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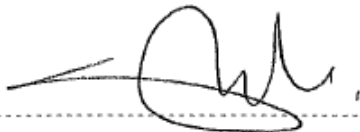
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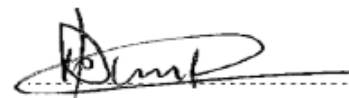
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Executive Summary

At a national work group meeting in 2013 which constituted members from the various Distribution Operating Units it was agreed that it was impractical to have one standard convention for the numbering of MV and LV poles. Furthermore the existing published standard *DST_34-1135 "MV and LV Pole Numbering"* appeared impractical for Operating Units to comply with and hence the OU's had requested that this standard be withdrawn. Standard DST_34-1439 "*Standard for the labelling of Substations and networks*" is not sufficiently detailed on the MV and LV pole numbering convention. The work group had requested that this standard be reviewed to build flexibility in the requirements for MV and LV pole numbering convention. However, discussions with DBOUS Management revealed that a review of DST_34-1439 goes beyond the scope of just MV and LV Pole numbering. Rather, let the existing standard DST_34-1135 be reviewed to build flexibility to cater for Operating Units. Hence, this document is a review of DST_34-1135.

1. Introduction

There are currently many philosophies being adopted to label both MV and LV networks. A standard labelling system is now needed for MV and LV feeder networks.

2. Supporting clauses

2.1 Scope

This document covers the labelling philosophy to be applied to all MV and LV feeder networks poles. A few options are also provided to allow for a little flexibility.

2.1.1 Purpose

The purpose of this document is to standardise the identification of MV and LV network poles throughout the Distribution Group.

2.1.2 Applicability

This standard is applicable to all MV and LV power networks.

2.2 Normative/informative references

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

2.2.1 Normative

- [1] ISO 9001 Quality Management Systems.
- [2] Occupational Health and Safety Act, 1993 (Act 85 of 1993)
- [3] 240-114967625: Operating regulations for high-voltage systems (ORHVS).
- [4] SANS 507-1:2007/NRS 034-1:2007 Electricity Distribution - Guidelines for the provision of electricity distribution networks in residential areas, Part 1 - Planning and design of distribution networks
- [5] 240-120804300: Standard for the labelling of High Voltage equipment.
- [6] 240-75660336: Specification for high voltage equipment labels
- [7] 240-133791951: Maintenance Inspection and Supplemental Treatment of Treated Wood Utility Poles
- [8] Risk Assessment (ISO 31000),
- [9] Integrated Risk Management (IRM)

2.2.2 Informative

None

2.3 Definitions

2.3.1 General

All definitions in the ORHVS and ORLVS shall apply.

Definition	Description
Structure	NRS 000: Construction of wood, concrete or steel used in a line to support conductors or cables (or both) and associated accessories and equipment above the ground.
Pole	Means a single supporting member of a structure on or planted in the ground.
Pole Number:	A number that uniquely identifies each pole installed in a utility structure. 240-133791951 requires that not only structures be identified but also each pole be uniquely identified in order to facilitate pole marking for replacement or maintenance thereof.

2.3.2 Disclosure classification

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

2.4 Abbreviations

Abbreviation	Description
DBOUS	Design Base and Operating Unit Support
LV	Low Voltage: All voltages below 1000V (ph – ph)
MV	Medium Voltage
OU	Operating Unit

2.5 Roles and responsibilities

Not applicable.

2.6 Process for monitoring

Not applicable.

2.7 Related/supporting documents

Not applicable.

3. Requirements

3.1 Basic Principles for MV and LV Pole labelling

- a) There is a need to comply with Statutory and Eskom minimum requirements.
- b) All documents with reference to MV and LV Pole labelling shall align to them.

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3.2 Statutory Requirements

- a) According to SANS 507-1:2007/NRS 034-1:2007 - Planning and design of distribution networks, the following section refers:

“6. Inspection and tests

Before being energized, the system shall be inspected for compliance with legislation (see foreword), and with any other national or local regulations (see foreword). The system should also be inspected to ensure that all requirements for safety, labelling, and warning signs, etc., have been complied with, and that all poles carry identity discs.

All labels should be permanent, indelible and, where appropriate, of a size that is legible from ground level.”

- b) According to Eskom’s Operating Regulations for High Voltage Systems 240-114967625:

“7.02.3.2 Issue of a live work declaration form: “The **authorised person** in charge of **live work**, to whom the **control officer** has handed over **apparatus** for **live work**, shall explain to all the persons who will be engaged in the **live work** the arrangements made with the **control officer**. The **authorised person** in charge of the **live work** shall: a) identify the **apparatus** to be **worked on**”,

And

“1.02 **Apparatus** means any generator, transformer, motor, switchgear, isolator, **feeder**, electrostatic precipitator or any other high-voltage plant installed in a station”.

And

“1.31 **Feeder** means a **line** or cable in or from power stations or substations”.

And

“1.42 **Line** means an exposed overhead feeder, and includes the supports and all terminal equipment up to but excluding the line isolator, transfer or bypass isolators and line earth switches”.

And

“2.03.1.2 “The **operating instruction form** shall be taken to the place where the **operating** is to be carried out and the instructions shall be read by the **authorised person** carrying out the **operating**, who shall check that the **apparatus** and the intended **operating** corresponds with the written instruction before the **operating** detailed on it is commenced”.

The above National standard and Eskom regulations stipulate safety compliance requirements.

