



## TRANSMISSION SPECIFICATION

TITLE: **DESIGN, MANUFACTURING AND  
INSTALLATION SPECIFICATION FOR  
TRANSMISSION LINES LABELS**

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**TRMSCABC9                      0**  
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## **Foreword**

This specification supersedes the following documents:

TRMSCAAC5- Design and manufacture of labels for Transmission lines and substations.

## **1 Scope**

The purpose of this specification is to detail the design, manufacturing and installation of Transmission line labels. This specification does not cover any sub-station labels.

## **2 Normative references**

The following documents contain provisions that, through reference in the text, constitute requirements of this specification. 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 specification 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.

SABS ISO 1461:1991, *Hot-dip galvanised coatings on fabricated iron and steel articles: specification and test methods*.

SABS 1091:1975, *National colour standards for paint*.

## **3 Definitions**

**3.1 substrate:** The type of material used to manufacture labels.

**3.2 line crossing label:** A label used on the bridge or leg of a tower to notify or warn airborne inspectors of a line crossing ahead.

**3.3 line designation label** A label placed at the start and end of a line which identifies the designation and line number.

**3.4 tower label:** A label, which identifies the line and the number of the tower/pole.

## **4 Requirements**

### **4.1 General**

Labelling is a statutory requirement of the Occupational Health and Safety Act (OHS Act) No. 85 of 1993. The act states that all controlling apparatus shall be permanently marked so as to identify the system or part of the system it is made up of.

### **4.2 Responsibility**

#### **4.2.1 Eskom's responsibility**

**4.2.1.1** The Project Manager or his delegate shall ensure that all labels comply with the requirements of this specification.

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**4.2.1.2** The orientation of the label (vertical or horizontal) shall be manufactured in accordance with the Regional Line operator's preference.

#### **4.2.2 Contractor's/Supplier's responsibility**

Nothing in this specification shall lessen the obligations of the supplier that are detailed in any other document forming part of a contract.

#### **4.3 Eskom approval**

**4.3.1** Prior to manufacturing of the labels, a complete sample label ready for installation, shall be prepared by the manufacturer and submitted to Eskom for approval.

**4.3.2** The supplier shall be fully responsible for his product and the performance in service. Approval by Eskom does not relieve the supplier of the responsibility for the adequacy of the product, dimensions and details.

**4.3.3** Manufacturer's catalogues shall not refer to any product as "Eskom approved". Eskom may only be mentioned as a reference.

#### **4.4 Design requirements for transmission line labels**

##### **4.4.1 Tower labels**

###### **4.4.1.1 Substrate**

All tower labels shall be made of a material approved by Eskom. Preference is given to the use of Iscor Chromadek and vitreous enamel, but if any other material offers the same or higher quality than the preferred listed above, then this new material will be considered.

- a) The Chromadek label shall have a minimum guaranteed life of 10 years and the vitreous enamel labels a minimum guaranteed life of 25 years.
- b) The Iscor Chromadek label shall be 0,6 mm thick with a minimum gloss of 75 %, while the substrate used for the vitreous enamel shall be cold rolled sheets from 1,2 mm to 1,6 mm thick.
- c) All labels supplied shall have a standard background colour of **GOLDEN YELLOW: SABS B49** in accordance with SABS 1091.

###### **4.4.1.2 Size and length of label**

The tower label shall be manufactured in accordance with the drawings in annexes 1 and 2. The label shall have slots for the banded straps. The details of these slots are shown in the drawings in annexes 1 and 2. Label sizes and slots shall be manufactured as indicated on the relevant drawings.

###### **4.4.1.3 Legends**

**4.4.1.3.1** Plain block letters (**HELVETICA MEDIUM**) shall be used for the legend. The inscription shall be detailed in the Works Information of the relevant contract.

**4.4.1.3.2** The legend sizes shall be as indicated in the table below.

| <b>Legend</b>              | <b>Size</b> |
|----------------------------|-------------|
| 1 Line number designation  | 75 mm       |
| 2 Line name designation    | 75 mm       |
| 3 Tower number designation | 140 mm      |

**4.4.1.3.3** The legends for the Chromodek labels shall use **3M Scotchal 7725-12** lettering or equivalent. The equivalent lettering shall be subject to Eskom approval.

