informative references

2.2.1 Normative

- [1] NRS 000, NRS definitions,
- [2] Occupational Health and Safety Act and Regulations (OHSAct),
- [3] ISO 9001, Quality Management Systems,
- [4] EPL_32-747: Rev 0, Safety, Health, Environment, And Quality (SHEQ) Policy,
- [5] DST_34-1710: Rev. 4, Provision and use of Personal protective equipment,
- [6] EPC_32-520, Occupational Health & Safety Risk Assessment Procedure,
- [7] DPC_34-227: Rev. 0, Pre-Task Planning and feedback process,
- [8] DPC_34-380: Rev 0, Identifying, Analysing, Documenting and observing dangerous/hazardous tasks,
- [9] 240-44175132: Rev. 0, Eskom Personal Protective Equipment Specification,
- [10] 240-86100853: Rev. 0, Standard for Barricading Prohibited Area and Live Chamber,
- [11] EPC_32-846: Rev 0, Operating Regulations for High Voltage Systems;
- [12] DPC_34-925: Rev 0. Procedure for refusal to work on the grounds of health, safety and environmental concerns, and
- [13] Manufacturers manual.

2.2.2 Informative

- [14] DPC_34-04: Rev 3, Procedure For The Preparation And Administration Of Distribution Standards,
- [15] EPC_32-247: Rev 0, Procedure for Vegetation Clearance and Maintenance within Overhead Power Line Servitudes and on Eskom Owned Land,
- [16] DGL_34-190: Rev 0, Access to Farms (includes Strategy on dealing with game farms), and
- [17] DST_34-1146: Risk of trip assessment.

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2.3 Definitions

All definitions in NRS040 and OHSAct 85 of 1993 including the following are applicable.

2.3.1 General

All definitions appropriate to the document should be included here. Refer to definitions listed in recognised industry glossaries such as NRS 000 and the IEV, and use these wherever appropriate.

All definitions in EPC_32-846 and OHSAct 85 of 1993 including the following are applicable:

Definition	Description
Authorised person	means a person, whether an employee or another person, who has been authorised in terms of these regulations
Responsible person	means a person, who has been authorised to be responsible for ensuring that the work on the apparatus covered by work permit can be, carried out with safety and within the terms of these regulations
Task Analysis	The systematic examination of all dangerous/hazardous tasks (work) in order to identify and quantify all the potential and existing inherent hazards that employees are exposed to while the tasks are being executed.
Risk Assessment	This process involves the combined functions of hazards identification, risk analysis, risk evaluation, determining the risk control strategy/s and the identification of the risk control measures that will be implemented during the task execution.
Dangerous/hazardous task	A specific element of work, which has produced and/or which possesses the potential to produce major loss or harm to people, assets, processes/production and/or the environment when performed properly.
Directive	A document which sets out a management objective, the appropriate policy if deemed necessary, as well as the functional accountability for activities to achieve that objective and the interface between functions affected by, or responsible for the execution of, such activities.
Authorized	A person who is trained and has been proven competent to carry out rotten pole replacement in terms of this standard. This authorization shall be in writing.
Note: Only persons who have satisfied the designated person on terms of the Occupational Health and Safety Act (Act 85 of 1993) (General Machinery Regulation 2(1)) that their knowledge is adequate to perform specific duties on specified plant and that their knowledge of these regulations is sufficient may be authorised.	

2.3.2 Disclosure classification

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

2.4 Abbreviations

Abbreviation	Description
CDP	Career Development Programme
CNC	Customer Network Centre
CO	Construction Official
DCP	Dynamic Cone Penetrometer
GMR	General Machinery Regulation

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Abbreviation	Description
ORHVS	Operating regulations for high voltage systems
OTS	Officer Technical Support
PCO	Principal Construction Official
PPE	Personal Protective Equipment
PTO	Principal Technical Officer
SCO	Senior Construction Official
STO	Senior Technical Officer
TCIF	Technology Change Information Forum
TO	Technical Officer
TSU	Technical Services Unit
WCO	Works-Coordinator

2.5 Roles and responsibilities

The designated person or his delegate shall ensure that this procedure is implemented and adhered to. The authorised / responsible person is responsible for the safe execution of all work and activities as set out in this procedure.