3.3 Other Eskom Requirements

- a) MV and LV pole labelling shall be logical or sequential.
- b) All other associated business imperatives together with this standard shall be met with, within reason.

3.3.1 Roles and responsibilities

It is the responsibility of the Provincial General Manager or his delegate to ensure that all MV and LV network poles are labelled and numbered in accordance with this standard.

3.3.2 Registration of substation and line codes

In order to avoid duplication, all feeder names and codes shall be registered with the Operating Unit Network Planning Manager, Network Engineering Design Manager and Plant Management Manager.

3.3.3 Philosophy of pole labelling

There is a basic philosophy to follow when labelling poles:

- a) Firstly identify the feeder / network name.
- b) Then identify the pole in accordance with the requirements in 3.3 above.
- c) Where multiple T- offs emanate from one structure, an A, B, C, etc. suffix to the originating pole number will precede the next pole number on the T-off. Various labelling philosophy options are depicted in Annexes A – E.

3.3.4 Pole Identification of Overhead Systems

- a) Pole / structure labels shall be fitted 1.8 metres above ground level. The label shall not be placed over any other pole labelling tag on the structure.
- b) Pole / structure identification numbers must be clearly and indelibly stamped onto an aluminium plate.
- c) The aluminium plate shall be as per Eskom specification D-DT – 3049 (SAP number 0172393). That is size to be 150mm long x 25mm wide x 0.9mm thick.
- d) The size of labelling shall be 6mm in height.

Note: Person's installing pole number labels onto energized structures shall not leave ground level.

3.3.5 MV Pole / structure identification

- a) All poles / structures shall be uniquely identified in accordance with the philosophy of labelling.(See 3.3.3 above).
- b) All labels shall be alpha numeric.
- c) Multiple pole structures in one location are to be considered as a single structure and given a single structure (pole) number that shall be attached to one pole. The other poles in that one location shall have the same pole number, but with an additional unique identifier such as alphabets A, B or C at the end of each respective pole number.
- d) Where LV and MV are on a common pole / structure the MV label is used. However where it can assist in the identification of LV circuits and / or customers a separate LV label can also be affixed.
- e) Where operating equipment is mounted on a pole / structure the equipment label is in addition to the pole / structure identification label.
- f) See Annex A - E for options of labelling conventions.

3.3.6 LV Pole / structure identification

- a) All poles / structures shall be uniquely identified in accordance with the philosophy of labelling.(See 3.3.3 above). The MV network feeder name may not necessarily apply to LV labels. Operating Units may substitute the feeder / network name with the MV/LV transformer unique alpha numeric prefix in the LV pole number label.
- b) Where a Medium Voltage line segment terminates on a Transformer with a Low Voltage winding that feeds an extended Low Voltage network, a T (i.e. for Transformer) may precede the Low Voltage pole labelling which will follow the same logic as for the Medium Voltage pole labelling sequence.
- c) Where LV and MV are on a common pole / structure the MV label is used. However where it can assist in the identification of LV circuits and / or customers a separate LV label can also be affixed.
- d) Discretion shall be exercised with respect to labelling of 5m stubby poles and or poles with flying stay arrangements.
- e) See Annex A - E for options of labelling conventions.

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4. Authorization

This document has been seen and accepted by:

Name and surname	Designation
Amelia Mtshali	Senior Manager, Design Base and Operating Unit Support
Andre Bekker	Middle Manager Design Base Maintenance
Ajith Persadh	Senior Technologist Design Base Maintenance

5. Revisions

This revision cancels and replaces **DST_34-1135**.

Date	Rev	Compiler	Remarks
March 2020	2	Ajith Persadh	The use of a slash ("/") from Annex A, Option 1 is replaced with a hyphen ("-"). The "/" can be confused with a "1" or a "7". Replaced the word "numbering" with "labelling" 3.3.6d) edited to say "Discretion shall be exercised with respect to numbering of 5m stubby poles and or poles with flying stay arrangements." Added Option 4 for KZN OU
Jan 2015	1	Ajith Persadh	New "240" number now replaces "DST_34" numbers This document replaces DST_34-1135 Principles (i.e. Statutory and Eskom requirements) added in requirements Flexibility now built in by way of options of accepted numbering conventions from a few OU's.

6. Development team

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

- Ajith Persadh
- Colin Smith
- Koos Krafft
- Derrick Wells
- Bruce McLaren
- Nkateko Khoza
- Osie Oosthuizen
- Eze Van Tonder
- Shalen Goonoa
- Cintesh Samjowan
- Masithembe Ngcwama
- Gordon Howie