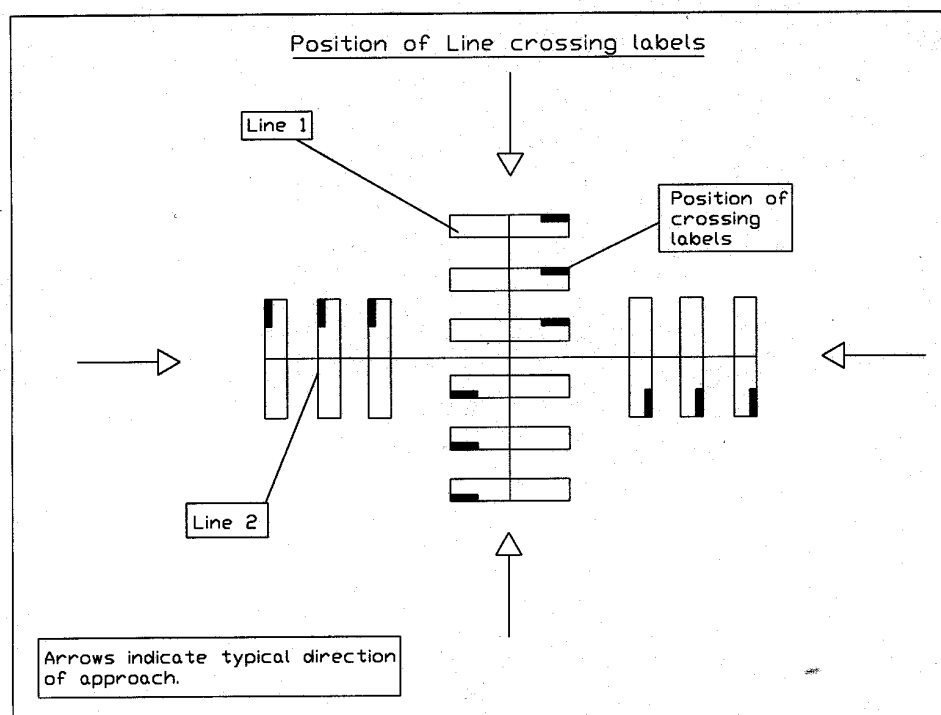
#### **4.4.2 Line crossing label**

##### **4.4.2.1 Philosophy of the line crossing label**

A line crossing label shall be attached to each transverse face of the bridge, on the first, second and third poles/ towers on all sides of a crossing as indicated in the drawing below.

Line crossing labels shall be used when:

- a) one line crosses over another line
- b) two lines converge to run parallel with each other in a single servitude
- c) there are tee-off points
- d) there is a situation that could pose a danger to a helicopter during inspections.



##### **4.4.2.2 Substrate**

The line crossing labels shall be manufactured in accordance with the drawing in annex 3.

##### **4.4.2.3 Legends and background**

The line-crossing label shall contain a cross, that shall have a minimum width of 70 mm. This label shall be covered with Scotchlite reflective sheeting, fluorescent diamond grade. The reflective sheeting shall be **LIME YELLOW (3M Ref. .No 3963)**.

#### **4.4.3 Line designation labels**

##### **4.4.3.1 Substrate**

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The substrate used shall be exactly as that specified for the tower label in 4.3.1.1. The line designation label shall be manufactured in accordance with the details specified in annex 4 or 4A.

#### **4.4.3.2 Size and length of line designation label**

See annex 4 or 4A.

#### **4.4.3.3 Legends for line designation labels**

**4.4.3.3.1** Plain block letters (**HELVETICA MEDIUM**) shall be used for the legend. The inscription shall be detailed in the Works Information of the relevant contract.

**4.4.3.3.2** The legend shall be 150 mm high.

**4.4.3.3.3** The legends for the Chromodek labels shall use **3M Scotchal 7725-12** lettering or equivalent. The equivalent lettering shall be subject to Eskom approval.

#### **4.4.4 Lettering**

No abbreviations shall be used on the labels. The lettering used on the line labels shall be approved before manufacturing begins. The lettering shall start with the first letter of the power station or substation in alphabetical order. The letters to be used shall be as follows:

- a) When a line is between two power stations or HV Yards – the first **two** letters of each power station, shall be used starting with the station having alphabetical precedence.

