

SECTION 905 -- PROPOSAL (CONTINUED)

I (We) further propose to execute the attached contract agreement (Section 902) as soon as the work is awarded to me (us), and to begin and complete the work within the time limit(s) provided for in the Specifications and Advertisement. I (We) also propose to execute the attached contract bond (Section 903) in an amount not less than one hundred (100) percent of the total of my (our) part, but also to guarantee the excellence of both workmanship and materials until the work is finally accepted.

I (We) enclose a certified check, cashier's check or bid bond for **five percent (5%) of total bid** and hereby agree that in case of my (our) failure to execute the contract and furnish bond within Ten (10) days after notice of award, the amount of this check (bid bond) will be forfeited to the State of Mississippi as liquidated damages arising out of my (our) failure to execute the contract as proposed. It is understood that in case I am (we are) not awarded the work, the check will be returned as provided in the Specifications.

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 6/18/2007 ADDENDUM NO. _____ DATED _____
ADDENDUM NO. _____ DATED _____ ADDENDUM NO. _____ DATED _____

Number	Description
1	Revised Table of Contents; Added Notice to Bidders No. 1628; Revised Pages 1-8 of Special Provision No. 907-656-01; Revised Diskette Required.

TOTAL ADDENDA: 1
(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:

_____	resident	Address
_____	Secretary	Address
_____	Treasurer	Address

The following is my (our) itemized proposal.

NH-9999-00(331) CT3N / 103811303, 304 & 305

Hinds, Madison & Rankin County(ies)



MISSISSIPPI DEPARTMENT OF TRANSPORTATION

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Hinds, Madison & Rankin Counties**

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SECTION 905 - PROPOSAL,
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(REVISIONS TO THE ABOVE WILL BE INDICATED ON THE SECOND SHEET
OF SECTION 905 AS ADDENDA)

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SECTION 904 - NOTICE TO BIDDERS NO. 1628

CODE: (SP)

DATE: 06/15/2007

SUBJECT: Pre-Bid Minutes

PROJECT: NH-9999-00(331) CT3N / 103811303, 304 & 305 -- Hinds, Madison & Rankin Counties

Attached are the minutes of this project's pre-bid meeting held on June 12, 2007.

MEETING NOTES
MDOT AUDITORIUM – JACKSON, MS

MEETING DATE: June 12, 2007

PARTICIPANTS: Mike Stokes — MDOT Traffic Engineering Division
Richard Chisholm — MDOT Construction Division
Doug Funchess — MDOT Construction Division
Rodney Chester — Gresham, Smith and Partners
Steve Mosher — Gresham, Smith and Partners
Earnest McAlpin — B & B Electric & Utility Co.
Dan Waggoner — B&B Electric & Utility Co.
Jeff Smith — Temple, Inc.
Keith Zelinski — Daktronics, Inc.
Tony Senger — McInnis Electric
Lynn Lewis — Lewis Electric
Frank Stock — Transcore

DISCUSSION: PRE-BID MEETING
JACKSON METRO INCIDENT MANAGEMENT PROJECT
FED. AID PROJ. NO. NH-9999-00(331)
FMS CON. NO. 103811 / 303000 – HINDS COUNTY
FMS CON. NO. 103811 / 304000 – MADISON COUNTY
FMS CON. NO. 103811 / 305000 – RANKIN COUNTY

The following occurred:

Richard Chisholm called the meeting to order and welcomed those in attendance. He then introduced Rodney Chester and turned the floor over to him.

Rodney asked that all attendees introduce themselves. He stated that the purpose of this meeting is to give potential bidders an opportunity to ask questions, especially since this project is the first of its type in the State of Mississippi. He stated that the meeting also gave an opportunity to point out some key items in the plans and specifications.

