

PROJECT DEFINITION

The purpose of the project is to acquire a panel of service providers that will provide installations, maintenance, testing, and reporting services for fiber and UTP/Copper cabling. The panel of service providers will supply qualified Krone/Molex/Comm Scope Certified providers with the capability to provide cabinets, cabling installation, and maintenance services for the University for ICT and business projects of various sizes and complexities as initiated by the University over a period of three (3) years.

1. UNIVERSITY'S/PROJECTS' OBJECTIVES

1.1. The objective of the project is:

- 1.1.1. To enable the Wits ICT network division to source and install cabling services for network equipment, cameras, access panels, laptops/PC, printers, research equipment, security equipment, and intercampus connections, including fiber/ point -to- points.
- 1.1.2. To source qualified and experienced network cabling panel of suppliers for the implementation, maintenance, support, and consultation service(s) to handle complex ICT and business projects.
- 1.1.3. To strengthen the Wits ICT department's capacity to deliver strategic initiatives for the University

2. WITS UNIVERSITY ICT NETWORK INFRASTRUCTURE

2.1. Wits University ICT network infrastructure consists of Data Switching i.e. Core Switches, Distribution Switches, Firewalls, Mini Distribution Switches, Wireless Controllers, Access Switches, and Access Points. These devices interconnect the entire Wits network as follows:

2.1.1. Network background

- 2.1.1.1. The Wits Data Network consists of WAN Links.
- 2.1.1.2. The network topology is a three-tier model, that is, the Core, Distributions, and Access Layer, including mini routers at various sites
- 2.1.1.3. The interconnection between Wits campuses and remote research sites is through Inter-Campus Link Upgrade (ICLU) Fiber optic ring, and the internal buildings connect via the Fiber backbone. ICLU is the primary connection for main campuses, and the TENET Fiber ring is secondary.
- 2.1.1.4. The TENET Fiber ring is the primary link for hospital connectivity for Chris Hani-Baragwanath, Helen Joseph, Zola clinic, and Rahima Moosa, and point-to-point secondary link for Helen Joseph and Rahima Moosa. Tara Hospital is on the ADSL link. There are two point-to-point links from Solomon Mahlangu House (SMH) to Medical School. One point-to-point from CLM to Business School and one point-to-point from Medical School to Business School. Another two point-to-point links from Essellen building to Forensics and National Health Laboratory Services (NHLS), which is also a third level of redundancy between campuses.

- 2.1.1.5. There are two main data centres and areas distributions. The primary data center is at the East Campus, and the backup data center is at the West Campus. The data center cabling consists of the following link speeds: 100Gbps, 40Gbps, and 10Gbps fiber cables.
- 2.1.1.6. There are approximately 90 000 Cat6+ Copper cables across all Wits campuses, including data center and LAN connections.

Below is a diagram that displays the Wits intercampus fiber ring highlighted in green.



Figure 1: Wits intercampus fiber ring in green

3. OVERVIEW OF THE SCOPE OF WORK

The scope of work pertains to the site surveys, acquisition of infrastructure, setup and installation, testing, integration with existing network cabling, proper functioning of all the constituent network connectivity with the University's infrastructure, and the proper day-to-day operation of the entire solution. The service provider can partner with or subcontract for specialized requirements where needed. overview of the scope of work.

1. Task	Descriptions
The Service provider should assist with site assessments, implementation, support, and maintaining the network cabling.	• Site surveys
	• Project scoping supply
	• Installation
	• Integration
	• the day-to-day operation of the entire solution
Scoping	• Scoping will be carried out for all additional/extensions/network installations to determine the installation plan for the following and related requirements such as cabling, UPS, cabinet, and wired & wireless layout.
The requirements of the goods and services to be delivered by the successful panel of service providers must, at a minimum, contain the following:	• Must supply all cabling requirements, including cabling, cabinets, minimum of 1 gigabit power injectors (PoE), and fiber converters.
	• The original equipment manufacturer ("OEM") must cover all vendor-supplied equipment with a minimum of a 12 months warranty for the receipt of passed test results
The successful panel of service providers will include all equipment, including but not limited to the following:	• Cabling (Ethernet and Fiber); testing, repair, and report of existing and new.
	• Cabinets with Three-way door access and perforated front door
	• Future projects requirements and implementations when a need arise during the contract.
	• Upgrade of Cables when required
	• Maintenance and support of cabling when required
The wireless mounting and cabling, at a minimum, will include but not limited to	• The service providers (s) conduct thorough site visits to identify current and outside cabling routes, including aerial and underground cabling routes. If there are no cabling routes, create new routes as and when required. The service providers must ensure that all routes are accessible and visibly marked as per University standards.
	• The service provider must visibly mark inside building cabling pathways as University standards
	• The panel of services providers must assess all available and suitable network points that can be utilized for wireless access point connection instead of installing new network points.
	• The service provider will check the availability of access switch ports in all buildings currently on the University's network before any installations.
	• Approval must be granted for buildings that are not currently populated with Wits network infrastructure

