1. **Scope of work**

Eskom wants to contract with a certified IT LAN cabling and services installer. The contract will be an enabling contract (on an as and when required contract) below is the scope of work. A list of LAN cables and services has been attached as Annexure L These are indicative standards and may need to be updated in line with new technology as it becomes available and required.

1. **STANDARDS**

The structured cabling shall conform to the current edition of the following standards:

* ISO/IEC 11801 2002/Amd 2:2010 -Generic cabling for customers premises.

All the components of the structured cabling shall comply with this standard. Should there be any discrepancies; the contractor shall make them known in writing to Eskom.

Should the contractor have access to any new best practices in cabling, these shall be made known to Eskom, and if appropriate shall be added as new specifications to be implemented.

# 3. Installation specifications

# 3.1. Specific copper cabling requirements

* All cabling shall be installed so as not to exceed the maximum bend radius.
* All cabling shall be from the same manufacturer and the same category type.
* All cabling shall be installed separately from electrical wiring by using a steel screen divider throughout the length of the shared trunking.
* All cabling spans shall be continuous.
* All cabling shall be individually identifiable through proper naming convention and labelling on both sides of the termination. Labelling will be specified by Eskom.
* Floor outlets shall be within 3m of user’s desk.
* Contractor is responsible for the reinstatement of original ceiling tiles, fittings etc., once cabling is complete.
* All cabling runs shall be kept away from sources of EI (Electro-magnetic Interference).

# 3.2. FLOOR AREA INSTALLATION (HORIZONTAL)

* The cabling between the floor installer and floor outlet shall be Category 6 UTP (Unshielded Twisted Pair). All four pairs of the cable shall be terminated ensuring a 100 ohm termination. The diameter of the cable’s copper conductors shall be 0.5 mm solid copper.
* All the cabling shall support Class E performance to ensure proper support of any application at 1 G b/s. All wiring terminations shall conform to TIA (Telecommunications Industry Association) 568 Schedule B.
* Floor cabling in this area shall meet the IEC 60332-1 minimum fibre requirements.
* Any cable that is run in a plenum shall be made of material that emits low smoke and no halogenate gases.

# 3.3.1 Specific fibre cabling requirements

* + All fibre spans shall be continuous.
  + Fibre cabling shall meet the IEC 60332-1 minimum fibre requirements.
  + Any fibre cable that is run in a plenum shall be made of material that is fire resistant and that emits low smoke and no halogenate gases.
  + All splicing of fibre shall be undertaken using a core alignment splices (V groove alignment is not acceptable). The maximum permissible through joint loss shall be 0.30dB.
  + All fibres shall connect into the patch panel and their cable strength members shall be securely fastened to the termination points.
  + All fibres shall be terminated using ST/LC type connectors. Approved (Small Form Factor) SFF connector cords shall be supplied to connect to active equipment.
  + Should fibre be used in horizontal installations then it should be OM3/OM4 50/125 micron fibre.
  + Blown fibre as per industry standards (if requested)
  + 8-fiber harness: MTP/MPO (pinless) – 4 LC Uniboot (40G to 10 G breakout cables)

# 3.3.2 FIBRE BACKBONE INSTALLATION (VErCTICAL)

* + The backbone shall comprise fibre optic cable to conform to active equipment requirements. These are specified as:
  + 24 pair single mode fibre
  + LC connectors for connection to active equipment
  + FC/PC connectors for panel

# 3.3.3 CABLE TRUNKING AND ROUTING

* + Cabling routes and trunking shall be according to agreed design that shall be implemented by the contractor and verified by Eskom.
  + All trunking shall meet current cabling needs and shall accommodate 15-20 % expansion for future use.
  + All cabling shall be strapped and run in trunking.
  + Consolidation points shall be housed in a suitable enclosure and securely mounted to the underside of slab or fixed to the cable basket in ceiling voids.
  + A maximum of 12 cables may be bundled together in a loom. Each cable loom shall be separate and tie spacing shall not exceed 600mm.

# Work area and patch cords

All UTP floor area patch cords shall be prefabricated, and shall conform to the standard.

# Testing

All copper cable testing shall be done on the channel link and the testing shall conform to Class 6 performance specifications.

The tester shall be suitable for level 3 testing and this requirement will be verified by means of the tester’s latest calibration certificate. Calibration date and details of tester shall be supplied to Eskom before testing commences.

Testing of channel links shall comprise full level 3 tests performed from both ends. The following tests are required:

* Wire map
* Length
* Attenuation
* NEXT – Near End Crosstalk
* PSNEXT – Power Sum Near End Crosstalk
* FEXT – Far End Crosstalk
* ELFEXT – Equal Level Far End Crosstalk
* PSELFEXT – Power Sum Equal Level Far End Crosstalk
* ACR – Attenuation to Crosstalk Ratio
* PSACR – Power Sum Attenuation to Crosstalk Ratio
* Delay skew

OTDR testing of all fibre links shall be undertaken. OTDR plots for all links shall be included in appropriate documentation. Cables shall be properly cladded with connectors that suit the terminating equipment. Test results shall be submitted both as hard copy and in digital format.

# Documentation

The following documents shall be provided by the contractor at final inspection:

* Design of cabling structure
* Inspection check list
* Test results of the installation
* Any warranties
* Schematics showing the cabling structure shall be mounted in transparent holders at each distribution point.

# Certification

* The Cabling vendor must be a certified installer.
* Cable certification will be enforced.
* The vendor performing/conducting the installation must produce a signed certificate in this regard.