	Scope of Work	Technology
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 Scope of Work

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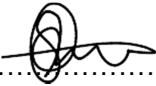
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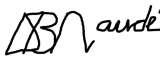
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1. INTRODUCTION

Ingagane is a 275/88 kV Transmission Substation located in the Eastern Region. Geographically the substation is located in Kilbarchan close to Newcastle (S27.846744, E29.9848648). Table 1 indicates the drawings that are relevant to this phase of the project.

Ingagane is a 275/88 kV Transmission Substation located in the Eastern Region. Geographically the substation is located in Kilbarchan close to Newcastle (S27.846744, E29.9848648). Table 1 indicates the drawings that are relevant to this phase of the project.

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2. SCOPE OF WORK

Note that this document must be used in conjunction with the design report (EIng13P01-SE-D87), design drawings (see item 2.1) as well as all specifications, procedures, guidelines and standards mentioned therein. Work will be performed in a live substation, and therefore all necessary safety procedures and precautions must be adhered to.

The civil engineering scope of work for this project includes the following:

2.1 CABLE TRENCHES

- It is recommended that new cable trenches and ramps are constructed in the 88 & 275 kV yards. The option of raising the cable trenches was investigated; however it was not preferred by the Grid. Additionally, by building new trenches, the decommissioned cables can be easily removed. The new trench requirements will have to be integrated into the existing trenches to accommodate the bays.
- Furthermore, all the trench covers in the 88 & 275 kV yards need to be replaced as the existing trench covers are non-standard and do not cover the trenches adequately.

2.2 FENCES

- **Safety Fence**
 - Replace all the safety fences. Some posts are still in good order. An assessment needs to be conducted by the specialist to determine the number of posts that need replacing.

2.3 ROADS

- The existing access road is deteriorated and needs to be resurfaced.

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2.4 DRAINAGE

- Both the HV yards do not have a proper drainage system and the surface run-off water is currently being collected in an open concrete gutter. Ponding of water is visible at various places and the cable trenches prevent the flow of water to the concrete gutter. In order to rectify this, the following corrective actions need to be taken:
 - Install a sub-surface storm water drainage system with sub soils, manholes and storm water pipes to outlets.
 - Install new drainage next to the access road to prevent water to seepage into the HV yard.
 - Refurbish the existing concrete drainage gutters.

2.5 YARDSTONE

- The existing yard stone thickness is less than standard of 100 mm and has been silted with sand and debris due to the poor drainage. The following needs to be done:
 - Remove all the yard stone and stockpile. Clean with water to replace.
 - Level the low areas and compact.
 - Replace existing yard stone to achieve a uniform 100mm thickness
 -

2.6 BUILDINGS

- **Existing Compressor building**
 - See drawing EING13P01-SE-E53

2.6.1 DEMOLISH

- Demolish all exposed concrete plinth's to 80mm below floor level, fill with concrete and make good.
- Secure and remove all cables from the trenches with the assistance of Eskom. Remove and break out all trench covers and steel protective corners. Mechanically clean trenches.
- Fill trenches with cement stabilised selected G5 material.
- Break out ventilation blocks on side of building and make good to receive windows
- Break out deviding wall complete and make good floor and walls.
- Strip and remove all equipment, cables, conduits, air pipes and light fittings
- Exhaust pipes on outside to remain

2.6.2 EXISTING STEEL ROOF SUPPORT

Sand and clean steel I beams and paint

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2.6.3 CEILING

Remove all peeling paint from steel QC decking, sand, clean and prepare for painting.

Paint after the roof is refurbished

2.6.4 WALLS

All internal walls to be prepared for painting and painted as specified.

All exterior facebrick walls to be mechanically or steam cleaned

All plastered exterior walls above window level to be prepared for painting and painted as specified

2.6.5 FLOOR

Mechanically remove floor paint to sound concrete

Apply epoxy resin as specified only after all painting is done

2.6.6 DOOR

Remove the existing door and install a purpose made double leaf steel door as specified on drawing EING13P01-SE-E53 sht. 3

2.6.7 WINDOWS

Remove all windows and make good.

Install new windows as specified

Install new interior window sills

Exterior window sills to remain.