	<ul style="list-style-type: none"> Site surveys must be conducted, presented (including findings and recommendations) and approved before installing any required network infrastructure and equipment, i.e. cabinets, cabling, mounting access switches, and mounting access points.
	<ul style="list-style-type: none"> The University will provide power sockets in all areas where the University's network equipment will be installed.
Cabling (Ethernet and Fiber) specifications:	<ul style="list-style-type: none"> The user terminating network points must be CAT6 and above standard and include associated accessories. The cabling must comply with reputable cabling industry standards, such as Krone and Molex standards. The Fiber optic cables must provide a minimum speed of 10Gbps from the mini distribution router to access switches Fiber and UTP cabling must be certified by the service provider after installation, and a drawing of all correctly marked cables must be added to the sign-off document, which will include the following requirements: <ul style="list-style-type: none"> Test results – from a Fluke/Net tester, for UTP cable testing and OTDR tester, for fiber testing TIA standard installation and test results; showing distance, speed, error, and interferences Electro-Magnetic Interference (EMI) for UTP cables and DB losses for Fiber cables Any minor civil works to install (and accommodate) cablings, such as trenching, lockable utility holes, routing, and sleeves.
The service provider must obtain the necessary permissions and authorizations from the following:	<ul style="list-style-type: none"> University facilities (PIMD) for installations and minor civil works within the university properties Heritage committee for heritage buildings installations other facilities management team for hospital, research buildings and other The relevant municipality and other authorities including wayleaves and licenses. Other relevant Wits faculties e.g., Sports facilities, Chamber of Mines, art theatre, mortuary, forensic and chemical labs/storage
University ICT equipment delivery process:	<ul style="list-style-type: none"> The vendor needs to communicate Three (3) days in advance by providing an inventory of the goods to be delivered on an Excel spreadsheet that includes the following details: delivery date, Purchase order, item description, serial number, quantity, warranty, unit cost, and total cost. All goods will be delivered to East Campus, Solomon Mahlangu House, 1st Floor, Room SH1015.
Equipment pick up for installation process	<ul style="list-style-type: none"> The panel of service providers must complete the paperwork for equipment to be released, which includes item description, serial number, quantity, installation area, estimated date of installation, and an estimated date for installation sign-off.

	<ul style="list-style-type: none"> Wits will communicate to the service providers once the equipment is ready to be picked up
	<ul style="list-style-type: none"> The service provider's project team leader will sign for the release upon pick up.
Wits ICT and the service provider's team leader will complete the installation sign-off (Per site or per installation).	<ul style="list-style-type: none"> Cabling maps with full locations
	<ul style="list-style-type: none"> Network point labelling refer to Annexure xx, point 5
	<ul style="list-style-type: none"> Passed test result
	<ul style="list-style-type: none"> OEM product certificate
	<ul style="list-style-type: none"> Updated documentation reflecting all changes to the existing infrastructure

4. TIMEFRAMES AND DELIVERABLES

4.1. Per project scope, the service provider must provide estimated dates per installation, and overlap of installation activities is allowed.

4.2. **Project Plan:**

Documentation relating to all installation done on Network Infrastructure and Cabling

Project Plan 1: Pilot	<ul style="list-style-type: none"> i. Sign-off the contract and service level agreement (SLA) ii. Site visit and introduction iii. Technical scoping and initial planning iv. Ordering equipment
Project Plan 2: Transition and asset verification period	<ul style="list-style-type: none"> i. Delivery of equipment ii. Requests for building access iii. All equipment will be asset tagged and registered with the University iv. Delivery of equipment to site

Project Plan 3: Implementation phase	<ul style="list-style-type: none"> i. Installation of equipment ii. Configuration of equipment iii. Testing of equipment functionality iv. Tidying Up
Project Plan 4: Sign-Off	<ul style="list-style-type: none"> i. Documentation ii. Quality assurance and fixing snags iii. Final site visits iv. Full end-to-end testing v. Handover to operations

5. TEST FOR REPAIR AND REPLACE

5.1. The successful service providers must provide test for repairs and fixes for existing equipment's, and these include but are not limited to:

5.1.1. Datacentre and inter-university Fibre cables

5.1.2. Test and repair of existing network connections

6. SERVICE LEVELS

6.1. **Projects Delivery of services must include but is not limited to the following:**

6.1.1. Request for Quotation (RFQ) or Request for Proposal (RFP) within 24 hours after the scoping session; Services and Equipment/Goods (including the pricing/costs) must be valid for a minimum of 30 (thirty) days. The Equipment/Goods must be ordered within 24 hours after Purchase Order (PO) is issued, and Project implementation must commence 24 hours after the Equipment/Goods have been delivered to the University.