Rodney asked the attendees to take special note of the following in the Contract Book:

- Section 904 – Notice to Bidders: This provides information not found in the plans and specs. This also provides project-specific changes to the specs.
- NTB #1354 – DMS Comm. Interface Equipment: On this project, there are several methods for establishing communications between the MDOT TMC and the proposed DMS signs. These include communications over existing MDOT fiber optic cable, new MDOT fiber installed under this contract (i.e., extensions of existing MDOT fiber), and fiber leased from BellSouth. No separate measurement or payment will be made for the network switches and various other comm. devices required to establish these interfaces. Requirements for such devices are spelled out in this NTB.

- NTB #1355 – Fiber Optic Communications: This supplements Section 657 of the MDOT Standard Specifications (“Red Book”) and details various additions and changes to same. Please read closely.
- NTB #1356 – TMC Modifications: This is a supplement to Technical Special Provision #907-659-2. The Contractor may use the DMS vendor’s software to perform testing at the TMC; however, for final acceptance, DMS interfaces must be configured with the 360 software package. In addition, a 360 software vendor’s representative must be present during configuration. Contact Mark Brown at 205-388-7232 x224. Please note that the Contractor will not have to purchase the software, as it has already been acquired by MDOT and installed at the TMC. Also note that 64 hours of training must be provided by the Contractor. A 360 vendor’s representative must present during DMS training.
- NTB #1395 – Location & Configuration of OTN Nodes: Please note that MDOT maintains an existing OTN ring. Work under this contract will include installation of an additional node and hub building. This NTB spells out the required OTN components and configuration.
- NTB #1503 – Contract Time: Notice to Proceed will be given no later than Aug. 9, 2007. Work under this contract must be completed by Feb. 27, 2009. After this date, liquidated damages (LDs) will be assessed as set forth in the MDOT Red Book. A 6-month burn-in period is included in the contract time. Therefore, target date for Conditional Acceptance (CA) is six months prior to Feb. 27, 2009. CA will be granted and burn-in period will begin when all systems are up and running properly. Should a system failure occur during burn-in, one month will be added to the burn-in period.
- Special Provision 907-630-4: This spells out requirements for overhead sign supports. Please note that all structural details in the plans are schematic. These structures are to be Contractor-designed. Shop drawings for same must be submitted to the MDOT Bridge Division.
- Special Provision 907-656-1: This SP describes the various types of DMS assemblies to be installed. Type 1 signs are to be mounted on an overhead structure. Type 2 signs are to be installed on a roadside pedestal. A Type 1 shall be a walk-in assembly. For Type 2 signs, a walk-in assembly is not required. Please note that an addendum will be issued to revise this SP. Said addendum will allow front-access **or rear-access** enclosures for Type 2 signs. Also note that this SP references and includes all requirements of the NEMA TS-4 specification. All signs must be NTCIP-compliant. Refer to section 907-656-03.2.1 (p.111 of contract book), as it states that a DMS vendor’s representative must be present during DMS configuration. Various acceptance tests are to be performed over the life of the contract. Progress payments will be made based on testing milestones. This SP defines what constitutes a system failure, defines the burn-in period and spells out contractor responsibilities during this time (e.g., failure response times). At the end of the burn-in period, final inspection will be performed to verify overall system acceptance. Finally, this SP outlines warranty documentation requirements.
- Special Provisions 907-659-2 and 907-660-1: These provide general requirements for TMC modifications and for OTN node installations, respectively. Reference is made to corresponding NTBs for more detailed requirements.

Rodney asked the attendees to take special note of the following in the plans:

- Wk. Nos. SQ-1 and SQ-2: Please pay special attention to the footnotes attached to the various contract pay items. Note that a column is provided for the Contractor to record final installed quantities of each pay item. This will aid in preparation of as-builts.
- Wk. No. GN-1: Please refer to note #5, which states that all electrical services costs incurred over the life of the project shall be paid by the Contractor and included in other items.

Rodney advised that this will be a very high-profile project. He reiterated that the project is the first of its type in the State of Mississippi and is likely to attract a great deal of media attention. Therefore, the MDOT will require strict adherence to the contract plans, specifications and schedule. No leeway should be expected.