2.6 Process for monitoring

Document number	Document title
240-45920887	Process Control Manual (PCM) for Manage Maintenance Base.
240-52380420	Steering Committee of Technologies (SCOT) Standards Development and Change Implementation Procedure

2.7 Related/Supporting documents

Not applicable.

3. Requirements

3.1 Pre-job planning:

NOTE 1: The validity of all the required authorisations/ Appointments of people that will be involved in the task shall be confirmed and people with no / expired authorization /appointment will not be included in the team.

NOTE 2: In order for the task / project to be carried out in a safe manner communication between all stakeholders at/to the work site shall be available / healthy.

NOTE 3: Not establishing whether other underground services are present will lead to damage on other services or injury to the workers ie. Electrocutation, broken communication lines, damaged water pipes etc.

- a) Assessment at the site to determine the scope of work and the resources that would be required (people, equipment, PPE-as per matrix etc).
- b) Planning work and resources;
- c) Determine (where practicable) if there are other services eg: Telkom lines, other pipes, water, sewerage, gas, oil & electrical cables etc on site;

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- d) Determine other resources eg: warning signs, barricade, danger tape, as required;
- e) Ensure that the appointed persons is authorised / appointed in writing.
- f) Obtain written permission from relevant parties (property owners, owners of other services around the worksite) before excavation takes place.
- g) Ensure that communication at the work site will always be available in case of emergency.
- h) Ensure that vehicle is adequately equipped (fire extinguisher, first aid box, tools and equipment.
- i) Ensure that all tools and equipment are in a serviceable condition in accordance with manufacturer's specification.
- j) If possible take photos of the site before excavation begin to proof that rehabilitation was done correctly.

3.1.1 Tools and Equipment

- a) Excavation and shoring equipment

3.1.2 Personal Protective Equipment

All personal protective equipment shall be in accordance with 240-44175132.

- a) Hard hat;
- b) Safety shoes; and
- c) Gloves.

3.2 Procedures

3.2.1 Risk assessment

NOTE 1: Unidentified existing critical hazards and risks exposes workers and the equipment to unnecessary danger and damage.

- a) Perform on site risk assessment prior to commencement of work and continuous during the task execution.
- b) Complete Inspection register as per construction regulation prior to the commencement of each shift -

3.2.2 Site Preparation

- a) Ensure that all personnel are wearing correct PPE.
- b) Determine correct location of excavation at work site.
- c) Where other services are installed ensure that:
 - Correct cable / underground services drawings are available on site;
 - Check for any other services that can be damaged during excavation (eg: pipe lines, electrical cables, gas lines sewerage etc.); and
 - Clearly mark all possible underground obstructions.

NOTE 1: All underground cables / other services must be treated / handled with care as cables could be live and gasses toxic.

Note 2: Live cables shall not be manhandled / moved.

- d) Contractor shall appoint a competent Person in writing and take the following steps before excavation:
 - Evaluate the stability of ground adjacent buildings, walls and roads before excavation commences,

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- Ensure adequate and enough shoring equipment on site (where necessary),
 - Ensure that unused vehicles parked a safe distance from excavation site and no load or unused material / plant equipment is placed near the excavation edges,
 - Where public safety is at risk, barricade excavation site and ensure that the barricading is at least 1m high by:
 - Erecting a barrier or fence as close to the excavation as practicable.
 - Placing the excavated material in such a position during the excavation process that it would complement your barricade (e.g. place excavated material on the side of oncoming traffic).
 - In areas where there is a lot of animal movement, such as dairy or cattle farms, sheep farms, game lodges or nature reserves, it will be best to prevent any chance of animals falling in to the excavation by installing droppers and wire. Driving the droppers of 1,8 m long around the excavation to support the steel wires. The droppers must be driven into the soil to a depth of approximately 500 mm to ensure that they are sturdy
 - Attached warning notices / illuminates onto barricading device, facing away from work area.
- e) Off-load and layout tools and equipment and material.
- f) Ensure that all locations of all the services that are located at the excavation site are marked.
- g) Ensure that markings that are used are in accordance with scope of work profile.
- h) The barricading must be erected to standard before the excavation is left unattended

3.2.3 Excavations

NOTE 1: Ensure that all workers on site are wearing the appropriate personal protective equipment.

