SECTION 905 -- PROPOSAL (CONTINUED)

I (We) hereby certify by execution of the Section 905 proposal below, that all certifications, disclosures and affidavits incorporated herein are deemed to be duly executed in the aggregate, fully enforceable and binding upon delivery of the bid proposal. I (We) further acknowledge that this certification shall not extend to the bid bond or alternate security which must be separately executed for the benefit of the Commission. This signature does not cure deficiencies in any required certifications, disclosures and/or affidavits. I (We) also acknowledge the right of the Commission to require full and final execution on any certification, disclosure or affidavit contained in the proposal at the Commission's election upon award. Failure to so execute at the Commission's request within the time allowed in the Standard Specifications for execution of all contract documents will result in forfeiture of the bid bond or alternate security.

Bidder acknowledges receipt of and has added to and made a part of the proposal and contract documents the following addendum (addenda):

ADDENDUM NO.	**1**	DATED	**10/20/2015**	ADDENDUM NO.		DATED	
ADDENDUM NO	**2**	DATED	**10/22/2015**	ADDENDUM NO.		DATED	

Number	Description
1	Revised TOC; Delete NTB No. 4740; Bid Items; Plan Sheet Nos. 2, 4, 5, 8, & 9A-16A; Amendment EBS Download Required.
2	Revised NTB No.5831; Amendment EBS Download Required.

TOTAL ADDENDA: **2**
(Must agree with total addenda issued prior to opening of bids)

Respectfully Submitted,

DATE _____

_____
Contractor

BY _____
Signature

TITLE _____

ADDRESS _____

CITY, STATE, ZIP _____

PHONE _____

FAX _____

E-MAIL _____

(To be filled in if a corporation)

Our corporation is chartered under the Laws of the State of _____ and the names, titles and business addresses of the executives are as follows:

President	Address
Secretary	Address
Treasurer	Address

The following is my (our) itemized proposal.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SECTION 904 - NOTICE TO BIDDERS NO. 5831 **CODE: (SP)**

DATE: **10/22/2015**

SUBJECT: **Location & Configuration of Communication Nodes**

PROJECT: **CM-0017-00(041) / 106852301 – Desoto County**

Communications Node

Bidders are hereby advised

- All OTN equipment, Chassis and Cards shall be paid under Pay Item 907-660-A.
- The OTN Node Communications Hut, Communications Node Vault, and Communications Node Training shall be paid under Pay Item 907-660-B
- OTN Node Training shall be paid under Pay Item 907-660-C
- The equipment, labor, and configuration required at Termination Cabinets that is not covered under the associated pay items below shall be considered incidental and paid for under TMC Modifications Pay Item 907-659-A; ITS Equipment Cabinets (907-637-A); Fiber Optic Cable (907-657-A or B; Networking Equipment (907-658-A).

OTN Nodes Components to be provided are provided in the table below.

Table 1 - OTN Node Locations & Configurations					
Item Description	Part No.	Total #		I-55 @ I-69	US Hwy 78
NODE CHASSIS and POWER SUPPLIES					
N7024CF (24 combo ports)	S30826-B42-X701	2		1	1
Power supply 90-264 Vac for N50, N70 (1000 W)	V30812-A5020-A71	4		2	2
Power cord 110Vac for N7x-nodes - USA - 2,5m	V30812-A3060-A13	4		2	2
COMMON LOGIC CARDS & OPTICAL TRANSCEIVERS					
Bora 10G /N70 XFP optical transceivers					
M-optic module for OTN-X3M@10G (multimode, 850 nm)	V30813-S21-A1	2		1	1
S1-optic module for X3M@10G (1310nm)	V30813-S24-A1	2		1	1
Optical GbE SFP 1310nm singlemode - LX	V30813-S20-A2	32		16	16

NETWORK MANAGEMENT / MAINTENANCE SOFTWARE					
OMS license for one N70	AG-L398	2		1	1

*The contractor shall provide the appropriate number of Back panels to cover empty card slots.