Example: Duvha- Majuba = **DU/MA**

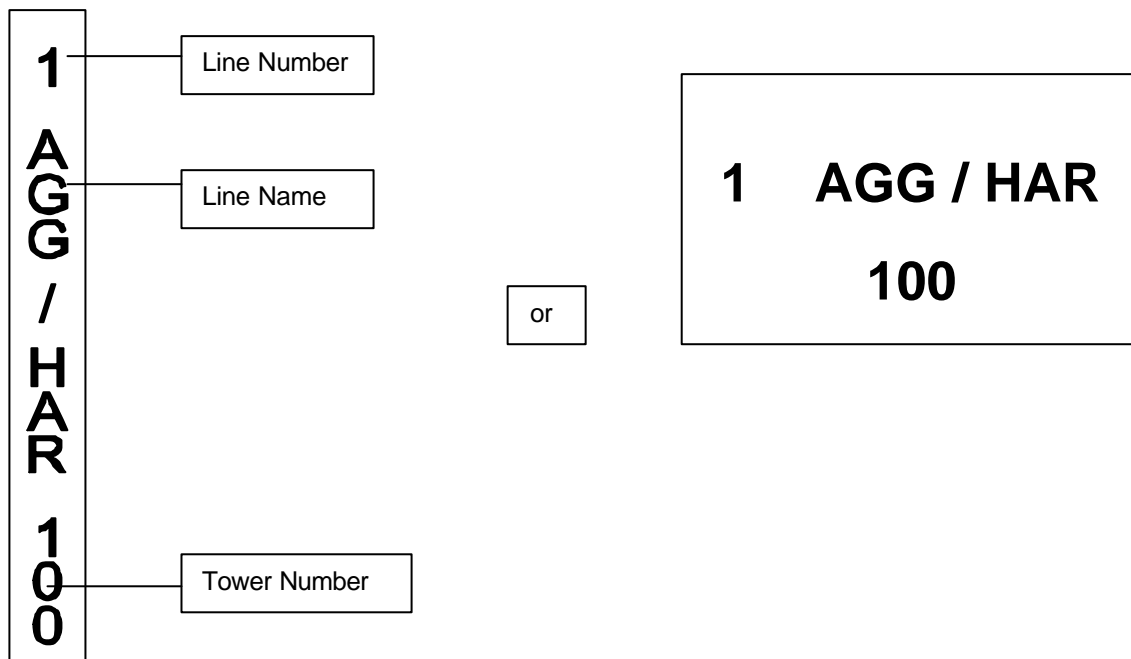
- b) When a line is between a power station and a substation – the first two letters of the power station shall be used followed by the first **three** letters of the substation.

Example: Majuba- Klaarwater = **MA/KLA**

- c) When a line is between two substations – the first **three** letters of each substation, shall be used starting with the substation having alphabetical precedence.

Example: Sol- Zeus = **SOL/ZEU**

Example: If the line name is, **Aggeneis Harib No 1**, at tower 100, the label shall read as follows:



## **4.5 Installation of labels on towers**

### **4.5.1 Position of tower labels on tower**

**4.5.1.1** All line labels shall be positioned on the tower at a height easily viewed from both the ground and air (typically from a helicopter during aerial inspections). This height shall correspond roughly to the lowest conductor height and be near the waist in the case of lattice towers.

When positioning labels, maintenance requirements shall be considered. The label shall be positioned so that maintenance or replacement are possible without interfering with the line operation.

Annex 5 shows the basic positions of the tower labels for different tower types.

**4.5.1.2** Only one tower label will be supplied for each tower. The labels shall be positioned so that all odd numbers face the direction of the substation having alphabetical precedence and that all even numbers face the other substation.

### **4.5.2 Methods of attaching labels to towers**

All labels shall be attached to the tower using three stainless steel banded straps inserted through slots in the labels. The label shall then be attached to a member of the tower in the specified position. The most common size of strap to be used shall be the 12,7 mm × 0,7 mm strap. The contractor shall ensure that all straps used are tightened evenly without damaging or distorting the label. All strap buckles are stainless steel.

Care shall be taken not to damage or chip the vitreous enamel labels during transport and installation.

### **4.5.3 Position of line crossing labels on tower**

All line crossing labels shall be positioned on the tower bridge where they will be clearly visible from the helicopter or aircraft. On crossrope suspension towers, the crossing labels shall be fitted as high as practical on one leg. The position of the crossing label on the crossrope tower should be at least within the first ¼ of the entire length of the leg from the top. As the pilots in the majority of helicopters sit on the

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right hand side, labels shall be fitted on the left hand side of the tower when facing in the direction of flight that will encounter the crossing.