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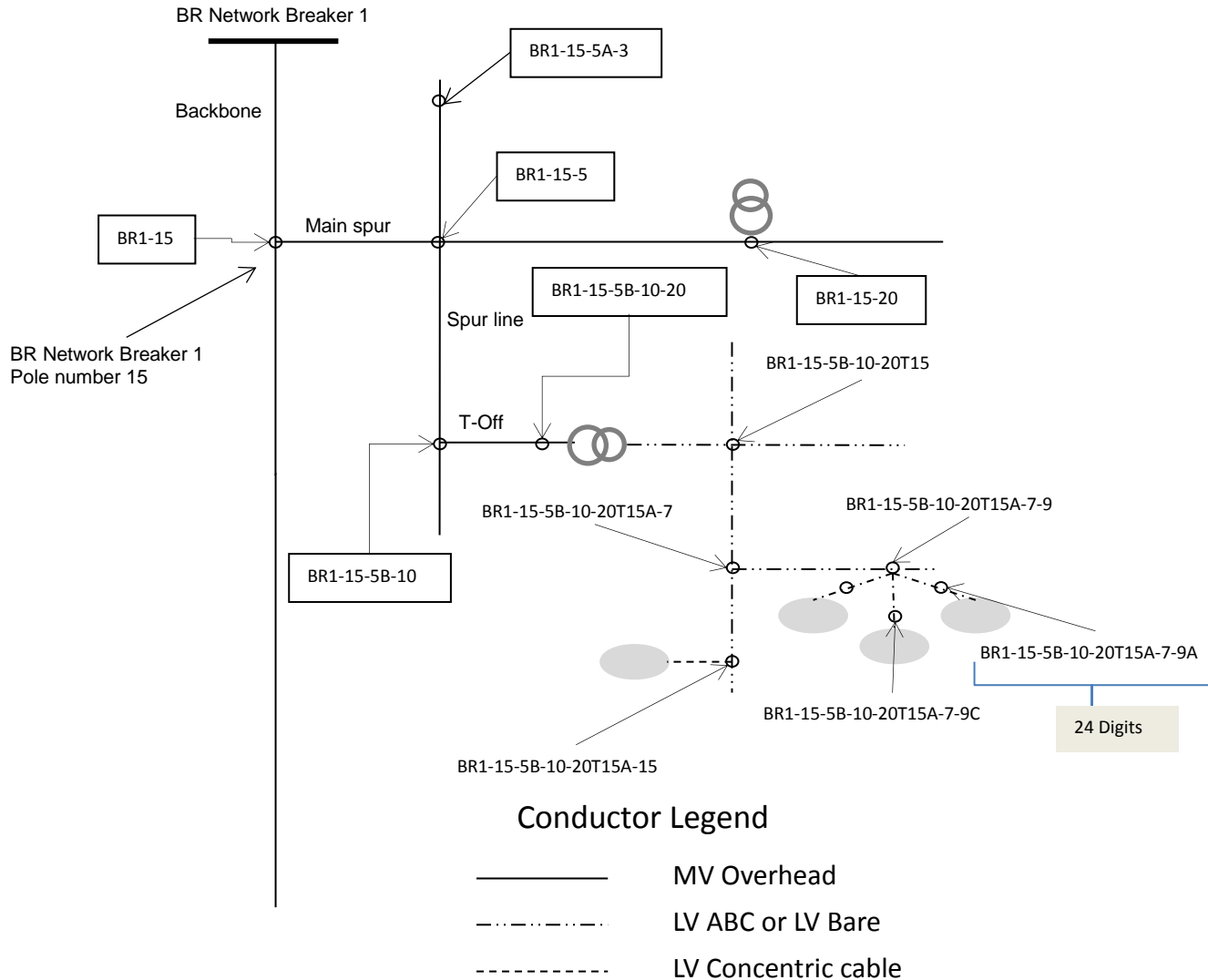
- Basie Botha

7. Acknowledgements

- All Operating Units

Annex A – Option 1 - MV & LV Pole labelling philosophy

Informative:



Explanation of the numbering rationale above

The numbering rationale is illustrated with reference to the diagram of an imaginary Medium to Low Voltage Network depicted above.