Part Numbers are provided for informational purposes and are subject to change by the manufacturer. Any part substitutions due to revision or version changes must be approved by the MDOT Project Manager. Not all required ancillary components are shown in the table above; however, these shall be provided as part of the OTN Node to comprise a fully functional and operable final system. This may include but is not limited to, network management / maintenance software licensing, optical transceivers, node chassis and power supplies. All required OTN components shall be included in the price bid for Item No. 907-660-A.

OTN Node Communication HUT – Site #1

An OTN Node Communication Hut, Vault, and grounding system, located in the southwest quadrant of the interchange of Interstate 55 with Interstate 69, will be provided as part of this project and shall be paid under Pay Item 907-660-B.

OTN Node Installation, Configuration – Site #1

- An OTN Node shall be installed, connected, configured, and shall be paid under Pay Item 907-660-A.
- The OTN node shall have a minimum of a 40 Gbps Ethernet backplane.
- The Type C Network Switch will be provided as indicated in Plans under Pay Item Number 907-658-A Network Switch, Type C.
- All other parts, components, installation, configuration, and cabling of the Communications node and ITS equipment located in the Communication hut shall be paid under Pay Item 907-660-B

- The Contractor shall be responsible for all coordination, installation, materials, and any equipment necessary to install an AT&T METRO-E leased line service that is part of the MPLS service to the Statewide TMC network into the Site #1 Communication HUT.
- The Contractor shall provide and configure a **Cisco 2811 router** to connect and interface to the MPLS network on the AT&T leased line.
- The Contractor shall provide the address of the Site #1 Communications HUT and any information required for AT&T to provide METRO-E service to the Communications HUT.
- The Contractor shall provide service during project and burn-in period.
- The Contractor shall arrange for transfer of Service to MDOT after project acceptance as directed by the MDOT ITS Program Manager.
- The Contractor shall be responsible for installing the OTN interface cards identified in **TABLE 1** above and configuring them to be integrated to the MDOT ITS network as approved by the ITS Program Manager or his/her designee.
- **Work on OTN Node equipment must be done by a technician certified on the OTN Node technology.**
- The OTN Node shall connect via two (2) - 10 Gigabit links to the OTN Node in the Site #2 Communications Hut located on US Highway 78.
- The Contractor shall interface and configure the Site #1 OTN Node to the Site #2 OTN Node to provide communications between the HUTs and field elements connected to the HUTs and Termination Cabinets.
- The Type C Network Switch as specified in special provision 907-658 will be connected by the Contractor in the Hut as follows:
  - The contractor is responsible to mount the Type C network switch in the Contractor provided 19 inch racks at the Communications Node Huts.
  - The contractor shall provide fiber optic patch cords at least 6 ft in length. In addition, the contractor shall provide 10 spare fiber optic patch cords per Communication Node Hut.
  - The Contractor shall submit to the ITS Engineer for approval, a cable connection diagram done in Visio and an excel spreadsheet with port connections one week prior to connecting the Type C switches in the HUT buildings.
    - The Type C Network Switch shall connect via a Gigabit link to the Contractor provided **Cisco 2811 router.**
    - The Contractor shall interface and configure the Type C switch to the **Cisco 2811 router** to provide communications from the HUT and field elements connected to the HUT to the MDOT Statewide TMC.
    - The Contractor shall connect one of the uplink ports on the Type C network switch to one of the Gigabit optical ports on the card on the OTN Node at each location as directed by the ITS Engineer.
    - The connection between the Type C Network Switch and the OTN card shall be made via a 6ft fiber optic patch cable.
    - The Type C Network Switch shall connect via a Gigabit link to the Type E Network Switch in the Termination Cabinet located in the northeast quadrant of the intersection of US Highway 51 with MS Highway 302/Goodman Rd.
    - The Type C Network Switch shall connect via a Gigabit link to the Type C Network Switch in the equipment room of the Southaven Combined TMC located at 8791 Northwest Drive, Southaven, Mississippi (Police Department)