Note 2: Provision for pedestrians and vehicles (Drive ways) to cross the excavated trench could be made by placing steel plates and rails with the correct safe work load across the trench and must also be inspected daily.

- a) Ensure that exits and entrances to and from the excavation are not located at a distance more than 6m from point of work, when excavating at a depth of more than 1m.
- b) Ensure that no surface / run off water accumulate in the excavation area, divert or control it away from the excavations.
- c) Where the excavation results in any damage to the underground services or any related injury follow the next steps:
 - Stop all work within the excavations;
 - Evacuate the area and notify the appointed construction supervisor immediately; and
 - Ensure no public members interfere with worksite.

NOTE 2: Ensure that entrances / exits from the trenches are provided to safe access to / from the excavation.

3.2.3.1 Excavating (other services non-existent)

NOTE 1: A Competent Person shall investigate / evaluate as far as reasonably practicable, the stability of the ground, before and during excavation work, to establish whether shoring deemed necessary or not.

NOTE 2: Ensure that all excavations and confined spaces cautions as stipulated in the Act are observed at all times.

- a) Ensure Public Controls are carried out.
- b) Proceed with excavation.
- c) As depth increases, regular inspection must be conducted and noted in register.

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- d) Place soil far away enough from the edge of the excavation so as not to cause the edges to collapse.
- e) Assistant must remove excavated material from the edges of excavation.
- f) Post warning signs next to excavations within which inspections or work is being carried out.
- g) Suitably barricade all excavations or trenches which will not be back-filled immediately or will be left open and un-attended.
- h) Ensure that the barricading devices around the excavations remain in place.

NOTE 3: When using explosives during excavation process ensure that Explosive Legislation requirements are abided by.

3.2.3.2 Excavating (other services exists)

NOTE 1: Picks should only be cautiously used for breaking up top materials and when the ground is very hard.

NOTE 2: When using spades/shovels/picks to dig trenches caution shall be exercised so not to damage underground cables or other service at the work site.

- a) Ensure Public Controls are carried out.
- b) Proceed with excavation.
- c) Where excavating in close proximity to cables / other services use trial holes to establish or determine the presence or location of other services eg: cables / other services.
- d) Ensure that the sides of the excavation are stable to avoid collapsing of the wall.
- e) Install shoring or bracing to ensure that the excavation walls are stable.
- f) Excavated materials and equipment must be placed back at a safe distance (+/- 600mm) from the edge of the excavation.
- g) Assistant must remove excavated material from the edges of excavation.
- h) As depth increases, regular inspection must be conducted and noted in register.
- i) Ensure that the barricading devices around the excavations remain in place.
- j) Post warning signs next to excavations within which inspections or work is being carried out.
- k) Suitably barricade all excavations or trenches which will not be back-filled immediately or will be left open and un-attended.

3.2.3.3 Machine Excavating

NOTE 1: Ensure that the Operator of the excavating machine has been trained and declared competent for the job.

- a) Ensure Public Controls are carried out.
- b) Proceed with excavation.

NOTE 2: Unmarked or labelled services always make the identification of these services very difficult or impossible.

- c) Use trial holes to determine approximate depth and direction in which cable and / or other services are running.
- d) Caution must be exercised when excavation is carried out within 600mm distance of the cable or other services.
- e) Suitably barricade all excavations or trenches which will not be back-filled immediately or will be left open and un-attended.