2.6.8 STEEL CRAWL BEAM

Install a steel crawl beam assembly consisting of reinforced concrete foundations, steel columns and beam as specified and detailed on drg. EING13P01-SE-E53 sht's 2 & 4

2.6.9 WORKBENCH

Manufacture and install where shown on plan and as specified

2.6.10 GENERAL EXTERIOR

Vent grilles - Prepare for painting and paint as specified

Door – Prepare for painting and paint as specified

Ramps - Prepare for painting and paint

Fascia, soffit and downpipes to be upgraded and refurbished according to drawing EING13P01-SE-E60

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- **EXISTING LARGE STORE BUILDING**

- EING13P01-SE-E54

2.6.11 CEILING

Existing ceiling to be replaced. It is suspected to be asbestos. It must be taken to a registered dump for asbestos by specialist.

Install a new rhinoboard ceiling as specified

2.6.12 WALLS

All internal walls to be prepared for painting and painted as specified.

All exterior facebrick walls to be mechanically or steam cleaned

All plastered exterior walls above window level to be prepared for painting and painted as specified

2.6.13 FLOOR

Mechanically remove floor paint to sound concrete

Apply epoxy resin as specified only after all painting is done

2.6.14 WINDOW

Replace window putty

Prepare steel frames for painting and paint as specified

Window sill to remain and painted as specified.

2.6.15 ROOF

Fascia, soffit and downpipes to be upgraded and refurbished according to drawing EING13P01-SE-E60

- **SMALL STORE BUILDING**

- EING13P01-SE-E55

2.6.16 GENERAL

Strip and remove all equipment, cables, conduits, airpipes and light fittings

Exhaust pipes on the outside to remain.

2.6.17 EXISTING STEEL ROOF SUPPORT

Sand and clean steel I beams and paint

2.6.18 CEILING

Remove all peeling paint from steel QC decking, sand, clean and prepare for painting.

Paint after the roof is refurbished

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2.6.19 WALLS

All internal walls to be prepared for painting and painted as specified.

All exterior facebrick walls to be mechanically or steam cleaned

All plastered exterior walls above window level to be prepared for painting and painted as specified

2.6.20 FLOOR

Mechanically remove floor paint to sound concrete

Apply epoxy resin as specified only after all painting is done

2.6.21 WINDOWS

Replace window putty

Prepare steel frames for painting and paint as specified

Window sill to remain and painted as specified.

2.6.22 GENERAL EXTERIOR

Vent grilles - Prepare for painting and paint as specified

Door – Prepare for painting and paint as specified

Ramps - Prepare for painting and paint

Fascia, soffit and downpipes to be upgraded and refurbished according to drawing EING13P01-SE-E60

- **ABLUTION AND OFFICE BUILDING**

- EING13P01-SE-E56

2.6.23 CEILING

Existing ceiling to be replaced. It is suspected to be asbestos. It must be taken to a registered dump for asbestos by specialist.

Install a new rhinoboard ceiling as specified

2.6.24 WALLS

All internal walls to be prepared for painting and painted as specified.

All exterior facebrick walls to be mechanically or steam cleaned

All plastered exterior walls above window level to be prepared for painting and painted as specified

Interior ablutions – Remove all wall tiles and tile with new to ceiling as specified

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2.6.25 FLOORS

Office kitchen – Clean tiles

Exist. Ablution – Clean tiles

Replace shower tiles

New ablution – New floor and shower tiles as specified

2.6.26 WINDOWS

Replace window putty

Prepare steel frames for painting and paint as specified

Window sill to remain and painted as specified.

2.6.27 DOOR

Existing – prepare for painting and paint. Replace ironmongery

New – Install door D3 as specified

Install door dust and bottom seals, door closures and door stops as shown

2.6.28 ROOF

Fascia, soffit and downpipes to be upgraded and refurbished according to drawing EING13P01-SE-E60

2.6.29 SANITARY WARE

Install new toilets, basins, sink unit and showers with fittings as specified on drawing

EING13P01-SE-E60

- **CONTROL BUILDING**

- EING13P01-SE-E59

2.6.30 EXTERIOR

Walls - Prepare walls and apply a new coat of Cement wash as specified.

Fascia - prepare for painting and paint as specified

Concrete apron – mechanically clean, seal all cracks with repair mortar and seal joints as specified.