When positioning labels, maintenance requirements shall be considered. The label shall be positioned so that maintenance or replacement are possible without interfering with the line operation.

#### **4.5.4 Methods of attaching line crossing labels to towers**

All line crossing labels shall be attached to the tower using three stainless steel banded straps inserted through chain links welded to 10 mm round bars attached onto the frame of the label. The label shall then be attached to a member of the tower in the specified position. The most common size of strap to be used shall be 12,7 mm × 0,7 mm strap. The contractor shall ensure that all straps used are tightened evenly without damaging or distorting the label. All strap buckles shall be stainless steel.

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**Annex A**  
(informative)

**List of drawings**

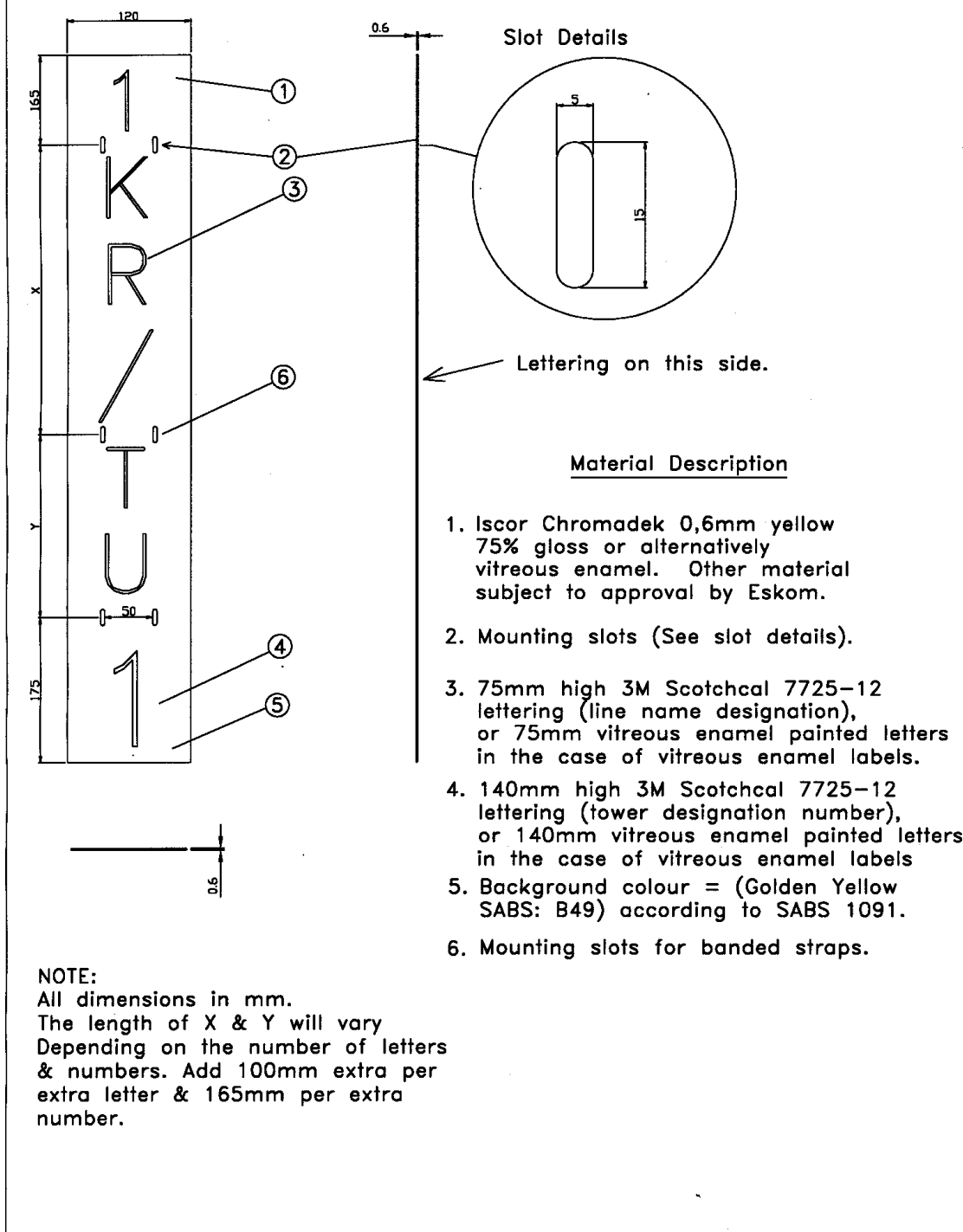
The following drawings form part of this annex:

| <b>Number</b> | <b>Title</b>  |
|---------------|---|
| 1             | Tower label for Transmission lines- Vertical configuration    |
| 2             | Tower label for Transmission lines- Horizontal configuration. |
| 3             | Line crossing labels.   |
| 4             | Line designation labels.                                      |
| 4A            | Line designation labels- Vitreous Enamel substrate.           |
| 5             | Position of labels on towers.                                 |