6.2. **Diagnose and resolve cabling outages.**

6.2.1. Root Cause analysis – determine the cause of a failure or outage and provide resolution.

6.2.2. The support for all cable related for wired, wireless, and security equipment should include but not be limited to the following:

6.2.2.1. **Service Level Penalties**

6.2.2.1.1. A penalty of 1% of the Project payment Milestone will apply per day if a Milestone is delayed by 10 (ten) Business Days. To avoid doubt, if a Deliverable was due on *the date*, the penalty will be applied from the *specified date*, per day and event. All post-installation support and maintenance will be subject to penalties. The service level penalties/credits will be negotiated during the conclusion of a Project SOW. However, if the Parties are not able to agree on the appropriate service level penalties/credits, a penalty/service credit of 0.01% of the total contract price per day under that Project SOW will be enforced by the University.

7. CONTRACTUAL MANAGEMENT

Project Allocation

- 7.1. All projects will have different scopes, bills of quantity, and timelines; The Cable Panel of Service providers will receive information related to the project as follows.
- 7.2. All service providers will receive an invitation for scoping through an email from Wits representation for projects.
- 7.3. For every request the initial scope of work will be provided with an estimated bill of quantity, and the final bill of quantity will be concluded after the final site survey scoping.
- 7.4. The project allocation model will be as follows:
 - 7.4.1. The University at its discretion will appoint a service provider fairly for each project, based on the scope of work, the bill of quantity, timelines, and strategy.
 - 7.4.2. Cost-effective project implementation is a priority; however, the University will consider the following over and above the cost-effective model:
 - 7.4.2.1. Solutions proposal that includes the future technology that is fit for purpose for the University, the skills, and capabilities of the supplier for the project, and the capacity to deliver the project as per the timelines.
 - 7.4.2.2. A fair opportunity for all service providers will be excised; the number and cost of projects per supplier will be reviewed
 - 7.4.2.3. Timelines and delivery of each project are critical; the proposal that will allow a project to be completed in a reasonable short time while considering the challenges and providing a proactive risk mitigation plan
 - 7.4.2.4. Previous project experiences will be strongly considered; service providers are encouraged to deliver each project professionally, up to the University (Annexure: E: Wits ICT Standards Document) and OEM standards, and with minimal disruption to teaching and learning.

8. SIGN-OFF

The service provider agrees that all payments will be as per project deliverables and milestone's percentages. Payment will be as per the agreed SLA deliverables. Payment will be withheld if service or installation has not been delivered according to agreed scope.

9. VENDOR MANAGEMENT MEETINGS

- 9.1. The University's project manager will chair monthly meetings, and regular performance reviews will be based on compliance with the University's ICT standards and agreed project SOW. The service provider must set up weekly progress and service delivery meetings and keep minutes of each seating.
- 9.2. **Incident reports must include but are not limited to the following:**
- 9.2.1. Description of the incident,
 - 9.2.2. start time and end time,
 - 9.2.3. Cause,
 - 9.2.4. resolution,
 - 9.2.5. recommendation,
 - 9.2.6. and additional information.
- 9.3. **A consultation report will include:**
- 9.3.1. information as per the agreed scope,
 - 9.3.2. recommendation, and
 - 9.3.3. additional information.
- 9.4. Project progress meetings for each project weekly with the project team and project site visits will be included when needed.
- 9.5. Depending on the size of the projects, there will be steering committee monthly meetings and the committee will be selected by the CIO.
- 9.6. Project review sessions will be conducted every second month to review all projects allocations and overview for service improvements required.
- 9.7. Annual performance review of service providers will be conducted, and feedback will be shared with the contract manager, ICT technology service, and other departments if required.
- 9.8. **Annual assessment of cabling service providers**

- 9.8.1. Overall assessment report and feedback will be provided annually. The review will be conducted throughout the year and the report will include but not limited to the following:
 - 9.8.1.1. Delivery of each project professionally, according to the University standard and with minimal disruption to teaching and learning
 - 9.8.1.2. Project delivery within the agreed timelines,
 - 9.8.1.3. Noted challenges and provide a proactive risk mitigation plan.
 - 9.8.1.4. Successful project sign-off as defined in the scope of work.
 - 9.8.1.5. Minimal unexpected issues after completion of the project; this will include but are not limited to:
 - 9.8.1.5.1. Damage to property paving, tar roads, tiled floors, walls etc
 - 9.8.1.5.2. Dirty ceilings and floors
 - 9.8.1.5.3. Rubble removal if it applies.
 - 9.8.1.5.4. Equipment and cabling not installed correctly as per standard documents.
 - 9.8.1.5.5. cabinet neatness as per standard documents
 - 9.8.1.5.6. cable management as per standard documents

