Attachment A

to

RFP No. 4733

for the

STATE OF MISSISSIPPI

Cabling EPO

ITS Project No. 48786

Technical Specifications

1. Cabling EPO Categories

1.1. Materials

1.1.1. This category covers all the materials needed for installation projects performed for Category 2: installation and labor.

1.1.2. The following is a non-exhaustive list of in-scope materials: copper and fiber optic communications cable, termination and connectivity components, racks, enclosures, cable management, grounding materials, labeling materials.

1.1.3. Specifically excluded are network electronics.

1.2. Installation and Labor

1.2.1. Copper Testing - Vendor must test all copper cables in accordance with ANSI/TIA/EIA-568-B.1 standards for wire map, attenuation, length, NEXT (pair-to-pair and power sum), FEXT and ELFEXT (pair-to-pair and power sum), return loss, propagation delay, and delay skew.

1.2.2. Fiber Testing - Vendor must test all fiber cables for length, polarity, and attenuation at 850 nm or 1300nm for 50/125 micron multimode (MM) and 1310 nm or 1550 nm for the appropriate single mode (SM) cable in at least one direction. Length must be tested using an OTDR. The warranty shall be for link and/or channel coverage for horizontal and backbone cables. The testing performed must be done in accordance with the type of warranty required. Any link not meeting the requirements of the standard shall be brought into compliance by the Vendor, at no charge to the state entity.

1.2.3. Construction Specifications

1.2.3.1. All UTP (Unshielded Twisted Pair) communication cable for data must be CAT 6 or better.

1.2.3.2. The National Electrical Safety Code shall be used as a minimum requirement only and not as a design criterion.

1.2.3.3. All applicable city, state, and federal construction standards and practices associated with the installation of communications cabling systems shall be followed.

1.2.3.4. All Vendors and subcontractors will be responsible for adhering to all safety and construction guidelines and/or OSHA safety requirements during all work operations. OSHA guidelines and rules shall be followed and are subject to review by **ITS** and the state entity.

1.2.3.5. The successful Vendor shall coordinate with the state entity as to time intervals of cable placement and splicing.

1.2.3.6. Hallways and sidewalks shall be kept free of debris, scaffolds, etc., at all times.

1.2.3.7. Appropriate safety barricades, traffic control devices, and other such devices shall be utilized where necessary.

1.2.3.8. It is the Vendor's responsibility to provide cable in sufficient lengths to ensure network connectivity.

1.2.3.9. Steel-winch cable will not be allowed to pull cable into conduit.

1.2.3.10. Internal and external penetrations should be cored, sleeved, and sealed with a fire stop.

1.2.3.11. Forty-eight (48) hours prior to any construction work operation or material storage, the successful Vendor shall notify the state entity. The Vendor shall not store materials without prior approval from the state entity or its general contractor.

1.2.3.12. The location of all existing buried facilities shall be located and marked prior to any digging by the Vendor. The Vendor will be responsible for damage to any existing buried utilities.

1.2.3.13. All gas/diesel-motorized equipment shall have proper mufflers so as not to disturb the environment.

1.2.3.14. Backfill shall consist of approved sand-clay compacted to 95% standard protocol in 6" lifts, free from any pebble, stones, asphalt, concrete, "frozen" material, etc., which could cause penetration or damage to the conduit(s).

1.2.3.15. Trenches shall be backfilled to contours and elevations of undisturbed surrounding terrain.

1.2.3.16. Any unused backfill material shall be removed from the property.

1.2.3.17. All outside plant cable terminations that are in excess of 50 feet inside the building shall be placed in EMT (Electrical Metal Tubing), be rated as an indoor/outdoor type cable, or be transitioned (spliced) to indoor/riser rated cable.

1.2.3.18. All BICSI standards and recommendations should be adhered to for all separation distances between communication cable and existing utilities.

1.2.4. Conduit Overview

1.2.4.1. The conduit placed at a given location must have a true cylindrical shape and be supplied by the same manufacturer.

1.2.4.2. All vacant conduit shall be equipped with a polyethylene pull rope.

1.2.4.3. Each conduit terminated either in handhole or building shall be sealed and/or plugged to prevent gas/moisture seepage.

1.2.4.4. For all trench radius sweeps of 40' or greater, conduit shall be manually placed and anchored in trench prior to backfill.

1.2.4.5. All conduit trenches in tree drip lines that are not bored shall be hand trenched, tunneling any roots greater than 1¼" in diameter.