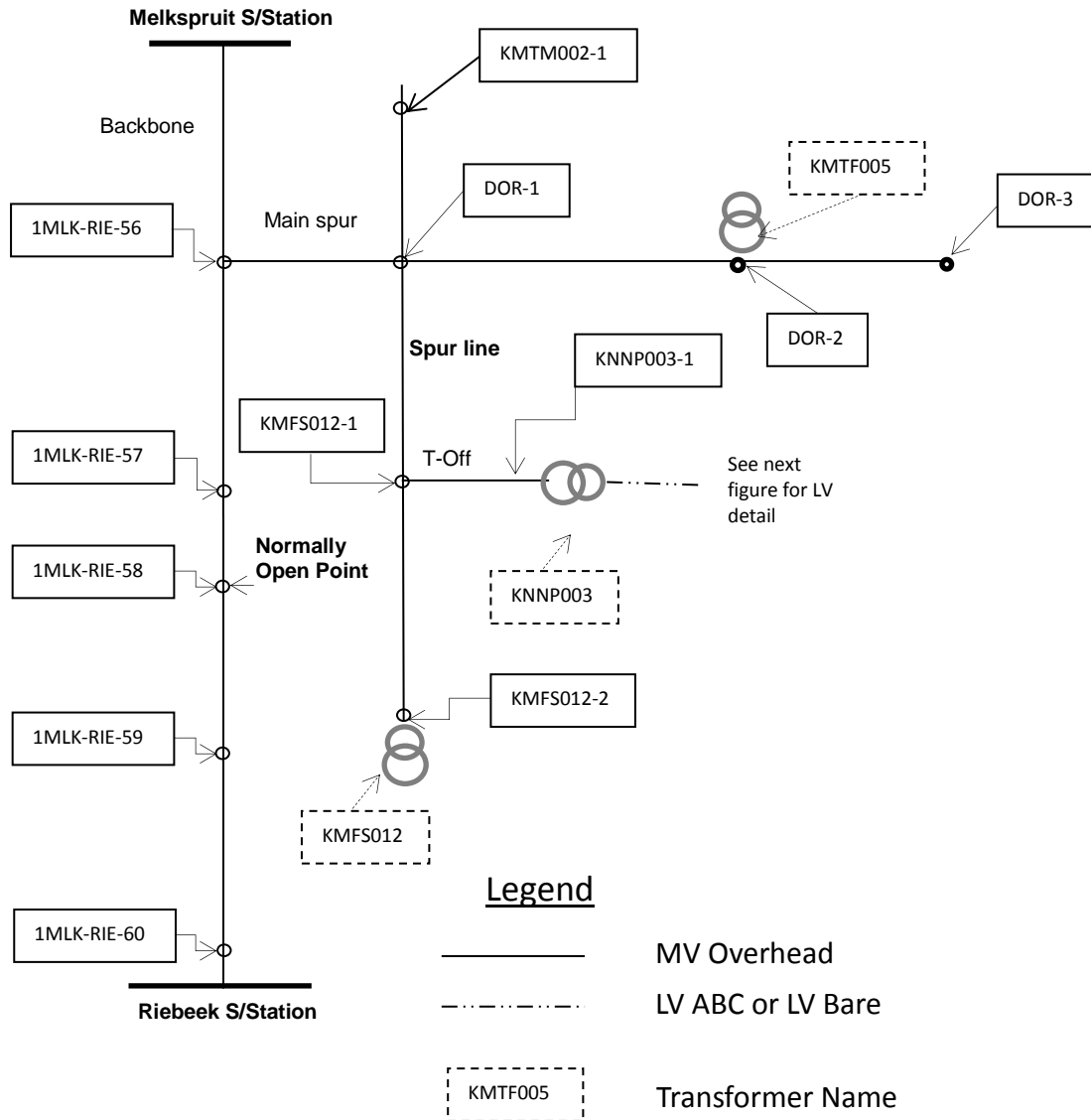
- a) The pole number prefix for the line will be abbreviated from the line name as designated by Land Development, consistent with this standard.
- b) The pole numbers of the MV line emanating from the bus bar shall follow a sequential number following the abbreviated line name as in (a) above.
- c) The next pole on every T-off (single direction) will be indicated by a hyphen (-) separating the number of the originating pole, and the first pole on the T-off. This first pole will be designated 1 and the next poles sequentially numbered to the end of the T-off line. (See BR1-15- spur in example above).
- d) The next poles on a multi T-off (see BR1-15-5) must discriminate the feeder sections to either side of the T-off with an A for the one and a B for the second line segment to uniquely number the poles. See BR1-15-5A and BR1-15-5B spurs in example.

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- e) Still on the MV line and following the B- spur, the next T-off will be treated as in c) or d) above.
- f) The LV network beyond the pole will be prefixed by a T (for Transformer) between the pole number on which the transformer is installed and the first LV network pole. The LV numbering system will then reflect the rationale for the MV line as indicated. (See BR1-15-5B-10-20T-15A-7-9A in diagram above)

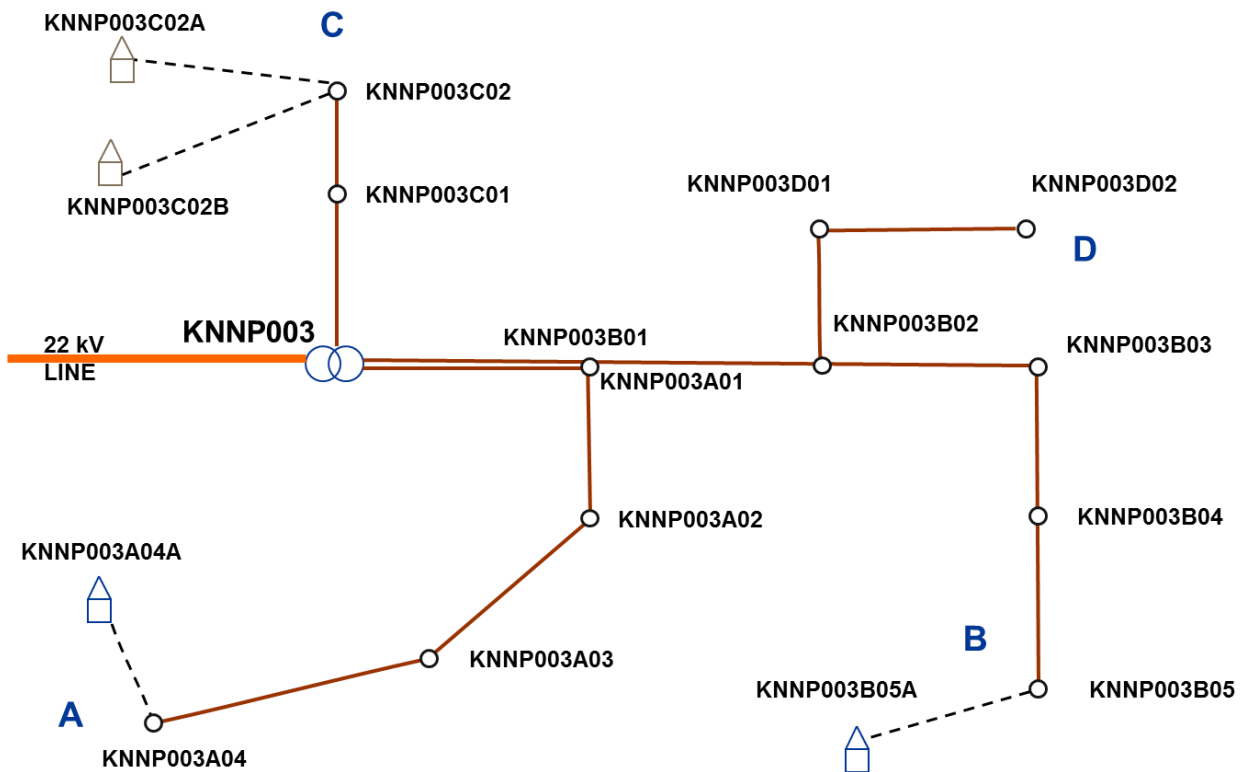
**Annex B – Option 2 – MV & LV Pole labelling philosophy: (Eastern Cape OU)
Transformer name for Life principle**

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Explanation of the labelling rationale above

The labelling rationale is illustrated with reference to the diagram of an imaginary Medium to Low Voltage Network depicted above.