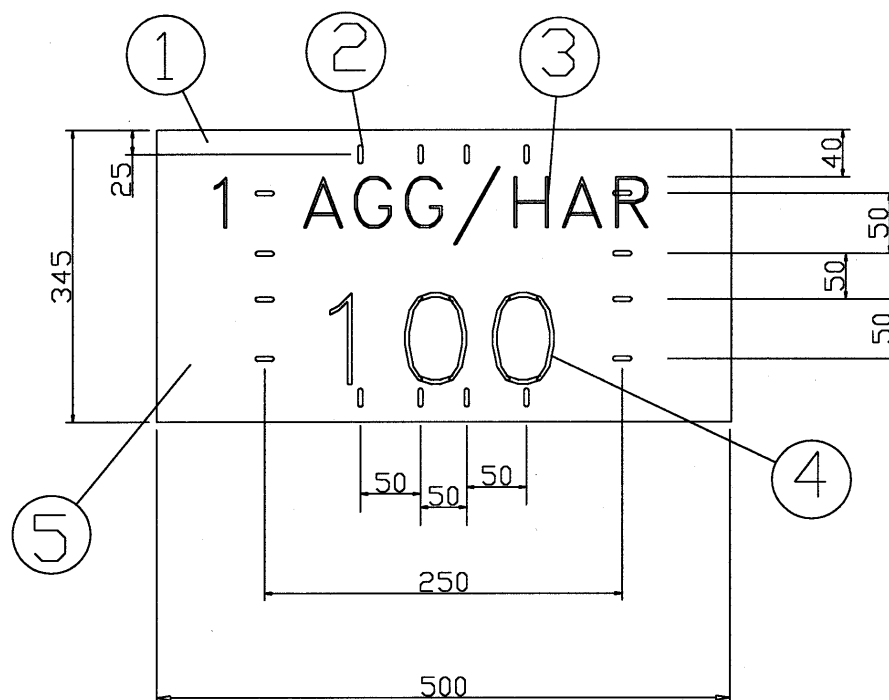
## ANNEXE 1

### Tower label for Transmission Lines

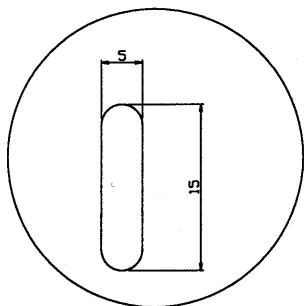


## ANNEXE 2

### Tower label for Transmission Lines



#### Slot Details



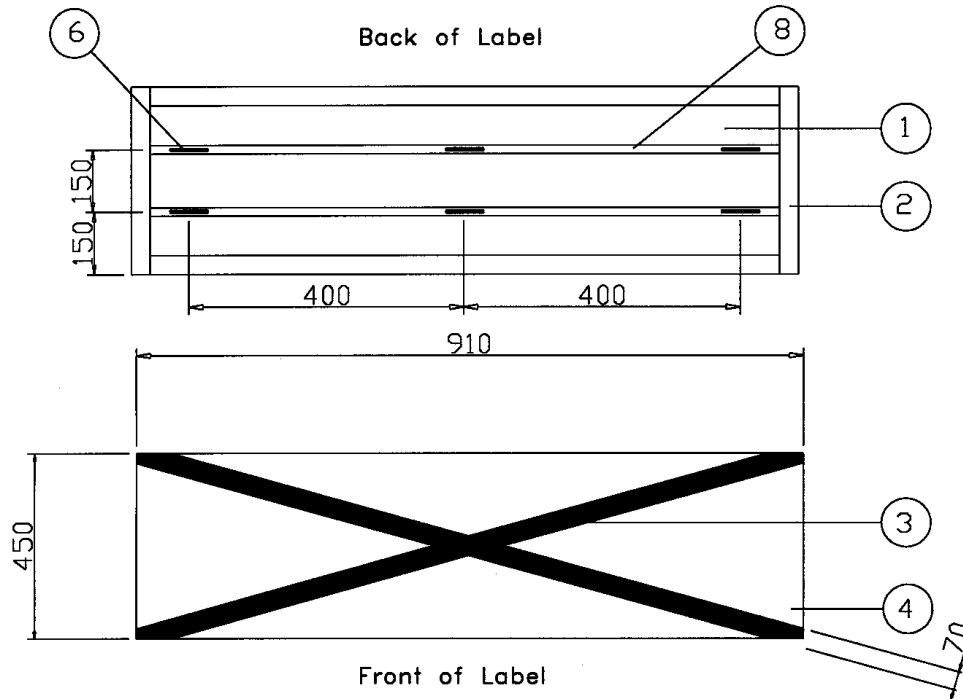
NOTE:  
All dimensions in mm.