1.2.4.6. Underground conduit shall be a minimum Schedule 40, Polyvinyl Chloride (PVC) conduit.

1.2.4.7. When trenching, a detectable warning tape shall be placed 12" below grade in all conduit trenches and a minimum of 12" above conduit. Tape shall run from handhole to handhole.

1.2.4.8. A #12 AWG copper locate wire shall be installed in all conduit runs and terminate at each building entrance handhole.

1.2.4.9. All sidewalk removal shall be from expansion joint to expansion joint.

1.2.4.10. Temporary wooden walkways shall be provided where sidewalk removal is required.

1.2.4.11. Sidewalk restoration shall match the sidewalk being removed. Grades and alignment shall match the existing topology.

1.2.4.12. Sidewalk replacement shall be 3000 psi and poured at a maximum slump of 4 inches.

1.2.4.13. Expansion joints shall be either ½" asphalt saturated fiberboard or redwood on 4' centers.

1.2.4.14. No concrete for sidewalk or trench cap shall be poured if weather conditions are forecasted to be 40°F or below for the next 72 hours (3 days).

1.2.5. Service Entrances

1.2.5.1. The total number of bends in a conduit section run shall not exceed two 90° bends or equivalent of radius bends. Each bend shall have a minimum radius in accordance with existing standards.

1.2.5.2. The ends of metallic conduit shall be reamed, bushed, and grounded in accordance with the National Electric Code.

1.2.5.3. All service entrances shall have a 20 foot service loop in ceiling area.

1.2.5.4. All service entrances shall be sealed.

1.2.5.5. Conduit shall be installed at a minimum depth of 24" to the top of the conduit and backfilled with selected fill material.

1.2.5.6. Conduits terminated inside a building shall be installed so that the conduit extends a maximum of 4" Above Finished Floor (AFF). Conduits shall be plugged with inserts to ensure that foreign matter does not enter the building.

1.2.6. Installation of Handholes

1.2.6.1. Each cable in the handhole(s) and entering the building(s) shall have a permanent identification tag with cable number and identified cable count.

1.2.6.1.1. Handhole shall be set flush with the existing topographical grade.

1.2.6.1.2. Traffic covers shall be locking type by bolts and two wrenches for unlocking shall be furnished to the appropriate state entity.

1.2.6.1.3. Upon completion of handhole placement, necessary anchoring is required to prevent floating until backfill is complete.

1.2.6.1.4. If not specified by the customer, all handholes shall have “Communications” logo on locking cover.

1.2.6.1.5. Upon completion of the conduit/handhole placement, each access chamber shall be checked for gas prior to any cable pulls. If gas is detected, it shall be corrected at the Vendor’s expense.

1.2.6.1.6. All handholes shall be placed on 12" minimum washed gravel.

1.2.6.1.7. All handholes shall have an open bottom.

1.2.7. Installation specifications

1.2.7.1. All installation shall be in conformance with ANSI/TIA/EIA and BICSI standards. The Vendor will be required to have a BICSI Registered Communication Distribution Designer (RCDD) available for the project to ensure that all applicable standards are met.

1.2.7.2. The Vendor agrees to comply with all city, county, state, and federal codes, rules, NEC and Rural Utilities Service (RUS) codes, regulations, and/or agencies, regarding the installation of the system.

1.2.7.3. All hardware shall be installed and working per manufacturer specifications.

1.2.7.4. The Vendor shall:

1.2.7.4.1. Provide all labor and materials to install all equipment as necessary to the project.

1.2.7.4.2. Provide documentation and ensure continuity of the system as described in this RFP.

1.2.7.4.3. Furnish all licenses and permits, etc. required for the installation of the system.

1.2.7.4.4. Ensure that the maximum pulling tensions of the specified distribution cables are not exceeded, and cable bends maintain the proper radius during placement.

1.2.7.5. The Vendor will install fiber optic cable in innerduct to protect from damage.

1.2.7.6. Cable shall not be formed into a condition that causes the outside sheath to wrinkle. A “wrinkle” occurs as the result of an installer exceeding the manufacturer’s bend radius.

1.2.7.7. All cables and wire shall be firmly fastened in place. Cable clamps and support hardware shall be adequate to support their loads.

1.2.7.8. If the Vendor places any cable within one foot of a steam line or pipe in excess of 100°F, the cable(s) shall be protected with sufficient insulation so as not to damage the sheath or innersheaths/wire.

1.2.7.9. All firewall penetrations shall be sealed as required by code.

1.2.7.10. In the event the cable or sheath is damaged or pulling devices separate from the cable, the cable shall be inspected by the using state entity before re-pulling is attempted.