3.2.4 Backfilling & Clean up

NOTE 1: Ensure that warning tape and / or slaps (where required) are placed above the cables / other services when backfilling.

- a) Backfill and compact the excavations, and remove all un-used material, debris, equipment etc. from the worksite.
- b) Where cable are re-laid follow the next steps:
 - Place a 150mm thick layer of sifted soil at bottom of trench.
 - Lay cable and backfill another 300mm of sifted soil on top of cable
 - Place marking tape (ie. cable) above the cables / other services when backfilling (300mm from the top of the trench).
 - Mark cable routes and cable joints by means of cable markers above the ground.

NOTE 2: In cases of HV (44kV and above) cables, concrete slabs must be installed above cables according to SCSASACA1 & DISASACB0

3.2.5 Task wrap up

NOTE: Tools and equipment left at work place.

- a) Complete and submit required documentation
- b) Clear the work appointed supervisor
- c) Ensure that the site is safe if left unattended (appoint a guard if necessary)
- d) Remove Equipment to a safe location
- e) Remove all scrap material and store the unused ones.
- f) Ensure that excavation sites are suitably fenced off to prevent unauthorised entrance
- g) Remove all personnel, equipment and redundant material from the appointed supervisor
- h) Take a photo of the reinstated area for later proof.

3.3 Related/Supporting Documents

3.3.1 Related Documents

- a) Specifications;
- b) Critical task analysis; and
- c) Training module.

3.3.2 Forms and Records

The completed report shall be returned to the Work Management Centre together with the work order via Work co-ordinator.

The completed reports / forms must be returned to respective departments for record keeping.

- a) Works order
- b) Operating Instruction form / Workers register / Permit
- c) Pre-task assessments
- d) Risk Assessment
- e) In / Out commission sheet / Stores return
- f) Pre-task assessments.

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4. Authorization

This document has been seen and accepted by:

Name and surname	Designation
Prince Moyo	Power Delivery Engineering GM
Colin Smith	Design Base Maintenance Manager
Archie Jaykaran	SCOT/SC Chairperson
Solly Matebula	Specialized and Maintenance Manager (GOU)
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Nolan Ockhuis	Technical Support Manager (WC OU)
Ellie Mabaso	Technical Support Manager (NC OU)
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5. Revisions

This revision "240-100176167"supersedes and replaces all revisions of DMN 34-1981.

Date	Rev	Compiler	Remarks
Dec 2015	1	PA Pretorius	Register a 240 number for the document, reviewed and formatted into the new format. No content changed. The document is published as 240-100176167
March 2013	1	B Uys / DM Ntombela	Requested by KZN to include Cables and other Services in the document and sections below were revised and some new ones were added:
			5.3.1 Revised Preplanning section.
			5.3.3 Revised Site Preparation
			5.3.4 Revised Excavation
			5.3.5 Added sub-clause b) & g)
Jan 2010	0	DM Ntombela	Original issue as DMN_34-1981

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6. Development team

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

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P Diedericks	SHE Manager	FS OU
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P Ramosili	Field Services Engineer	NW OU
M Lakhan	Officer Technical Support	KZN OU
D LeRoux	Officer Technical Support	WC OU
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7. Acknowledgements

Not applicable.

Annex A – - Task Observation
(Normative)

	FORM TITLE	OBSERVATION FORM		
	FORM NUMBER	240-100176167	REV DATE	December 2020
	DOCUMENT TITLE	Excavations		