- Type C Switch shall be provided with SFP-based network module(s) with a combined minimum of 48 Gigabit Ethernet fiber access ports and 6 Gigabit Ethernet fiber uplink ports.
- The Contractor shall provide the greater of: The number of ports populated with SFP modules as the number indicated in the table below, or 6GE uplink port modules and Twenty (20) 1000SFP modules.
- The ports, as listed in the table below, from each of the appropriate 72 fiber termination panels will connect in pairs to the SFP (Optical ports) of the Type C Network Switch via appropriate single mode fiber optic patch cords unless otherwise directed and/or approved by the ITS Engineer or his designee:

	Buffer Tubes	
Trunk	BL	OR
I-55 South of I-69		13-24
I-69 West of I-55		13,14,23,24
I-55 North to MS 302 West	1-4	13-24
I-55 North of I-69	1-4	13-24
I-55 to US 78 HUT	1-4 *	

* Connection between OTN Nodes

- WEB based rack mounted remote environmental monitoring system with the following elements:
  - H.264 IP based PTZ camera provided per SPECIAL PROVISION NO. 907-650 shall be connected to the Network Switch in the HUT via network cables.
  - Environmental sensors for heat and humidity
  - Power monitoring sensor
  - Alarm management system with email forwarding function

OTN Node Communication HUT – Site #2

Site #2 is the existing Communication Hut located on the north side of US Highway 78 approximately one (1) mile northwest of the interchange with Interstate 269. shall be paid under Pay Item 907-660-B.

OTN Node Installation, Configuration – Site #2

- The replacement of the existing OTN Node and all parts, components, cabling, and the installation and configuration of the switch, ITS equipment, and proposed OTN node shall be paid under Pay Item 907-660-A.
- The proposed OTN node shall have a minimum of a 40 Gbps Ethernet backplane.
- The Contractor shall be responsible for installing the OTN interface cards identified in **TABLE 1** above and configuring them to be integrated to the MDOT ITS network as approved by the ITS Program Manager or his/her designee.
- **Work on OTN Node equipment must be done by a technician certified on the OTN Node technology.**
- As stated under Site #1 above, the OTN Node at Site #2 shall connect via two (2) - 10 Gigabit links to the OTN Node in the Site #1 Communications Hut located at the interchange of Interstate 55 with Interstate 69.

- The Contractor shall interface and configure the Site #1 OTN Node to the Site #2 OTN Node to provide communications between the HUTs and field elements connected to the HUTs.
- The existing Type C Network Switch will be configured by the Contractor as follows:
  - The Contractor shall be responsible to determine the needs of the existing Cisco Switch located in the Site #2 Hut to provide the proper interfaces between the ITS field equipment and switches under the scope of this project.
  - If existing equipment must be moved, the contractor will coordinate with the ITS Engineer for movement of equipment.
  - The contractor is responsible for any re-cabling if existing equipment is moved to make room for the switch in the rack.
  - The Contractor shall provide, install, configure, and integrate any network cards and/or modules into the existing Cisco Switch and proposed OTN Node that are needed to meet these needs.
  - If the existing Cisco Switch does not have the free capacity to meet the determined needs, the Contractor will be required to provide and configure an additional Type C Switch and connect via fiber patch cables to the existing Switch.
  - The Contractor shall be responsible to provide and configure any needed interface cards, cards to support the additional GBICs or SPFs in the new and/or existing Network Switch.
  - Switch upgrades and interfaces at Site #2 must be submitted and approved by the Project Engineer and the ITS Engineer during submittals for network switches to be provided in this project.
  - The contractor shall provide fiber optic patch cords at least 6 ft in length. In addition, the contractor shall provide 10 spare fiber optic patch cords per Communication Node Hut.
  - The Contractor shall submit to the ITS Engineer for approval, a cable connection diagram done in Visio and an excel spreadsheet with port connections one week prior to connecting the Type C switches in the HUT buildings.
    - The Type C Network Switch shall retain the connection via a Gigabit link to the existing Cisco **2811 router.**
    - The Contractor shall reconfigure the Type C switch connection to the **Cisco 2811 router**, if necessary, to maintain communications from the HUT and field elements connected to the HUT to the MDOT TMC if needed to keep communications to existing devices active prior to final project acceptance.
    - The Contractor shall connect one of the uplink ports on the Type C network switch to one of the Gigabit optical ports on the ard on the OTN Node at each location as directed by the ITS Engineer.
    - The connection between the Type C Network Switch and the OTN card shall be made via a 6ft fiber optic patch cable.
    - The Type C Network Switch shall connect via a Gigabit link to the Type E Network Switch in the Termination Cabinet located in the southwest quadrant of the intersection of US Highway 78 westbound ramps with MS Highway 302/Goodman Rd.
    - The existing Type C Switch shall be provided with SFP-based network module(s) to provide a minimum of 4 additional Gigabit Ethernet fiber access ports and 4 additional Gigabit Ethernet fiber uplink ports.
    - The ports, as listed in the table below, from each of the appropriate 72 fiber termination panels will connect in pairs to the SFP (Optical ports) of the Type C Network Switch