#### Material Description

1. Iscor Chromadek 0,6mm yellow 75% gloss or alternatively vitreous enamel. Other material subject to approval by Eskom.
2. Mounting slots (See slot details).
3. 75mm high 3M Scotchcal 7725-12 lettering (line name designation), or 75mm vitreous enamel painted letters in the case of vitreous enable labels.
4. 140mm high 3M Scotchcal 7725-12 lettering (tower designation number), or 140mm vitreous enamel painted letters in the case of vitreous enable labels.
5. Background colour = (Golden Yellow SABS: B49) according to SABS 1091.

## ANNEXE 3

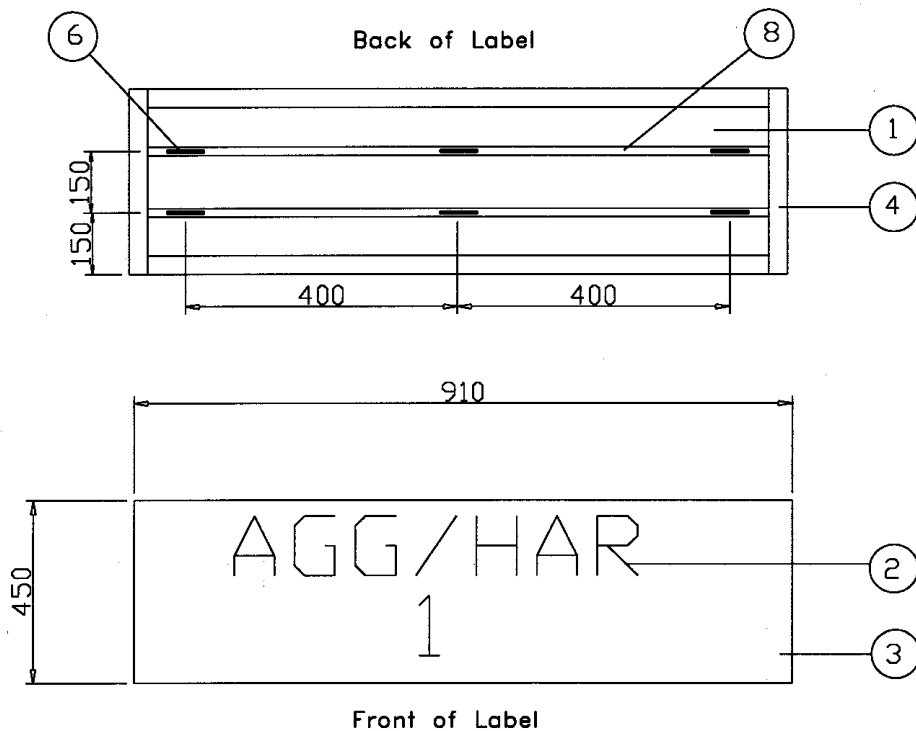
### Line Crossing label for Transmission Lines



NOTE:  
All dimensions in mm.