1.	OBSERVER'S PARTICULARS	<p>Task _____ observer's name: Task observed (Excavations): _____</p> <p>Section _____ / department: Location: _____</p> <p>Occupation: _____ Is there a procedure / task manual for this task? YES <input type="checkbox"/> NO <input type="checkbox"/></p> <p>Date: _____ Task Manual ref. __ 240-100176167 _____</p> <p>Time _____ with task: Work order no.: _____</p>																															
2.	REASON FOR OBSERVATION	<p>Planned: <input type="checkbox"/> Follow-up: <input type="checkbox"/></p> <p>Name of employee being observed: _____</p>																															
3.	TASK OBSERVATION	<p>Did employee adhere to the procedure/practice requirements?</p> <table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th style="width:60%;"></th> <th style="width:10%;">Yes</th> <th style="width:10%;">No</th> <th style="width:10%;">N/A</th> <th style="width:60%;"></th> <th style="width:10%;">Yes</th> <th style="width:10%;">No</th> <th style="width:10%;">N/A</th> </tr> </thead> <tbody> <tr> <td>Preplanning carried out correctly</td> <td></td> <td></td> <td></td> <td>5. Use of correct PPE</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Emergency contacts numbers Obtained</td> <td></td> <td></td> <td></td> <td>6. Ensure that the panel / equipment to be commissioned is isolated and earthed in accordance with EPC_32-846</td> <td></td> <td></td> <td></td> </tr> </tbody> </table>									Yes	No	N/A		Yes	No	N/A	Preplanning carried out correctly				5. Use of correct PPE				Emergency contacts numbers Obtained				6. Ensure that the panel / equipment to be commissioned is isolated and earthed in accordance with EPC_32-846			
	Yes	No	N/A		Yes	No	N/A																										
Preplanning carried out correctly				5. Use of correct PPE																													
Emergency contacts numbers Obtained				6. Ensure that the panel / equipment to be commissioned is isolated and earthed in accordance with EPC_32-846																													

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Tools equipment:				7. Carry out the task as per task manual (240-100176167)			
Used correctly							
In good and safe condition							
Test instrument calibrated							
Toolbox Talk:							
Task manuals used							
Complete Worker's register							
Risk Assessment been done							
Valid work permits available							
Could observed practices / conditions lead to:							
Injury:				Illness (fumes, gas, etc.)			
Risk of getting caught by				Costs (delays)			
Risk of striking against/get struck by				Poor quality (non-conformance)			
Risk of fall from same level							
Risk of fall from different level							
Risk of slip, trips and falls							
Risk of electrocution							
4.	NON COMPLIANCE PRACTICE OBSERVATION						
	Yes	No	N/A		Yes	No	N/A
1. Working at unsafe speed				7.Failure to warn			
2. Using unsafe equipment				8. Taking chances			
3. Using equipment unsafely				9. Failure to identify hazards			
4. Unsafe loading, placing & lifting				10.Failure to secure lock-out			

	5. Taking unsafe position				11. Safety signs ignored			
	6. Safety rules ignored							
NOTE: ALL OBSERVED CLASS HAZARDS SHALL REQUIRE IMMEDIATE INTERVENTION								
5.	OBSERVED DEVIATIONS / NON-CONFORMANCES							
6.	RISK BEHAVIOURS							
7.	PROPOSED CONTROLS							
	Compile a procedure for this task				Issue a standing instruction			
	Revise present procedure				Change work methods			
	Retraining of employees				Professional referral			
	Engineering revision				Coaching			
8.	ANALYSIS							
	IAC – inadequate capability		ABU – abuse or misuse / equip / drugs or alcohol		MAIN – inadequate maintenance			
	KNO – lack of knowledge		NAT – natural factors		EQU – inadequate equipment			
	SKI – lack of skill		LEA – inadequate leadership		STA – inadequate work / train Standards			
	STR – stress		ENG – inadequate engineering		WEA – wear & tear			
	MOT – improper motivation		PUR – inadequate purchasing		CON – inadequate control			

9.	DISCUSSION BETWEEN SUPERVISOR/OBSERVER AND EMPLOYEE	
	1. EMPLOYEE EXPLANATION FOR RISK BEHAVIOUR:	
	2. AGREEMENT TO CHANGE AT RISK BEHAVIOUR:	
10.	FOLLOW-UP ACTIONS	WHEN / WHO

Person being Observed signature: _____

Date:

Signature (Task Observer): _____

Date:

Signature Chairperson Safety Committee: _____

Date: _____

(if deviations were found)