via appropriate single mode fiber optic patch cords unless otherwise directed and/or approved by the ITS Engineer or his designee:

- The ports, as listed in the table below, from each of the appropriate 72 fiber termination panels will connect in pairs to the SFP (Optical ports) of the Type C Network Switch via appropriate single mode fiber optic patch cords:

	Buffer Tubes	
Trunk	BL	OR
US-78 North of HUT	1-8	13-24
US-78 South of HUT	Maintain existing connections	

OTN Node Training: A minimum of 24 hours of onsite training, testing, and support shall be provided for OTN Nodes and the MSTraffic network for a minimum of 8 people.

Termination Cabinets

US Highway 51 at MS Highway 302/Goodman Rd.

The proposed FO termination cabinet located in the northeast quadrant of the intersection of US Highway 51 with MS Highway 302/Goodman Rd. will be installed to terminate all 216 proposed and 96 existing FO trunk fibers. The FO trunk fibers indicated in the table below shall be connected to the proposed Type E switch. All labor, equipment and materials necessary for this work shall be included in the bid price for Pay Item Number 907-658-A. The Type E switch shall provide, at a minimum, SFP-based module(s) as follows:

- Two (2) Gigabit Ethernet SFP uplink modules
- Eighteen (18) Gigabit Ethernet fiber access ports

	Buffer Tubes			
Trunk	BL	OR	SL*	BK**
MS 302 West of US 51		13-24		
US 51 South of MS 302		13,14,17-24		
US 51 North of MS 302			49,50	85-96
MS 302 East of US 51	1-4			

* May actually be BL in the field

**May actually be BR in the field

US Highway 78 at MS Highway 302/Goodman Rd.

The proposed FO termination cabinet located in the southwest quadrant of the intersection of US Highway 78 westbound ramps with MS Highway 302/Goodman Rd. will be installed to terminate all 216 FO trunk fibers. An additional 72 FO fibers will be terminated here if Add Option #1 is completed. The FO trunk fibers indicated in the table below shall be connected to the proposed Type E switch. All labor, equipment and materials necessary for this work shall be included in the bid price for Pay Item Number 907-658-A. The Type E switch shall provide, at a minimum, SFP-based module(s) as follows:

- Two (2) Gigabit Ethernet SFP uplink modules

- Fifteen (15) Gigabit Ethernet fiber access ports

	Buffer Tubes	
Trunk	BL	OR
MS 302 West of US 78	**	13-24
US 78 North of MS 302*		13,14,19,20,23,24
MS 302 East of US 78		13-24
US 78 South of MS 302	5-8	