- a) All structures numbered or named including Ring Main Units and Mini-sub
- b) Structure Number = "Prefix-#" where # is numerical series of 1 to n
- c) A hyphen ("-") separator shall be used to separate the network alphanumeric name and pole numbers,
- d) Mainline Prefix (Made up of 3 characters based on the substation name/s and Area)
 - 1) Sub to Sub Multi-Source – Sub A – Sub B (Alphabetical)
 - 2) Sub to Sub Single-Source - From-To (Source-Load)
 - 3) Sub to Area - From-To (Source-Load)
 - 4) Multiple Circuits - #Prefix where # circuit number

Note: Same prefix for all lines relating to a sub

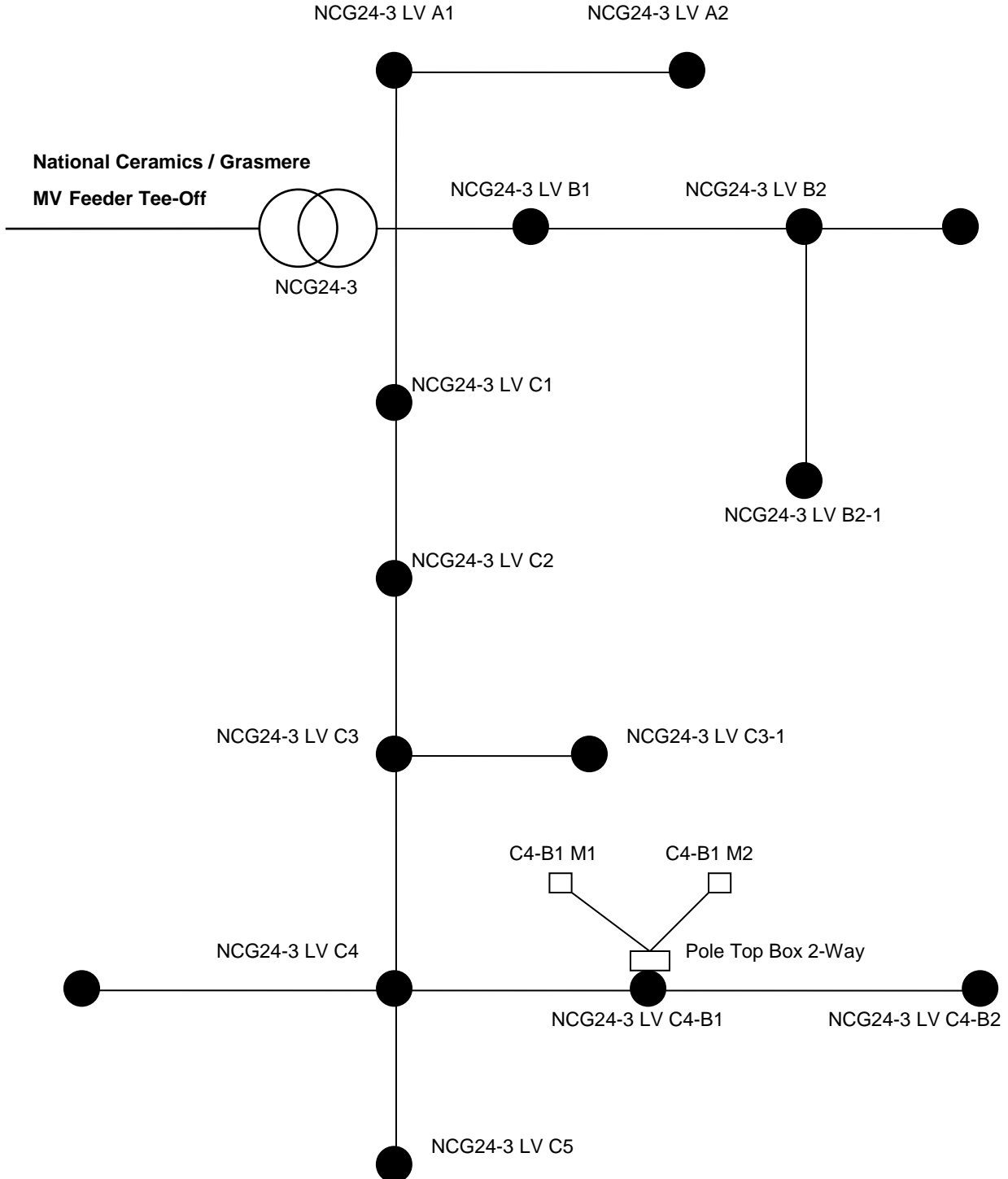
- e) Main Spur Prefix – Use an Area code/Abbreviation
- f) Spur Line Prefix – Use the end Transformer Number
- g) RMU & Mini-sub – Number/Name only
- h) Link Line – add -L- after the prefix and before the incremental number
- i) For LV circuits the structure naming format = "Trfr No" "LV Feeder" "Structure" e.g. KNNP003A04 for the LV structure, which could also be a kiosk. The LV Feeder value is for a single continuous run of LV fed from a single transformer. Branches off of the LV line are then treated as new feeder, or spur lines and thus are allocated a new feeder letter.