The following are questions asked by attendees, and the responses given:

- Q: Are fiber optic cable quantities close? How were they measured?
A: Yes, quantities should be close. Measurements were performed in the field and/or scaled from plans. Please note that cable slack is required in all pull boxes. No separate measurement or payment will be made for slack.
- Q: Does MDOT maintain a qualified vendors list for overhead sign structures?
A: No. However, design engineer must be licensed in Mississippi.
- Q: Is DMS structure #4 to be installed in the exact same location as the existing sign it is replacing?
A: No. Proposed sign location is offset from the existing sign.
- Q: Does MDOT maintain existing devices over Bellsouth fiber?
A: Yes. There a number of MDOT cameras in and around Jackson that communicate over Bellsouth fiber.
- Q: May DMS acceptance testing be performed on a location-by-location basis?
A: No. Conditional Acceptance will be granted all at once for the entire system.
- Q: Does MDOT require a particular scheduling software?
A: No. CPM scheduling is required; however, Contractor may use whatever software he wishes. MDOT foremost concern is the completion date.
- Q: Will schedule be furnished by MDOT or may Contractor propose?
A: Contractor may propose. Scheduling must be established at beginning of project. Contractor has flexibility in scheduling work, but should plan to complete work in time for 6-month burn-in period.
- Q: During burn-in, will a system failure require a whole new 6-month burn-in period?
A: No. Each system failure will add one month to the burn-in period.
- Q: Is there a specific configuration required for pedestal-mount DMS structures? A box truss or butterfly mount configuration appears to be most appropriate.
A: No. Plans are schematic only, as the MDOT and GS&P do not wish to dictate a particular design. Refer to the applicable NTB for specific requirements for all DMS structures (e.g., catwalk for overhead structures).

- Q: If a system failure occurs 5-1/2 months into the burn-in period and the resulting one month extension pushes the contract time beyond the required completion date, will LDs be assessed?
A: Yes.
- Q: Is the Feb. 27, 2009 date tied to the end of the burn-in period?
A: No. The end of burn-in and final acceptance shall end the contract time. This may occur prior to Feb. 27, 2009.
- Q: Are lane closures allowed only at night?
A: Yes. Refer to plans and NTB #1566 – Lane Closure Restrictions. Note that LDs are assessed for violations of these restrictions.
- Q: When are shoulder closures required?
A: They are required whenever the Contractor's operations encroach within 30 feet of the edge of traveled way (if not protected by barrier).
- Q: Are costs associated with hiring uniformed police officers to be absorbed? Which officers are to be hired?
A: Yes. Costs are to be absorbed. Officers will most likely be come from the Mississippi Highway Patrol, with assistance from the City of Jackson, MS.
- Q: Are there any locations where fiber is to be installed in existing conduit?
A: No.
- Q: Are there specific requirements for bridge-attached conduit transitions?
A: Yes. Refer to sheet 41 the plans for notes and details. Please note that cost of surface-mounted pull boxes is to be absorbed.
- Q: Which MDOT project office will be involved in this project?
A: The Whitfield Project Office.
- Q: Are there any special environmental considerations on this project?
A: No.
- Q: Where will railroad flagging be required?
A: There are three locations on the project where conduit is to be installed across railroad right-of-way. Refer to the plans for exact locations.

Rodney stated that minutes of this meeting will be distributed to all attendees, as will the aforementioned addendum. Tuesday, June 19th is the last day to submit questions.

This represents our understanding of the items discussed at this meeting. If you have any questions or comments concerning any of the information contained herein, please contact me.

Prepared by: Steve Mosher, PE
Project Engineer

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-656-1

CODE: (SP)

DATE: 06/18/2007

SUBJECT: Dynamic Message Sign

PROJECT: NH-9999-00(331)CT3N / 103811303, 304 & 305 -- Hinds, Madison & Rankin Counties

Section 907-656, Dynamic Message Sign, is hereby added to and made a part of the 2004 Edition of the Mississippi Standard Specifications for Road and Bridge Construction as follows

SECTION 907-656 --DYNAMIC MESSAGE SIGN

907-656.01--Description. This Special provision describes furnishing, installing and integrating a stationary electronic Dynamic Message Sign (DMS) assembly. The Contractor shall supply a complete operating Light Emitting Diode (LED) sign including the sign housing, sign controller unit (SCU), roadside DMS controller cabinet, all cabling, conduits, electrical service, surge suppression and all hardware associated with a complete installation as required by these Special Provisions.

