

PEMASANGAN SISTEM TEKNOLOGI MAKLUMAT & KOMUNIKASI (ICT) UNTUK
UNIVERSITY MALAYSIA TERENGGANU - PACKAGE 2C

1. Summary Scope of Work

- 1.1. Supply, install, test and commission Network Cabling infrastructure (Internal Installation of Structured Cabling System) including ducting, internal fiber optics cables and horizontal cables with the accessories
- 1.2. Supply, install, test and commission Active Network Equipment For Networking System including Distribution Switches, Edge Switches, Wireless Access Point, including equipment racks and accessories
- 1.3. Provide services to enable the new facilities to be integrated to existing ICT infrastructure and equipment
- 1.4. Provide, warranty and support for the commissioned facilities

2. Overview

- 2.1. Universiti Malaysia Terengganu is being expanded to provide additional space and facilities to its existing campus. The work package is identified as Package 2C
- 2.2. It involves the construction of 2 buildings namely Institut Oseanografi & Akuakultur Tropika (4 flrs) and Htaheri (2 flrs).
- 2.3. The main contractor has been selected and the construction is scheduled to be completed on 18-Oct-2010
- 2.4. The main objective of this project is to provide a common structured cabling (horizontal and vertical) and associated networking equipment. Note that all external fiber works and connection to existing ICT infrastructure is not part of this tender.
- 2.5. The selected bidder will be nominated as subcontractor and answerable to the main contractor.

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3. Preliminaries

- 3.1. The Information and Communication Technology Contractor (hereinafter called the "ICT Contractor") shall provide preliminary items as mentioned in the Bill of Quantity.
- 3.2. Preliminary items include Performance Bond in terms of Insurance Guarantee or Bank Guarantee. The validity of the Performance Bond shall be extended to 2 years after acceptance of the system. Note that each package shall have its own Insurance Guarantee or Bank Guarantee shall be
- 3.3. The contractor shall submit detail shop drawing in AutoCAD R15 or higher format for each package. The drawings shall include detail cable and trunking route for the internal cabling route. These drawings shall be submitted to JKR for approval prior to installation. Contractor shall take into consideration the estimated cost required to prepare the drawings. This cost shall be part of the whole project cost.
- 3.4. The ICT contractor shall regularly update JKR with progress reports of this project. The reports shall be in electronic, structured web-based form complete with digital images to be submitted twice a month. The report shall be in CD-ROM to be published in JKR Elektrik website.
- 3.5. The contractor is responsible in providing storage area to store materials and equipments on site. Security of the area is the responsibility of the contractor.
- 3.6. Monitoring of the project work for each package will be based on Critical Path Method (CPM). The tool to be used is Microsoft Project. Detail planning of project implementation shall be submitted with this tender. The contractor shall follow the general format of the project implementation plan provided in this tender. The contractor is allowed to modify and customize the activities to suit the requirement and schedule of each package.
- 3.7. The project implementation plan shall include and consider all required information including scope, time, costs and resources as well as risks of each package.

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4. Internal Back Bone Cabling

- 4.1. Internal backbone refers to internal cabling between buildings. The cable shall be of 8-core multi mode indoor fiber optics.
- 4.2. The cable shall be installed in galvanized metal trunking and must be labeled as ICT at every 3 meter apart. In cases that trunking need to be installed as surfaced-run, the trunking shall be disguised such as by painting it with the same color of the wall or ceiling or by hiding it behind beam
- 4.3. All work that involves hacking, earthwork and making good or any civil work require facilitating the installation is the responsibility of the ICT contractor. The ICT contractor must make sure the site is in good condition after the installation.

5. Vertical Backbone Cabling

- 5.1. Vertical backbone refers to cabling between one switch to another in the same building which can be on different or on the same floor. The cable shall be of 50 micrometer 8-core indoor multimode fiber.
- 5.2. The cable shall be installed in galvanized metal trunking and must be labeled as ICT at every 3 meter apart. In cases that trunking need to be installed as surfaced-run, the trunking shall be disguised such as by painting it with the same color of the wall or ceiling or by hiding it behind beam.
- 5.3. All floor openings for ICT installation shall be covered with fire retardant material.
- 5.4. The ICT contractor shall submit the trunking size and layout for approval prior to installation for each package

6. Horizontal Cabling

- 6.1. Horizontal cabling refers to cabling from the equipment rack to the faceplate of the network port.
- 6.2. The network ports of UTP Cat 6 (EIA/TIA Cat6) type in concealed heavy duty UPVC conduit c/w modular type RJ45 jack, patch panels, faceplates, patch cords and RJ45 connectors. The locations may be refined before the work starts.

