

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 6/16/2009 ADDENDUM NO. DATED
 ADDENDUM NO. DATED ADDENDUM NO. DATED

Number	Description
1	Revised Table of Contents; Revised Notice to Bidders No. 2583; Revised Notice to Bidders No. 2634; Added Notice to Bidders No. 2674; Added Notice to Bidders No. 2675; Replaced Special Provision No. 907-649-1 with 907-649-2; Removed Special Provision No. 907-651-3; Revised Bid Sheets; EBS Download 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:

_____ President	_____ Address
_____ Secretary	_____ Address
_____ Treasurer	_____ Address

The following is my (our) itemized proposal.

Revised 09/21/2005

STP-0003-01(086) / 103803301

Jackson County(ies)

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

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CERTIFICATION REGARDING NON-COLLUSION, DEBARMENT AND SUSPENSION,
SECTION 902 - CONTRACT FORM, AND SECTION 903 - CONTRACT BOND FORM,
OCR-485.

REVISIONS TO THE ABOVE WILL BE INDICATED ON THE
SECOND SHEET OF SECTION 905 AS AN ADDENDUM

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SECTION 904 - NOTICE TO BIDDERS NO. 2583

DATE: JUNE 12, 2009

SUBJECT: Specialty Items

PROJECT: STP-0003-01(086) / 103803301 - Jackson County

Pursuant to the provisions of Section 108, the following work items are hereby designated as "Specialty Items" for this contract. Bidders are reminded that these items must be subcontracted in order to be considered as specialty items.

CATEGORY: CURBING, SIDEWALKS, GUTTERS

Line No	Pay Item	Description
0370	609-D002	Combination Concrete Curb and Gutter Type 2
0380	609-D008	Combination Concrete Curb and Gutter Type 3A
0390	609-D009	Combination Concrete Curb and Gutter Type 3B

CATEGORY: EROSION CONTROL

Line No	Pay Item	Description
0170	220-A001	Insect Pest Control
0180	234-A001	Temporary Silt Fence
0190	235-A001	Temporary Erosion Checks
0860	907-225-A001	Grassing
0870	907-225-B001	Agricultural Limestone
0880	907-237-A001	Wattles

CATEGORY: MISCELANEOUS/ SPECIALTY WORK ITEMS

Line No	Pay Item	Description
0210	423-A001	Rumble Strips, Ground In

CATEGORY: PAVEMENT STRIPING AND MARKING

Line No	Pay Item	Description
0560	627-K001	Red-Clear Reflective High Performance Raised Markers
1050	907-626-A003	6" Thermoplastic Traffic Stripe, Skip White
1060	907-626-B004	6" Thermoplastic Traffic Stripe, Continuous White
1070	907-626-C003	6" Thermoplastic Double Drop Edge Stripe, Continuous White
1080	907-626-E003	6" Thermoplastic Traffic Stripe, Continuous Yellow
1090	907-626-F003	6" Thermoplastic Double Drop Edge Stripe, Continuous Yellow
1100	907-626-G004	Thermoplastic Detail Stripe, White
1110	907-626-G005	Thermoplastic Detail Stripe, Yellow
1120	907-626-H004	Thermoplastic Legend, White
1130	907-626-H005	Thermoplastic Legend, White

CATEGORY: DISPOSAL OF BUILDINGS, RIGHT OF WAY CLEA

Line No	Pay Item	Description
0020	202-B017	Removal of Concrete Combination Curb & Gutter
0050	202-B070	Removal of Sign Including Post & Footing