The DMS assemblies will provide MDOT personnel with a means to visually communicate with motorists regarding any incidents, accidents, special events, travel times, etc., that may impact travel on the roadway network.

907-656.02--Materials.

907-656.02.1--Types of DMS. Each DMS shall be one of the following types:

- 1) DMS Type 1 shall meet the following requirements:
 - a) Shall be full matrix sign with a minimum of 125-pixel column and 27-pixel rows.
 - b) Pixel spacing shall be such that three lines of text (7x5 font characters) shall each have a nominal height of 18 inches.
 - c) The signs housing shall be a walk-in enclosure.
- 2) DMS Type 2 shall meet the following requirements:
 - a) Shall be full matrix sign with a minimum of 125-pixel column and 27-pixel rows.
 - b) Pixel spacing shall be such that three lines of text (7x5 font characters) shall each have a nominal height of 18 inches.
 - c) The signs housing shall be either a front access or rear access enclosure. A walk-in enclosure is not required for a Type 2 DMS but is allowed if preferred by the vendor.
- 3) DMS Type 3 shall meet the following requirements:
 - a) Shall be full matrix sign with a minimum of 75-pixel columns and 18-pixel rows.
 - b) Pixel spacing shall be such that three lines of text (7x5 font characters) shall each have a nominal height of 12 inches.

- c) The signs housing shall be either a front access or rear access enclosure. A walk-in enclosure is not required for a Type 3 DMS but is allowed if preferred by the vendor.

907-656.02.2--DMS Components. Each DMS shall include the following main components:

- 1) Sign Housing (walk-in or front access).
- 2) LED Modules.
- 3) LED Drivers.
- 4) Power Supplies
- 5) Roadside Cabinet.
- 6) Sign Controller
- 7) Transient Voltage Surge Suppression (TVSS)

907-656.02.3--References. This special provisions incorporates nonnative references to other standards as listed bellow. If a conflict between the standards referenced and this special provision, this special provision shall govern.

- 1) NEMA TS-4: NEMA TS4-2004, Hardware Standards for Dynamic Message Signs (DMS) with NTCIP Requirements. For this special provision only NEMA TS-4 requirements that apply to fixed signs locations shall be used.
- 2) NTCIP

907-656.02.4--Glossary of DMS Terms. The definitions of the terms used within this special provision are those terms defined in NEMA TS-4.

907-656.02.5--Environmental Requirements. Each DMS shall meet all of the performance and testing requirements as outline in Section 2 of NEMA TS-4 standard in addition to the following requirements:

- 1) TVSS shall be install at each of the following locations:
 - a) AC power service entrance into the DMS Cabinet before the main cabinet breaker.
 - b) AC power out to the DMS housing after the branch breaker.
 - c) AC power entrance into the DMS Housing before the main housing breaker.
- 2) The TVSS shall be designed meet IEEE C62.41 C3 conditions.
- 3) The TVSS shall provide
- 4) Each TVSS as a complete unit shall meet the following minimum electrical requirements:
 - a) Maximum Single Pulse Surge Current (8x20μs): 150kA (L-N), 150kA (L-G), 150kA (N-G)
 - b) UL 1449 SVR: 400v pk L-N and N-G.

907-656.02.6--Mechanical Construction. Each DMS shall meet all of the performance and testing requirements as outline in Section 3 of NEMA TS-4 standard in addition to the following requirements:

907-656.02.6.1--Vents and Filters. Each DMS vent and air filters shall meet the following requirements:

- 1) Air filters shall be installed between the intake vent and the fan.
- 2) Air filters must be replaceable, industrial grade, and pleated.
- 3) Shall completely cover the vent opening area.
- 4) Shall be manufactured per ASHRAE Standard 52.2P or Standard 52.1.
- 5) Shall be of fire retardant and water resistant construction, able to withstand temperatures up to 300° F.
- 6) Filter replacement is to be accomplished without tools with easy access.