## ANNEXE 4

### Line Designation label for Transmission Lines



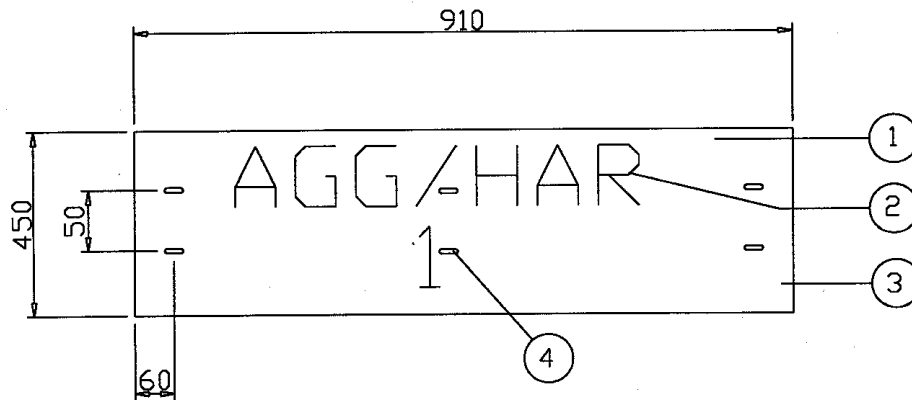
### Material Description

1. Iscor Chromadek 0,6mm yellow 75% gloss.  
Other material subject to Eskom approval.
2. 150mm high 3M Scotchcal 7725-12 lettering.
3. Background colour = (Golden Yellow SABS: B49) according to SABS 1091.
4. Hot dip galvanised square tubing 20mm x 20mm x 1.6mm frame
5. Metal sheeting to be pop riveted onto steel frame by using twelve 4.8mm pop rivets evenly spaced.
6. 20 x 4mm chain links (6 off), welded to frame, for attachment points.
7. All machining, including drilling, welding cutting and grinding must be done before galvanising.
8. 10mm diameter steel bar.

NOTE:  
All dimensions in mm.

## ANNEXE 4A

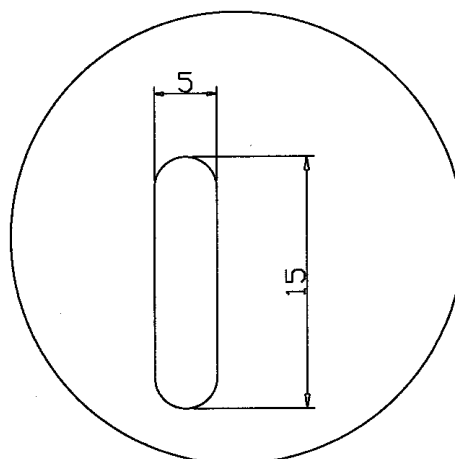
### Line Designation label for Transmission Lines



#### Material Description

1. Vitreous enamel substrate. Other material subject to approval by Eskom.
2. 150mm vitreous enamel painted letters
3. Background colour = (Golden Yellow SABS: B49) according to SABS 1091.
4. Mounting slots (See slot details).

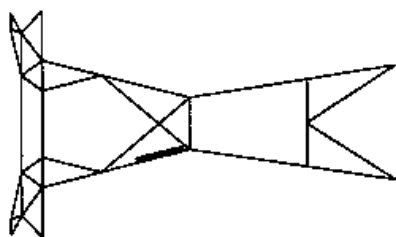
#### Slot Details



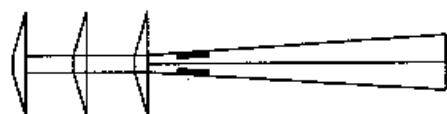
NOTE:  
All dimensions in mm.

ANNEXE 5

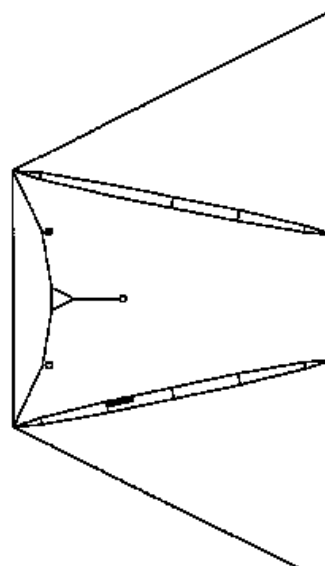
POSITION OF LABELS ON TOWERS



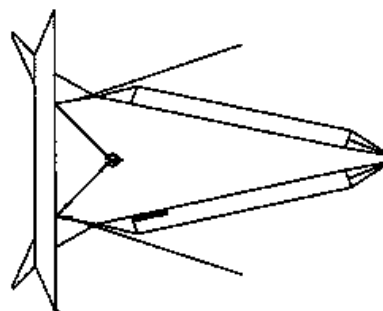
Self Supporting Tower



Double Circuit Tower



Crossrope Tower



Guyed V tower