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- 6.3. Part of the network port is for WiFi access point. The location will be determined before work starts.
- 6.4. The cable shall be installed in galvanized metal trunking and must be labeled as ICT at every 3m apart. In cases that trunking need to be installed as surfaced-run, the trunking shall be disguised such as by painting it with the same color of the wall or ceiling or by hiding it behind beam.
- 6.5. Conduits shall be of Galvanized Iron conduit type and to be installed concealed. All work of making good of the area due to the installation shall be borne by the ICT contractor.
- 6.6. Above ceiling conduits shall use saddle in order to tie it up closer to the wall.
- 6.7. The height for WiFi ports shall be at 300mm below ceiling level. The installation shall include faceplate and RJ45 connectors. The final location will be determined before the work starts.
- 6.8. All conduits and trunkings must comply with JKR specifications and approved brands. The ICT Contractor must submit the brand names in this tender.
- 6.9. Lists of approved brand of conduits and trunking can be viewed online at <http://ict01.jkr.gov.my/ema1>
- 6.10. Installation of all conduits and trunkings must follow JKR guidelines and specification as in the LS1 and LS3.
- 6.11. All cables (fiber and UTP Cat6) shall be terminated in equipment racks c/w fiber optic termination units, patch panels, ventilation fans, power supply, fiber and UTP Cat6 patch cords, cable management and other necessary accessories.
- 6.12. All equipment racks shall be located in the identified Telecommunication Closets (TC) for each level. They shall be of 27U or 42U floor standing type or 15U wall mounted type.
- 6.13. These racks shall be placed at a suitable location with good ventilation and security.
- 6.14. Shop drawings that show proposed cable route and location of network ports and equipment rack shall be submitted to JKR for approval.

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- 6.15. The work of supplying, laying, termination, testing and commissioning for the cabling shall be done by a Certified Installer. The ICT contractor shall submit the certification upon submitting this tender document.

7. Equipment, Materials, Workmanship and Schedules of Works

- 7.1. All equipments supplied shall be high reliability, robust and meet the enterprise standard. Special precaution and steps shall be taken to reduce the harmonics/electromagnetic coupling effects produced by the equipment to minimum levels such that the operation of the other equipment will not be adversely affected.
- 7.2. The Equipment shall be suitable for the local electricity supply system of 240 V, 3 -phase, 50 Hz and for the equipment susceptible to surges and voltage variations shall be provided with suitable surge protection for incoming/outgoing for power and data line and UPS systems.
- 7.3. All works shall be of good current engineering practices and shall be carried out by approved Contractor and supervised by qualified, competent and skilled ICT consultant. Contractor shall submit the name of Contractor (System Integrator) to END-USER, together with the tender proposal.
- 7.4. All design, installations and equipment offered shall be useful and beneficial to the user. They shall be free from any defects, shortcoming or wastefulness in term of every aspect, which cover installation, operation, maintenance, safety, security, aesthetic etc. as well as related to cost.

8. Certification of Works, Final Inspection, Testing and Commissioning

- 8.1. The ICT contractor shall perform test and commission after installation of the cabling system
- 8.2. Testing will be in two phases. The first will be System Acceptance Test (SAT). The test will be focusing on the system functionality.
- 8.3. Final Acceptance Test (FAT) will follow SAT. After FAT the whole system must be operational and functional based on the users' requirements.
- 8.4. All test results shall be documented in both softcopy and hardcopy form and shall be submitted to JKR.
- 8.5. The ICT contractor shall maintain the Information and Communication Technology System for full functionality during Defect and Liability period.

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- 8.6. After the installation works have been completed, the Contractor shall engage competent personnel to carry out inspections, performance tests and other pre-commissioning tests of the installations and equipment according to the requirements of the relevant authorities and the Contract.
- 8.7. The same competent personnel shall certify that the installations and equipment have been completed and are functional and safe to be used / operated according to the requirements of the Contract. A set of the above testing results and reports shall be submitted to JKR for approval. Before that, a schedule for final inspection, testing and commissioning agreed upon by all the relevant parties shall be submitted to JKR at least two weeks in advance before any final inspection, testing and commissioning is to be commenced.
- 8.8. The Contractor shall also submit four (4) sets commissioning manuals / procedures to the Projector Director at least four (4) weeks before the commencement of testing and commissioning. Brief presentation on the testing and commissioning procedures shall be conducted for the Government personnel before the testing and commissioning.
- 8.9. All testing and commissioning works shall be carried out in the presence of JKR's representatives unless otherwise approved by JKR.
- 8.10. The testing and commissioning works shall include, but not limited for the following phases:-
- a) End-to-end functionality,
 - b) User-to-user,
 - c) user-to-servers connectivity within the Local Area Network.
- 8.11. User acceptance testing (UAT) checklist to be prepared to ensure the solution and configuration are performing as required by END USER. Total acceptance of the system which include the installation, configuration etc prior to hand-over shall subject to the JKR's approval.

9. Warranty

- 9.1. Warranty to be provided shall be full warranty (parts and labor) for all cabling and accessories supplied for a period of 24 calendar months from the date of FAT of the last piece of equipment has been delivered.
- 9.2. The ICT contractor must, in each instance make repeated efforts within a reasonable time to maintain the equipment as warranted.

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- 9.3. The warranty includes proper performance and functioning of the infrastructure in accordance with the specification provided. The equipment shall be free from defects in material, workmanship and design.