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- j) The customer connections are then in the format = "Trfr No" "LV Feeder" "Structure" "Service Number" e.g. **KNNP003A04A** for the service connection at the LV pole **KNNP003A04**
- k) Structure numbering to be per circuit i.e. structures carrying more than one circuit will have labelling for each circuit (place label on the same side of circuit or in same order where vertically aligned);
- l) In the event a new structure is inserted into an already numbered MV line use an Alpha value after the incremental number as a postfix in such a way that it is:
 - 1) After the number but before the next bigger number e.g. 54, 55, 55A, 55B, 56, 57 etc.
 - 2) Such a structure with an alpha value as a postfix may not have any operating, or switching devices

Annex C – Option 3 – LV Pole labelling philosophy

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Annex D – Option 4 - MV & LV Pole labelling philosophy (KZN OU)

- a) Firstly, identify the feeder or network alphanumeric name,
- b) Secondly, identify the unique pole number logically or sequentially,
- c) A hyphen (“-”) separator shall be used to separate the network alphanumeric name and pole numbers,
- d) The first MV pole/structure from a source substation is considered “pole one”; every MV pole thereafter shall be labelled in sequence e.g. GDL30-1, GDL30-2, GDL30-3, GDL30-4 etc.,
- e) Each pole label shall be clearly and indelibly stamped onto an aluminium plate (SAP #172393) and positioned suitably 1.8 m above ground level,
- f) The size of alphanumeric labelling stamped shall be a minimum of 6 mm in height,
- g) Where MV and LV are on a common pole the MV label is to be used. However where it can assist in identification of LV circuits and or customers a separate LV pole label can be installed,
- h) Multiple MV pole structures in one location shall be considered as a single structure and given a unique “main” pole label to be attached to one pole, all other accompanying poles shall have an alphabetic suffix (e.g. A, B, C) appended to this pole label to help with identification thereof,
- i) Each MV “T-off” pole from a structure shall have a suffix “-1” appended to the “main” pole label e.g. GDL30-4-1, THOR30-10-2-1 etc., every MV pole thereafter shall be labelled in sequence,
- j) Where multiple “T-offs” emanates from one structure, an alphabetic suffix “A” shall be appended to the “main” pole label preceding the “-1” suffix e.g. GDL30-4A-1,
- k) Where an additional MV pole is introduced in-between existing MV pole structures these shall have an alphabetic suffix “Z” or “-Z” added to the preceding the MV pole label e.g. GDL30-1Z.

Note: The feeder or network alpha acronym can be acquired via ENS or Smallworld

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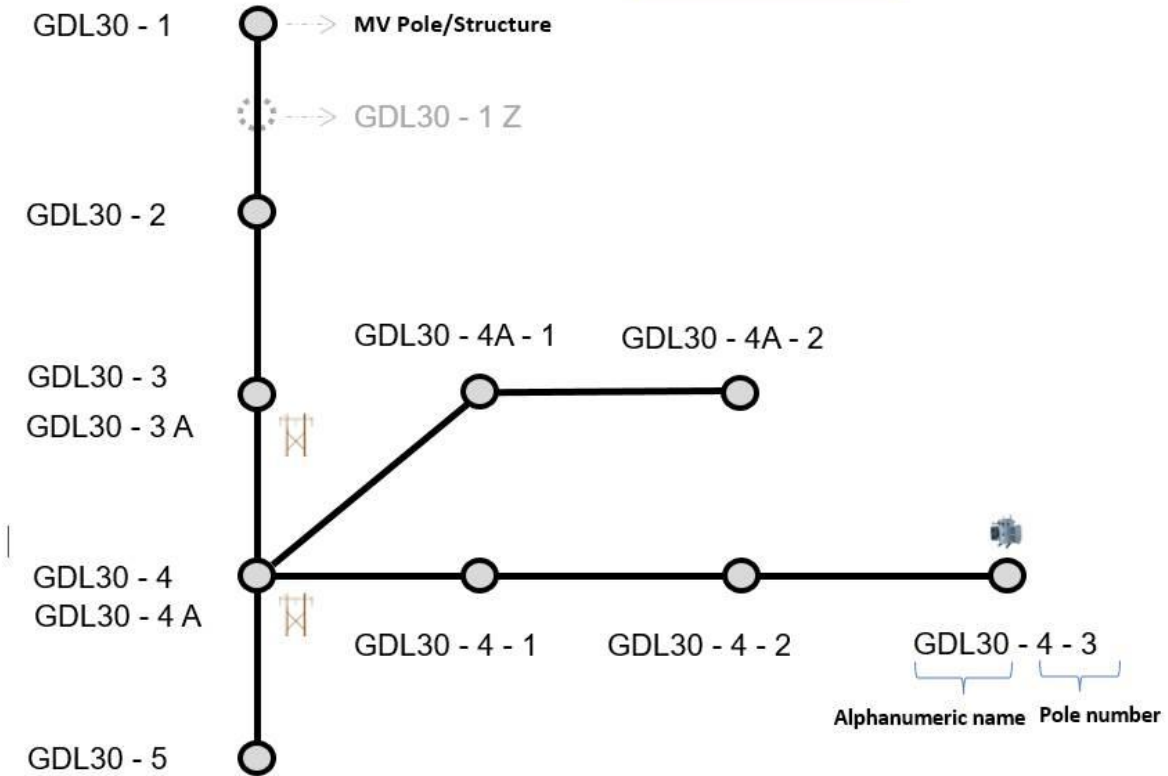
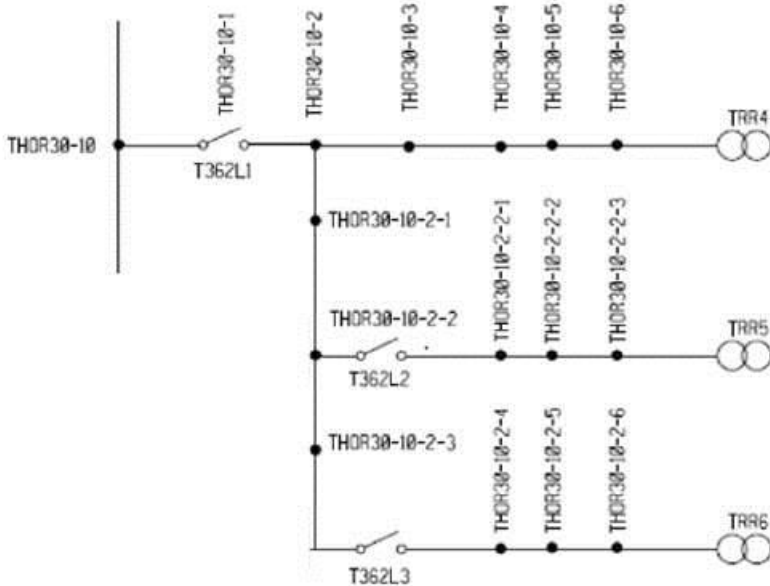