10. ACCEPTANCE CRITERIA

- 10.1. All solution elements must be proven to function correctly with each other, and the existing University systems and infrastructure and must comply with the acceptance criteria. The tests, together with their associated remedies and acceptance criteria, will be used to gauge function correctly according to the following procedure and as per Annexure E.
 - 10.1.1. Cabling must be tested, ensure all comply with the University's standards and acceptable results are handed to the University representative.
 - 10.1.2. Cabinets should be installed at the identified locations and must comply with building regulations.

11. RISKS, ASSUMPTIONS, DEPENDENCIES & EXCLUSIONS (RADE)

The following risks, assumptions, dependencies, and exclusions will have the following effect:

Risk (R) / Assumption (A) / Dependency (D) / Exclusion (E)	Effect on the Project
Power failures	Equipment and tools needing the power to operate might delay the project
Properties not owned by the University	The Department of Health owns hospitals and Clinics, and there could be delays while waiting for installation permission and access
Sensitive areas, including and not limited to Mortuaries, X-Rays, Theatres, and ICUs	The hospital rules and regulations might limit access or prohibit installations to these areas
Heritage Buildings	The heritage buildings rules and regulations might limit access or prohibit installations to these areas
Storage	All equipment will be delivered at SMH for asset tagging, there could be delays as it will not be delivered directly to the site. The service provider will collect the equipment from SMH to installation site and it is their responsibility to insure the consignment to the destination. Wits carry the liability once the equipment is delivered at SMH and after installation sign off.

12. STANDARDS AND SPECIFICATIONS

12.1. Annexure E Wits ICT standard document details the University's ICT installation standards regarding network-related infrastructure installation, configuration, and testing. The document follows the following but is not limited to these standards:

- 12.1.1. Prince2
- 12.1.2. PMBOK
- 12.1.3. COBIT (<http://www.isaca.org/Knowledge-Center/COBIT/Pages/Overview.aspx>)
- 12.1.4. OHS (<http://occupationalhealthandsafetyact.co.za/>)
- 12.1.5. DHET Norms and Standards
- 12.1.6. SANS (<https://kwick.co.za/images/resources/downloads/SANS10085-1-Scaffolding-design-and-erection.pdf>)
- 12.1.7. ISO 9001 (<https://www.iso.org/iso-9001-quality-management.html>)
- 12.1.8. ISACA (<https://www.isaca.org/pages/default.aspx>)
- 12.1.9. ITIL (<https://www.axelos.com/best-practice-solutions/itil>)
- 12.1.10. AVIXA (<https://www.avixa.org/standards>)
- 12.1.11. ICASA standards (Electronic Communication — Independent Communications Authority of South Africa ([icasa.org.za](https://www.icasa.org.za)))
- 12.1.12. ANSI/TIA/EIA-559-B: Commercial Building Standards for Telecommunication Pathways and spaces
- 12.1.13. ANSI J-STD-607-A: Commercial Building grounding (earthing) and bonding requirements for telecommunications, 2002
- 12.1.14. ANSI/TIA/EIA-758: Customer-owned outside plant telecommunications ICTI standard, 1999
- 12.1.15. Cisco's Quality Management System is certified by International Standard Organization (ISO 9001:2015. (https://www.cisco.com/c/dam/en_us/about/ac50/ac208/ac243/ac244/docs/iso-9001-web-certificate.pdf))

- 12.1.16. Institute of Electrical and Electronics Engineers (IEEE 802.11 is a wireless standard with the following variations IEEE 802.11, IEEE 802.11r, IEEE 802.11g, IEEE 802.11a, IEEE 802.11b, IEEE 802.11ax, IEEE 802.11ac, IEEE 802.11e and IEEE 802.11g (<https://www.ieee802.org/11/>) Switching equipment IEEE 802.1as, IEEE 802.1s, IEEE 802.1w, IEEE 802.1x, IEEE 802.1x-Rev, IEEE 802.3ad, IEEE 802.3af, IEEE 802.3at, IEEE 802.3bz, IEEE 802.3x full duplex on 10BASE-T, 100BASE-TX, and 1000BASE-T ports (https://standards.ieee.org/standard/802_3-2018.html)