Roof – Check and replace all broken roof and ridge tiles.

Repair loose or cracked ridge tile mortar fill.

Ramp at porch - remove 5mm top

Prepare surface and apply Flowcrete Flowcoat polyurethane sealer.

Battery room door – Remove existing door and replace with new door and ironmongery as specified

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2.6.31 FLOOR

Clean vinyl tiles

2.6.32 KITCHEN

Remove floor units

Remove 3 rows of wall tiles

Install new cupboard floor unit with sink unit

Fit sanitaryware and plumbing

2.6.33 WALLS AND CEILING

All internal walls and ceilings to be prepared for painting and painted as specified.

2.6.34 SHOWER

Fit new sliding shower door as specified.

- **EXISTING BUILDINGS ROOF REFURBISHMENT**

Remove existing malthoid membrane

Repair concrete areas with repair mortar as specified

Apply new waterproof system as specified on drawing EING13P01-SE-E60

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2.7 LIGHTING

- **FLOODLIGHTING**

- Drawings: EING13P01-SE-D47 sht. 1-4
- Supply and install 6 new floodlighting masts at positions indicated on the drawing, OLM01, OLM02, OLM02A, OLM03, OLM04, and OLM04A
- Supply and install cables from LJB1 to OLM04 and OLM04A
- Supply and install cables from LJB5 to OLM02 and OLM02A
- Existing cables shall be used to supply OLM01 and OLM03
- Remove and install 12 existing luminaires and install on masts OLM01-OLM04.
- Supply and install 16 x 60W LED luminaires including spigot adaptor bracket to fit on top of wall.
- Supply and install a 24 way surface mounted 3CR12 stainless steel TFLDB, existing supply to be used.
- Supply and install equipment within DB according to the drawing.
- Supply and install supply cables from TFLDB to luminaires.

- **CONTROL BUILDING**

- EING13P01-SE-D51 sht. 1-3
- Remove 9 x existing luminaires, convert to emergency mode for use with 220V DC inverter and reinstall.
- Remove existing office air conditioner.
- Supply and install new 3,6KW cassette split type air conditioner in office.
- Supply and install 3 x triple pole 63A MCB's in DB1 for supply to the Access control building and the SLDB's.
- Emergency lighting circuits to be verified by electrician and all connection to the luminaires to be checked and ensure that the emergency lighting is functioning.

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- **WORKSHOP**

- EING13P01-SE-D51 sht. 4
- Remove all existing electrical equipment.
- Supply and install new lighting, power points, welding plug and Distribution board.
- Supply and install equipment in the Distribution board.
- Supply and install wiring from DB to lighting, power points, welding plug

- **ABLUTION AND OFFICE BUILDING**

- EING13P01-SE-D51 sht. 5
- Remove all existing lighting, power points and isolator.
- Supply and install new luminaires, light switches and isolator for water heater.
- Supply and install equipment within existing DB5.
- Supply and install wiring from DB5 to lighting, power points and isolator.

2.8 WASTE MATERIAL

- Construction rubble must be disposed of, as per Eskom's environmental and waste disposal procedures.
- Scrap steel and other material that will not be re-used will remain the property of Eskom, unless otherwise authorized, and is to be scrapped in accordance with Eskom's asset disposal procedures
- Contractor to ensure that excavated contaminated material is disposed of at a registered landfill site.

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3. DESIGN DRAWING LIST

- **DRAINAGE LAYOUT** EING13P01-SE-D43
- **SAFETY FENCE LAYOUT** EING13P01-SE-D45
- **FLOODLIGHTING CABLE ROUTE AND MAST LOCATION LAYOUT** EING13P01-SE-D47 sht 1-3
- **CONTROL BUILDING ELECTRICAL INSTALLATION** EING13P01-SE-D51
- **COMPRESSION BUILDING ALTERATION TO NEW WORKSHOP PLAN** EING13P01-SE-D53
- **SMALL STORES BUILDING REFURBISHMENT** EING13P01-SE-D55
- **ABLUTION AND OFFICE REFURBISHMENT** EING13P01-SE-D56
- **CONTROL ROOM GENERAL REFURBISHMENT** EING13P01-SE-D59
- **WORKSHOP, STORES AND OFFICE ROOF REFURBISHMENT** EING13P01-SE-D60

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