907-656.02.6.2--Ventilation System. Each DMS shall incorporate a ventilation system meeting the following requirements:

- 1) The electric fans shall be designed for continuous duty.
- 2) Sign housing venting fan(s) shall have a minimum combined capacity to keep the signs housing internal temperature to a maximum of thirty (30) degrees Fahrenheit above external ambient temperature under the following conditions:
 - a) All pixels are on at maximum illumination level.
 - b) Maximum solar loading for the state of Mississippi.
 - c) Worse case humidity for the State of Mississippi.
- 3) LED cooling fans shall be provided to vent the air between the display module and the sign face cover.
- 4) Sufficient LED cooling fans shall be provided to keep the air surrounding the LEDs to a maximum temperature not exceeding the rated temperature for the LEDs.
- 5) Provide sign housing ventilation calculations and LED cooling calculations to show sufficient air circulation is provided to meet the special provision requirements.
- 6) The fan(s) shall be mounted within the housing.
- 7) The fan(s) shall be down stream from the air filters.
- 8) The sign housing venting fan(s) shall blow the air into the sign housing.
- 9) The DMS manufacturer shall determine the number, placement, and size of the electric fans.
- 10) The fans shall be thermostatically controlled.
- 11) The thermostat shall have a minimum adjustable range between 77° to 122°F (25° to 50°C).

907-656.02.6.3--Sign Face Material. The sign face material shall be replaceable from within the sign housing.

907-656.02.6.4--Sign Housing Construction. The DMS housing shall meet the following requirements:

- 1) Engineer shall approve sign housing dimensions.
- 2) The sign housing shall present a clean, unbroken, neat appearance.
- 3) The sign housing shall not have any visible text or logos on it.
- 4) The angular alignment of the sign housing shall be adjusted in the vertical direction down by three (3) degrees.
- 5) The sign housing shall be constructed of aluminum sheeting to be 5052-H32 and

structural members to be 6061-T6, per ASTM Specifications.

- 6) Aluminum sheeting shall be not less than 1/8 inch thick with all seams continuously welded by MIG (metal inert gas) welding or other approved method of similar strength.
- 7) The front of the sign housing shall have a flat black matte finish.
- 8) All other surfaces shall have a bare aluminum mill finish.
- 9) Weep holes shall be provided to allow moisture to escape.
- 10) The sign housing shall have an interior, non-skid walkway where the walkway shall extend the entire length of the sign housing.

907-656.02.6.5--Access Door. Walk in DMS housing shall include an access door meeting the following requirements:

- 1) Access to the interior of the sign case shall be via a gasketed door.
- 2) Gasketing shall be provided on all door openings and shall meet the following requirements:
 - a) Be dust-tight.
 - b) Meet NEMA 3R requirements
 - c) Permanently bonded to the door metal.
 - d) Shall not stick to the mating metal surface.
- 3) A gasket top channel shall be provided to support the top gasket on the door (in order to prevent gasket gravitational fatigue).
- 4) When the door is closed and latched, the door shall be locked. The lock shall meet the following requirements:
 - a) The lock and lock support shall be rigidly mounted on the door.
 - b) In the locked position, the bolt throw shall extend a nominal 0.25-inch into the latch cam area.
 - c) A lid or seal shall be provided to prevent dust or water entry through the lock opening.
 - d) The locks shall be Corbin # type and shall match the master number of the existing signs.
 - e) Two keys shall be supplied with each lock.
 - f) The keys shall be removable in the locked position only.
 - g) The locks shall have rectangular, spring loaded bolts.

907-656.02.7--Controller to Sign Interface. Each DMS shall meet all of the performance and testing requirements as outline in Section 4 of NEMA TS-4 standard.