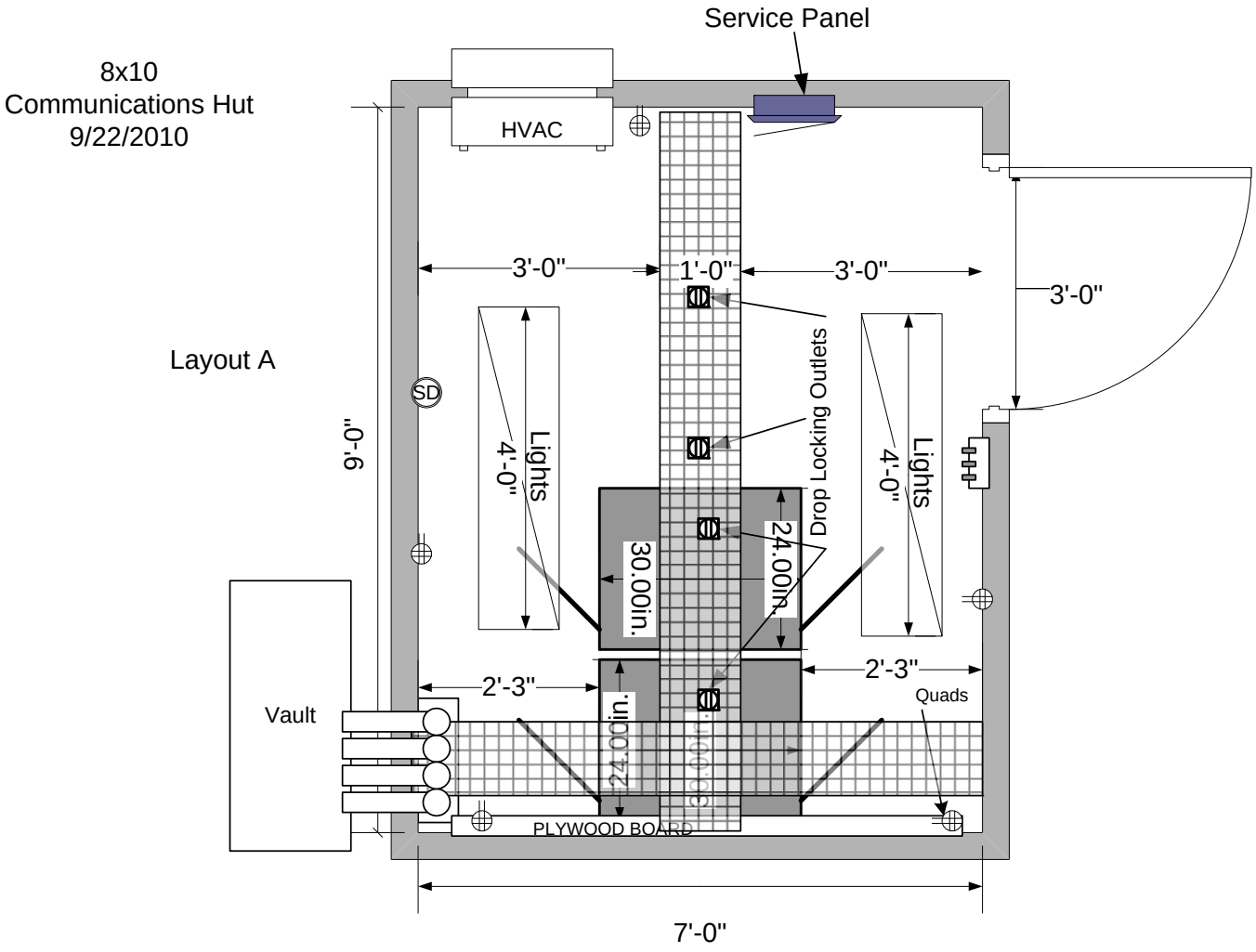
*Add Option #1

** BL 1-4 goes through the Termination Cabinet from US 78 hut to I-69 hut without going through the switch

Interstate 55 at Southaven Combined TMC

The proposed FO termination cabinet located on the west side of Interstate 55 across from the Southaven Police Department, approximately a quarter mile south of the Stateline Rd. interchange, will be installed to terminate all 288 FO trunk fibers. These four trunks will come from cutting the two existing 72 FO trunks in two. The four trunks will be A) the FO trunk to the PD that was from the south, B) the FO trunk to the PD that was from the north, C) the FO trunk that goes along Interstate 55 to the south, and D) the FO trunk that goes along Interstate 55 to the north. The FO trunk fibers shall be jumpered together such that the Blue tube of A) is connected to the Blue tube of C). All other tubes of C) shall be jumpered to D). All labor, equipment and materials necessary for this work shall be included in the bid price for Pay Item Number 907-637-A.

Layout of Communications HUT



8' x 10' outside Dimensions