1.2.7.11. The use of bridge taps is not allowed for data applications.

1.2.7.12. All fiber cables shall be tagged within 24 inches of the termination. All voice or data cables shall be tagged at each end with a voice or data cable number reflecting the size, count, and number of the cable.

1.2.7.13. There shall be no splicing of the horizontal communications cable.

1.2.7.14. All patch-panels shall be Underwriter’s Laboratories (UL) listed.

1.2.7.15. Any unused materials that have been purchased by the State must be turned over to the State upon completion of the project.

1.2.7.16. The distance from the termination in the telecommunications closet to the outlet shall be 90 meters (295 ft) or less for Category 6 or better cable.

1.2.7.17. The length of patch cords and cross-connect jumpers in the telecommunications closet shall be 20 ft or less.

1.2.7.18. The amount of pair untwisting as a result of the termination shall not exceed ¼ inch for Category 6 or higher cables.

1.2.7.19. The Vendor is to install horizontal cable no closer than 6 inches from fluorescent lighting fixtures.

1.2.7.20. All telecommunications outlets shall be placed a minimum 15 inches from the floor in conformance with the American Disabilities Act (ADA).

1.2.7.21. The hardware used to terminate UTP cables shall be of the insulation displacement contact (IDC) type.

1.2.7.22. All exposed cable bundles are to be secured with Velcro.

1.2.7.23. Wall mountable termination hardware shall be placed on 3/4" plywood securely fastened to the walls and painted on all sides with fire-resistant paint.

1.2.7.24. Cable management hardware such as horizontal and vertical panels should be used to reduce cable stress in the telecommunications closet.

1.2.7.25. The color of the surface raceway and outlet/connector shall be approved prior to installation by the state entity contact.

1.2.7.26. All cable ties shall be hand-tightened only to a point where the sheath does not deform.

1.2.7.27. Any outlet/connector not installed flush with the wall surface shall be securely mounted.

1.2.8. Bonding and Grounding

1.2.8.1. The Vendor shall be responsible for providing an approved ground at all newly installed distribution frames, and/or ensuring proper bonding to any existing facilities.

1.2.8.2. The Vendor shall also be responsible for ensuring ground continuity by properly bonding all appropriate cabling, closures, cabinets, service boxes, and framework.

1.2.8.3. All grounds shall consist of #6 AWG copper wire and shall be supplied from an approved building ground and bonded to the main electrical ground.

1.2.8.4. Grounding must be in accordance with the NEC, NFPA, and all local codes.

1.2.9. Power Separation - The Vendor shall not place any distribution cabling alongside power lines, or share the same conduit, channel or sleeve with an electrical apparatus.

1.2.10. Miscellaneous Equipment - The Vendor shall provide any necessary screws, anchors, clamps, tie wraps, distribution rings, wire molding (MC/MDF & TC/IDF locations), miscellaneous grounding and support hardware, etc., necessary to facilitate the installation of the system.

1.2.11. Special Equipment and Tools

1.2.11.1. It shall be the responsibility of the Vendor to furnish any special installation equipment or tools necessary to properly complete the project.

1.2.11.2. This may include, but is not limited to, tools for terminating cables, testing and splicing equipment for copper/fiber cables, communication devices, jack stands for cable reels, or cable winches.

1.2.12. Aerial Placement

1.2.12.1. Guy wire guards shall be placed over guy on all riser poles at a minimum of 8 ft from ground level.

1.2.12.2. The pole to building span shall be no greater than 30 meters (100 ft) with a minimum clearance of 18 ft.

1.2.12.3. The Vendor shall utilize standard industry hardware to attach aerial cable at pole locations (strand vices, guy hooks, cable suspension clamps, corner suspension clamps, etc.).

1.2.13. Labeling

1.2.13.1. The Vendor shall be responsible for printed labels for all cables and cords, distribution frames, and outlet locations.

1.2.13.2. The Vendor will be responsible for working with the state entity on an acceptable cable numbering scheme and will be responsible for providing a complete set of cable records.

1.2.14. Testing and Acceptance

1.2.14.1. The system shall provide all features and capabilities at time of acceptance as stipulated in these specifications and responded to in the affirmative. All features and capabilities shall be trouble-free and operate with high reliability.