907-656.02.8--Display Properties. Each DMS shall meet all of the performance and testing requirements as outline in Section 5 of NEMA TS-4 standard for outdoor sign using light emitting yellow color pixels in addition to the following requirements:

Pixels. Each pixel shall meet the following requirements:

- 1) DMS pixel shall be manufacture using Light Emitting Diodes (LED).
- 2) Pixels shall be replaceable either individually or in groupings. Groupings with three or more pixels shall be permitted only if bench level repairs and replacements to individual pixels are possible.

- 3) The failure of an LED in one string within a pixel shall not affect the operation of any other string or pixel.
- 4) Pixel power shall not exceed 1.5 watts per pixel, including the driving circuitry.

907-656.02.9--Optical Components. Each DMS shall meet all of the performance and testing requirements as outline in Section 6 of NEMA TS-4 standard in addition to the following requirements:

LED Technology. LEDs used to form each pixel shall meet the following minimum requirements:

- 1) The discrete, LED shall be a untinted, non-diffused, solid-state lamp that use Aluminum Indium Gallium Phosphide (AlInGap) technology manufactured by Avago Technologies (formerly Agilent Technologies), Toshiba Corporation, Nichia Corporation, or functional equivalent.
- 2) LED lenses shall be UV light resistant.
- 3) Each LED pixel shall be water resistant.
- 4) The manufacturer shall be the same for all LED's in all signs.
- 5) The LED's shall display an amber color at a wavelength of 590 nm (± 7 nm).
- 6) The LED shall have a 15° viewing angle with the half-power viewing angle defined such that at a given distance from the LED, luminous intensity measured at any point at an angle of 7.5 degrees from the LED's center axis is no less than half the luminous intensity measured directly on the LED's center axis.
- 7) All LEDs used in all DMS provided for this contract shall be from the same manufacturer and of the same part number, except for the variations in the part number due to the intensity and color bins.
- 8) LED life shall be nominally rated for 100,000 hours of operation under field conditions, which shall include operating temperatures between -22° and + 185° F (-30° and +85°C). LED life shall be defined as time it takes for the LED light output to degrade to half of the LED's initial light output.

907-656.02.10--DMS Controller Cabinet. Each DMS shall meet all of the performance and testing requirements as outline in Section 7 of NEMA TS-4 standard.

907-656.02.11--Electronics and Electrical. Each DMS shall meet all of the performance and testing requirements as outline in Section 8 of NEMA TS-4 standard in addition to the following requirements:

907-656.02.11.1--Communication Interfaces. The DMS controller shall support two Central Communication Ports (CCPs). One CCP shall be an Ethernet port, an the second CCP shall be a serial RS232 port..

907-656.02.11.2--Brightness Controls. The DMS light sensing and dimming control shall meet the following minimum requirements:

- 1) Sixteen (16) user selectable brightness levels shall be provided.

- 2) The controller shall monitor ambient light levels through a photo sensor assembly that senses the ambient illumination level using three (3) photodiodes oriented as follows:
 - a) Cell 1 - Monitors the change from "day" to "night".
 - b) Cell 2 - Facing towards oncoming traffic; monitors prevailing ambient light levels in the upstream traffic.
 - c) Cell 3 - Facing passed traffic; monitors prevailing ambient light levels in the downstream traffic.

907-656.02.11.3--NTCIP Protocol and Command Sets. As a minimum, the DMS hardware and software shall support the following NTCIP objects:

- 1) This specification references several standards through their NTCIP designated names and numbers. Each NTCIP Component covered by these project specifications shall implement the most recent version of the standard that is available as of project advertisement date, including any and all prepared Amendments to these standards as of the same date
- 2) Profile Implementation Conformance Specifications (PICS) for each NTCIP standard required shall be submitted for review and approval to the Department.