Illustration of MV Pole Labelling



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Illustration of MV Pole Labelling for T-offs

An option for labelling LV poles or structures is as follows:

- a) Firstly, identify the source MV/LV transformer, i.e. the transformer unique alphanumeric prefix name,
- b) Secondly, identify the separate feeders suffix (i.e. A, B, C or D) and unique pole number logically or sequentially;
- c) A hyphen (“-”) separator shall be used primarily for LV “T-offs”,
- d) The first LV first feeder pole from a source transformer is considered “pole one”; every LV pole thereafter shall be labelled in sequence e.g. NGY23 **A1**, NGY23 **A2** etc.,
- e) Each pole label shall be clearly and indelibly stamped onto an aluminium plate (SAP #172393) and positioned suitably 1.8 m above ground level,
- f) The size of alphanumeric labelling stamped shall be a minimum of 6 mm in height,
- g) Where MV and LV are on a common pole the MV label is to be used. However where it can assist in identification of LV circuits and or customers a separate LV pole label can be installed,
- h) Where an additional LV pole is introduced in-between existing LV poles these shall have an alphabetic suffix “Z” added to the preceding the LV pole label e.g. NGY23 **A1Z**,
- i) Each LV “T-off” pole from a structure shall have a suffix “-1” appended to the “main” LV pole label e.g. NGY23 **A3-1** etc. every LV pole thereafter shall be labelled in sequence,
- j) Where multiple “T-offs” emanates from one structure, a corresponding alphabetic feeder suffix (i.e. A, B, C or D) shall be incorporated to the “main” LV pole label e.g. NGY23 **A3-A1**,
- k) The **LV service pole** labels or LV poles preceding the customers’ house shall generally contain the transformer unique alphanumeric prefix name; the corresponding alpha feeder suffix (i.e. A, B, C or D), the separator “H” and the customer house number e.g. NGY23 **BH49**, NGY23 **AH50**, NGY23 **AH51** etc.