1.2.14.2. Acceptance of the described labor and materials will be the responsibility of the state entity, who will accept the system and provide payment when the following criteria have been met:

1.2.14.3. Quality of materials must be consistent with published specifications for materials.

1.2.14.4. System test results must meet or exceed accepted industry standards.

1.2.14.5. Vendor test results will be provided to the state entity in the form of a digital copy prior to system acceptance.

1.2.15. Restoration

1.2.15.1. The successful Vendor for each awarded project shall be responsible for replacing, repairing, or bringing back to at least original condition any damage to floors, ceiling, walls, furniture, ground, pavement, sidewalks, etc., caused by its personnel and operations, subject to final approval by **ITS** or the Customer.

1.2.15.2. Any damage caused by the Vendor shall be restored at the Vendor's expense.

1.2.15.3. The Vendor shall compensate the State for any loss of utility service or damage caused by the Vendor's work operations.

1.2.15.4. It is required that minimum restoration of penetrations of walls shall be sealed and consist of grouting, reinforcement, and restoration to as near original finish as possible around duct entrances.

1.2.15.5. The Vendor shall, upon completion of all work, remove from the premises all construction equipment, unused materials, salvage materials, and debris resulting from the work. The Vendor shall leave the project site clean.

1.2.16. Errors and Omissions

1.2.16.1. Standards and requirements included in this RFP are to our knowledge the best and most correct standards and requirements of which we are aware.

1.2.16.2. If, for **any** reason, these standards and requirements change, or you judge any of these standards and requirements as incorrect or inadequate, **please notify ITS immediately**.

1.2.16.3. You must respond with EXCEPTION in your initial proposal to this RFP for any standards or requirements you judge to be incorrect or inadequate.

1.2.16.4. When new or better standards and requirements have been pointed out, accepted and changed, you must return responses to solicitation requests that reflect the correct and accurate standards and requirements.

1.2.16.4.1. If an error regarding the standards and requirements is detected or a better set of standards and requirements is implemented, **ITS** will distribute this information to all Vendors in the selected groups.

1.2.16.4.2. If you are selected to be in a group of Vendors for this RFP but are unable to perform under the new standards and requirements, you may withdraw from the group by informing **ITS** in writing.

1.2.16.4.3. Anything not listed in your detailed price quotes in response to solicitations, which is necessary for full and successful installation of inside/outside cable projects in accordance with standards and requirements, shall be provided at the expense of the Vendor.

1.2.16.4.4. All work installed under this proposal, which in **ITS**' opinion is not properly coordinated, causes interferences, or deviates from installation standards (without the permission of **ITS**) shall be corrected at the Vendor's expense.

2. Warranty

2.1. A twelve (12) month on-site system warranty covering all materials and labor to correct any defect in the cable system, and installation shall be part of the proposal. If the State provides materials separately, the warranty will apply only to the installation. **WARRANTY WILL BEGIN UPON ACCEPTANCE OF THE INSTALLED SYSTEM, WITH ACCEPTANCE BEING AS DEFINED IN THE MASTER CABLING AGREEMENT.**

2.2. Cable Plant Warranty:

2.2.1. Vendors must ensure an approved inspection for any cable plant for which the manufacturer requires a post installation inspection in order to receive the manufacturer's warranty.

2.2.2. Vendors must only propose those manufacturers for which they are certified. This includes certification for manufacturers that will only extend the warranty or enhanced warranties or guarantees when the cable plant is installed by an authorized installer/vendor.

3. Pricing Requirements

3.1. Cost for cabling materials and labor are not requested as part of the Vendor's RFP response. These costs will be solicited on a project-by-project basis.

3.2. Travel charges

3.2.1. Vendors may not charge for out-of-state travel.

3.2.2. Travel fees that are negotiated between the Vendor and Customer should include the following considerations:

3.2.2.1. Is the cost estimate for one-way or two-way travel?

3.2.2.2. Is the cost estimate per person or per vehicle?

3.3. Per Diem charges for meals, mileage, hotels, airfare, etc. are not authorized under this RFP. Should a project involve extended on-site work involving such expenses, those per diem charges should be itemized in the cost estimate. The authority for such expenditures would be using other public purchasing procedures. In no event should travel expenses be proposed or invoiced at rates exceeding the reimbursement rates defined by the Mississippi Department of Finance and Administration, Office of Purchasing, Travel and Fleet Management (DFA-OPTFM) for Mississippi state government.

3.3.1. Cabling Vendors may not charge for an on-site walk-through.

3.3.2. All products must be delivered **FOB destination** to any location within the geographic boundaries of the State with **all transportation charges prepaid and included in the proposal price**. Destination is the point of use.