907-656.02.11.3.1--Ethernet Interface. Communication interfaces using Ethernet shall conform at a minimum with all mandatory objects of all mandatory Conformance Groups of the following standards:

- 1) 1101 -NTCIP Simple Transportation Management Framework (STMF)
- 2) 1203 -NTCIP Object Definition for Dynamic Message Signs
- 3) 2301 -NTCIP AP-STMF
- 4) 2202 -NTCIP TP-Internet
- 5) 2104 -NTCIP SP-Ethernet

907-656.02.11.3.2--RS-232 Interface. Communication interfaces using RS-232 shall conform at a minimum with all standards:

- 1) 1101 -NTCIP Simple Transportation Management Framework (STMF)
- 2) 1203 -NTCIP Object Definition for Dynamic Message Signs
- 3) 2301 -NTCIP AP-STMF
- 4) 2201 -NTCIP TP-Transportation Transport Profile
- 5) 2104 -NTCIP SP-PMPP/RS232

907-656.02.11.3.3--Subnet Level. For each communication interface, the Subnet Level shall meet the following minimum requirements:

- 1) NTCIP Components may support additional Subnet Profiles at the manufacturer's option.
- 2) At anyone time, only one Subnet Profile shall be active on a given communication interface.
- 3) The NTCIP Component shall be configurable to allow the field technician to activate the desired Subnet Profile.

907-656.02.11.3.4--Transport Level. For each communication interface, the Transport Level shall meet the following minimum requirements:

- 1) Communication interfaces may support additional Transport Profiles at the manufacturer's option.
- 2) Response datagrams shall use the same Transport Profile used in the request.
- 3) Each communication interface shall support the receipt of diagrams conforming to any of the identified Transport Profiles at any time.

907-656.02.11.3.5--Application Level. For each communication interface, the Application Level shall meet the following minimum requirements:

- 1) All communication interfaces shall comply with NTCIP 1101 and shall meet the requirements for Conformance Level 1 (NOTE -See Amendment to standard).
- 2) Optionally, the NTCIP Component may support SNMP traps.
- 3) A communication interface may support additional Application Profiles at the manufacturer's option.
- 4) Responses shall use the same Application Profile used by the request.
- 5) Each communication interface shall support the receipt of Application data packets at any time allowed by the subject standards.

907-656.02.11.3.6--Information Level. All communication interfaces Information level protocol shall meet the following minimum requirements:

- 1) All communication interfaces shall provide Full, Standardized Object Range Support of all objects required by these procurement specifications unless otherwise indicated below.
- 2) The maximum Response Time for any object or group of objects shall be 200 milliseconds.
- 3) All communication interfaces shall implement all mandatory objects of all mandatory Conformance Groups as defined in NTCIP 1203 and their respective Amendments.
- 4) Table 1 indicates the modified object requirements for these mandatory objects.
- 5) Table 2 shows the required minimum support of messages that are to be stored in permanent memory.
- 6) The sign shall blank if a command to display a message contains an invalid Message CRC value for the desired message.
- 7) Table 3 specifies the support of the required MULTI tags and their ranges.
- 8) Shall also implement all mandatory objects of the following optional conformance groups of NTCIP 1201.
 - a) Time Management Conformal Group
 - b) Report Conformal Group. Table 4 indicates the modified object requirements.
- 9) Implement all objects of the Font Configuration Conformance Group, as defined in NTCIP 1203. Table 5 indicates the modified object requirements for this conformance group.
- 10) Implement all objects of the DMS Configuration Conformance Group, as defined in NTCIP 1203.
- 11) Implement all objects of the Multi Configuration Conformance Group, as defined in

NTCIP 1203. Table 6 indicates the modified object requirements for this conformance group.

- 12) Implement all objects of the Multi Error Configuration, as defined in NTCIP 1203.
- 13) Implement all objects of the Illumination/Brightness.
- 14) Sign Status, as defined in NTCIP 1203.
- 15) Status Error, as defined in NTCIP 1203.
- 16) Pixel Error Status, as defined in NTCIP 1203.
- 17) Since the display of graphics is currently not defined within the NTCIP Standards or their amendments, the vendor shall propose, and provide detailed documentation (i.e., interface protocol description level), how the specified graphical shapes can be displayed.
- 18) Implement the optional objects listed in Table 7.