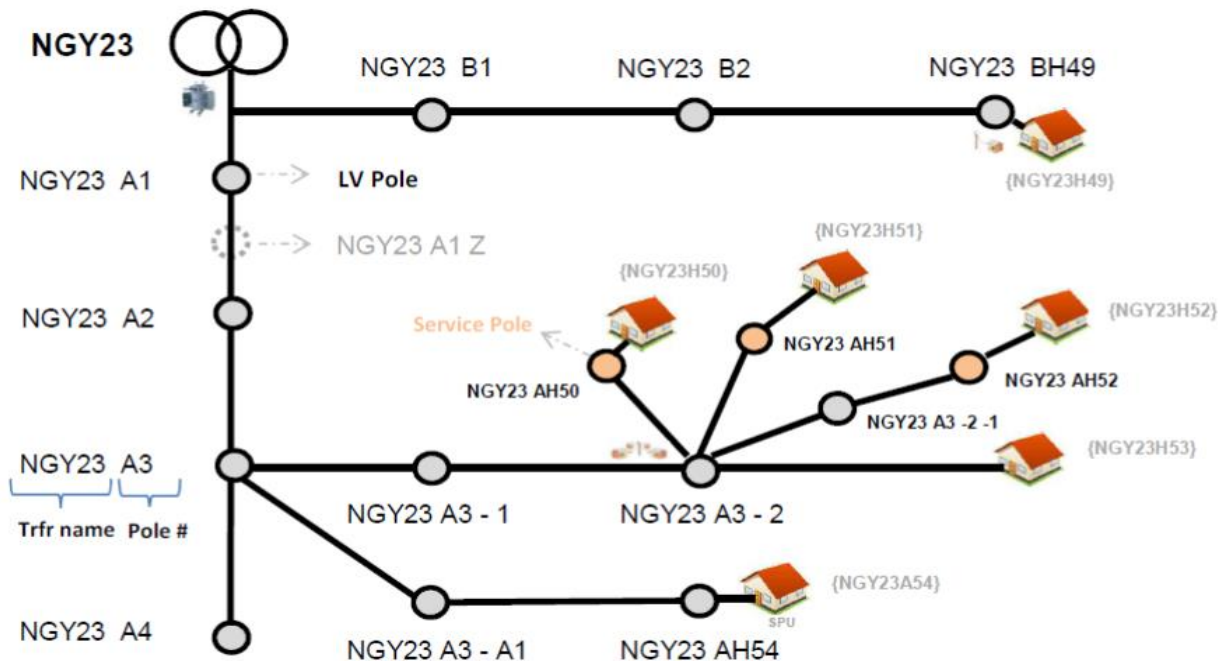


Illustration of Trfr Zone and LV Pole Labelling

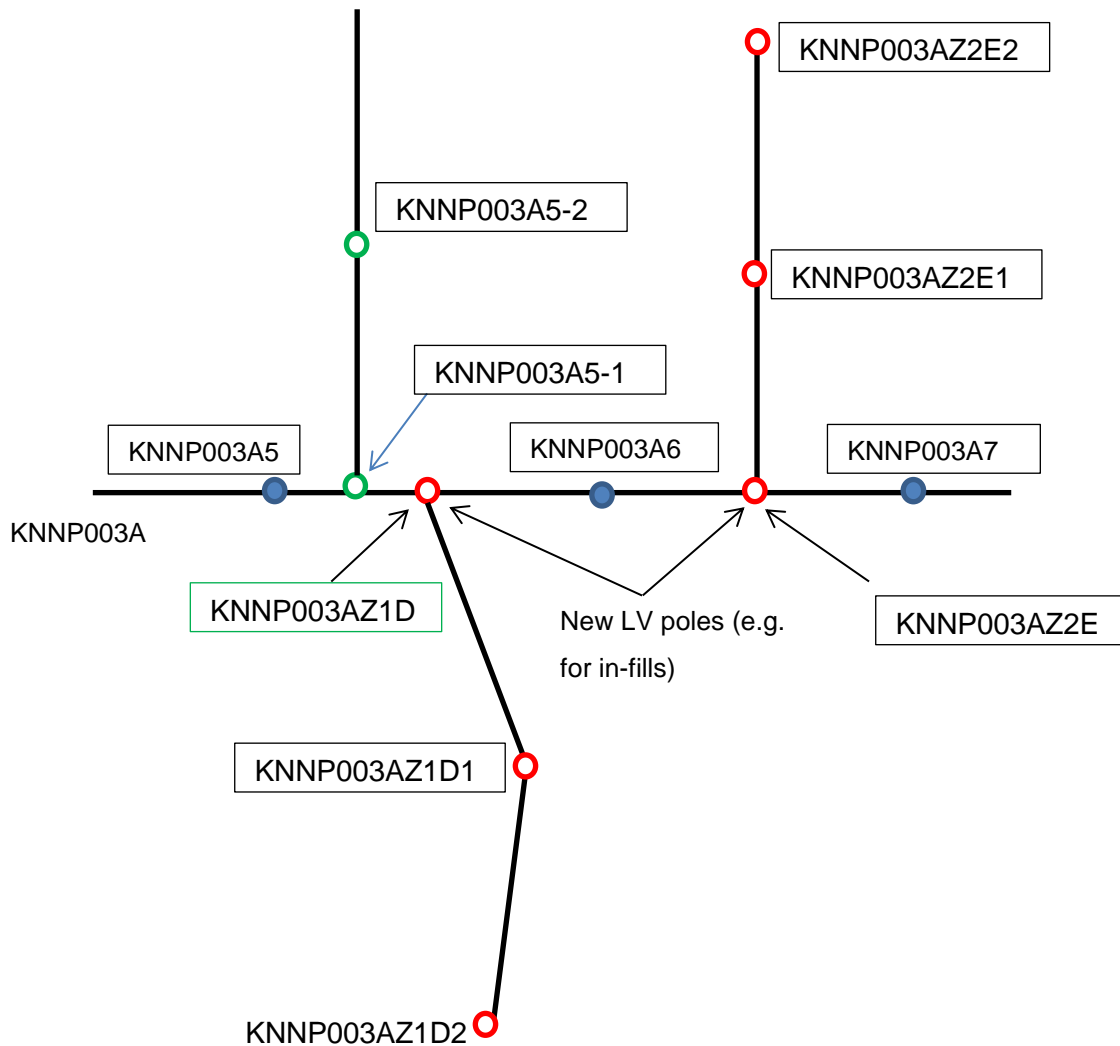
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Annex E – LV Pole labelling philosophy for new Tee – offs / additional poles

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Notes:

- a) KNNP003A describes feeder A from Transformer zone KNNP003
- b) For new LV poles the incremental value is **Z#alphabet** where # represents incremental numbers from 1 onwards followed by the next available alphabet that describes the next Tee – off or feeder, example KNNP003AZ1D
- c) Should there be another new Tee – off between say pole KNNP003A5 and KNNP003AZ1D, then that Tee – off pole shall be labelled with reference to the preceding pole number KNNP003A5. That is, KNNP003A5-1.



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