10.Operation and Maintenance

- 10.1. The Contractor shall be responsible for maintaining the whole installation.
- 10.2. The Contractor shall prepare detail operation and maintenance programs and to be submitted to JKR before Certificate of Practical Completion being issued. Scheduled and Preventive Maintenance shall be carried out for the overall system during the Maintenance Period.
- 10.3. The Contractor shall repair/replace all defective/ faulty equipment/ works and to carry out all the breakdowns during the Maintenance Period. All materials, replacement parts, equipment, consumable items, labour etc., required for the repair and maintenance of the installations, works, plants, equipment etc., during the Defect and Liability Period shall be provided by the Contractor.
- 10.4. The Contractor shall take immediate action to carry out any rectification work and restore the installation to its normal operating conditions upon receipt of the complaint form the officer in-charge of the END-USER or his representatives. If no action is taken to carry out the repair work within twenty four hours upon lodging of the report, the JKR shall reserve the right to engage a third party to carry out the rectification works with all the costs and expenses charged to the Contractor.
- 10.5. For the purpose of providing the maintenance services during the Maintenance Period, the Contractor shall station a maintenance team in the project site. This maintenance team shall comprise of skilled, qualified and competent personnel to carry out the operations and the maintenance of system.
- 10.6. This team of personnel shall work hand in hand with the members of the END-USER maintenance team such as to effect proper transfer technology from the Contractor to the END-USER personnel.
- 10.7. The Contractor shall ensure that the availability of adequate spares for the system is being provided to the field service support in order to avoid delay in reinstating the network service.

11.Documentation in Softcopy and Hardcopy

- 11.1. Within one month after the award of the Contract, the Contractor shall

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submit four sets of detail schedules of works in CPM format indicating the sequence of design, preparation of drawings, fabrication, construction, execution, installation, testing and commissioning etc. Contractor shall also submit detail design and drawings to JKR (in hardcopy and softcopy) for comment, three sets to be kept in the JKR's office and one set at the site office. The drawings shall be accompanied with detail calculations, technical data and catalogues.

- 11.2. Within one months after the completion and handing over of the project, the Contractor shall submit one set of tracing / original document one set in CD ROM with appropriate software to run and four (4) sets of prints of as-built drawings, technical information, catalogues, operation and maintenance manuals, spare parts lists, servicing schedules, testing and setting results etc. to JKR for comment and retention.
- 11.3. These documents shall be properly bound with hard covers. If JKR is not satisfied with the submissions, the Contractor shall make the necessary alternations and amendments and resubmit the documents within three weeks after the comment is made.
- 11.4. The Contractor shall submit full specifications, technical details and drawings, catalogues, name of manufacturers, model numbers etc. of the equipment and materials together with their tender documents.
- 11.5. Shop drawings for each package that show proposed trunking conduiting route, location of network ports and equipment rack (TC) shall be submitted to JKR in hardcopy (3 sets) and softcopy (ACAD/ MS Visio /Web Format) for approval prior to installation. Shop drawings /as built drawings must use JKR's Standard (Unit Perunding Rekabentuk ICT, CKE IPJKR) symbols to indicate network ports, trunking / Conduiting route and etc.
- 11.6. Within one month after the completion and handing over of the project, the Contractor shall submit one set of As-Built Documents (Hardcopy with hard cover and Softcopy in Structured Web Format) in three (3) sets. These documents shall be properly compiled in CDROM. If JKR is not satisfied with the submissions, the Contractor shall make the necessary alterations and amendments and resubmit the documents within three weeks after the comment is made.
- 11.7. As-Built Documents shall include, but not limited for the following list;
 - a) As-built drawings (trunking/conduiting route, location of network ports, equipment rack etc.
 - b) Manual operation of installed equipments / systems.
 - c) Test result on cabling system, servers, switches and etc clw photos.

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- d) Inventory list of complete system installed
- e) Manual reporting flow during warranty, defect & liability period.

12. Defect and Liability

- 12.1. The Contractor shall guarantee the whole installation free from defect and inadequacy in design, manufacture, fabrication, and installation works during the Defect and Liability Period.
- 12.2. The Contractor shall repair/replace all defective/faulty equipment/works during the Defect and Liability Period and to carry out all the breakdowns. All materials, replacement parts, equipment, consumable items, labour etc., required for the repair and maintenance of the installations, works, plants, equipment etc., during the Defect and Liability Period shall be provided by the Contractor.
- 12.3. The Contractor shall take immediate action to carry out any rectification work and restore the installation to its normal operating conditions upon receipt of the complaint form the officer in-charge of the END-USER or his representatives. If no action is taken to carry out the repair work within twenty four (24) hours upon lodging of the report, the Project Director shall reserve the right to engage a third party to carry out the rectification works with all the costs and expenses charged to the Contractor.
- 12.4. This team of personnel shall work hand in hand with the members of the END-USER maintenance team such as to effect proper transfer technology from the Contractor to the END-USER personnel.
- 12.5. The Contractor shall ensure that the availability of adequate spares for the system is being provided to the field service support in order to avoid delay in reinstating the network service.