CATEGORY: SURVEY AND STAKING

Line No	Pay Item	Description
0830	699-A001	Roadway Construction Stakes

CATEGORY: TRAFFIC CONTROL - PERMANENT

Line No	Pay Item	Description
0570	630-A001	Standard Roadside Signs, Sheet Aluminum, 0.080" Thickness
0580	630-A002	Standard Roadside Signs, Sheet Aluminum, 0.125" Thickness
0590	630-C003	Steel U-Section Posts, 3.0 lb/ft
0600	630-E004	Structural Steel Angles & Bars, 7/16" x 2 1/2" Flat Bar
0610	630-K002	Welded & Seamless Steel Pipe Posts, 3 1/2"
0620	630-K003	Welded & Seamless Steel Pipe Posts, 4"
0631	635-A001	Vehicle Loop Assemblies
0632	636-A002	Shielded Cable
0633	638-A002	Loop Detector Amplifier, 4 Channel
0640	640-A016	Traffic Signal Heads, Type 1 LED
0650	640-A018	Traffic Signal Heads, Type 3 LED
0660	640-A019	Traffic Signal Heads, Type 5 LED
0670	640-A034	Traffic Signal Heads, Type 6 LED Countdown
0680	642-A008	Solid State Traffic Actuated Controllers, Type 8A
0690	643-A001	Closed Loop On-Street Master System
0700	644-A001	Optical Detector
0710	644-B001	Optical Detector Cable
0720	644-C002	Phase Selector, 4 Channel
0730	646-A001	Removal of Existing Traffic Signal Equipment
0740	647-A003	Pullbox, Type 4
0750	647-A005	Pullbox, Type 2
0760	648-A001	Radio Interconnect, Installed in New Controller Cabinet
0770	666-B015	Electric Cable, Underground in Conduit, IMSA 20-1, AWG 14, 5 Conductor
0780	666-B016	Electric Cable, Underground in Conduit, IMSA 20-1, AWG 14, 7 Conductor
0790	666-B022	Electric Cable, Underground in Conduit, IMSA 20-1, AWG 8, 2 Conductor
0800	668-A018	Traffic Signal Conduit, Underground, Type 4, 2"
0810	668-B024	Traffic Signal Conduit, Underground Drilled or Jacked, Rolled Pipe, 2"
0820	668-B025	Traffic Signal Conduit, Underground Drilled or Jacked, Rolled Pipe, 3"
1140	907-639-A007	Traffic Signal Equipment Pole, Type II, 17' Shaft, 40' Arm
1150	907-639-A009	Traffic Signal Equipment Pole, Type II, 17' Shaft, 60' Arm
1160	907-639-A011	Traffic Signal Equipment Pole, Type II, 17' Shaft, 35' Arm
1170	907-639-A012	Traffic Signal Equipment Pole, Type II, 17' Shaft, 45' Arm
1180	907-639-A015	Traffic Signal Equipment Pole, Type IV, 30' Shaft, 50' Arm
1190	907-639-A016	Traffic Signal Equipment Pole, Type IV, 30' Shaft, 55' Arm

CATEGORY: TRAFFIC CONTROL - PERMANENT

Line No	Pay Item	Description
1200	907-639-A018	Traffic Signal Equipment Pole, Type II, 17' Shaft, 65' Arm
1210	907-639-A019	Traffic Signal Equipment Pole, Type II, 17' Shaft, 70' Arm
1220	907-639-A020	Traffic Signal Equipment Pole, Type IV, 30' Shaft, 60' Arm
1230	907-639-A021	Traffic Signal Equipment Pole, Type IV, 30' Shaft, 40' Arm
1250	907-639-A031	Traffic Signal Equipment Pole, Type IV, 30' Shaft, 70' Arm
1260	907-639-A034	Traffic Signal Equipment Pole, Type VI, 8' Shaft
1280	907-639-A050	Traffic Signal Equipment Pole, Type IV, 30' Shaft, 65' & 55' Arms
1290	907-639-C002	Pole Foundations, 36" Diameter
1300	907-639-C003	Pole Foundations, 24" Diameter
1310	907-639-D001	Slip Casing, 36" Diameter
1320	907-639-D003	Slip Casing, 24" Diameter
1330	907-649-A001	Video Detection System, 1 Sensor

CATEGORY: TRAFFIC CONTROL - TEMPORARY

Line No	Pay Item	Description
0440	619-A1002	Temporary Traffic Stripe, Continuous White
0450	619-A2002	Temporary Traffic Stripe, Continuous Yellow
0460	619-A3006	Temporary Traffic Stripe, Skip White
0470	619-A5001	Temporary Traffic Stripe, Detail
0480	619-A6001	Temporary Traffic Stripe, Legend
0490	619-A6002	Temporary Traffic Stripe, Legend
0500	619-C6001	Red-Clear Reflective High Performance Raised Marker
0510	619-D3001	Remove and Reset Signs, All Sizes
0520	619-D4001	Directional Signs
0530	619-F1005	Portable Median Barrier, Less Than or Equal to 45 MPH
0540	619-F2002	Remove and Reset Portable Median Barrier

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SECTION 904 – NOTICE TO BIDDERS NO. 2634

CODE: (SP)

DATE: 06/16/2009

SUBJECT: Lane Closure Restrictions

PROJECT: STP-0003-01(086) / 103803301 -- Jackson County

Bidders are advised that lane closures will be limited as follows:

- No lane closures will be allowed on Eastbound Hwy 90 from 5:30 am to 8:00 am.
- No lane closures will be allowed on Westbound from 3:30 pm to 6:30 pm.

A lane rental fee of **\$2,500.00** per full or partial hour shall be assessed for lane closures or obstructions that extend beyond the times mentioned above. No exposed signs shall be viewable to the traveling public prior to or after the above mentioned times. No part of a lane closures, drums or cones, shall be in the roadway prior to or after the above mentioned times.

The Engineer can make adjustment as necessary depending on traffic and location within the project.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SECTION 904 – NOTICE TO BIDDERS NO. 2674

CODE: (SP)

DATE: 06/16/2009

SUBJECT: Estimated Quantities

PROJECT: STP-0003-01(086) / 103803301 -- Jackson County

Bidders are advised that the estimated quantities for excavation pay items shown on Plan Sheet No. EQ-02 / 18 does not compare with the quantities shown on the individual plan/profile sheets. Bidders are to use the quantities shown on the bid sheets as the correct estimated quantities for excavation pay items on this project.

Bidders are also advised that the estimated quantity for pay item no. 666-B, Electrical Cable, Underground in Conduit, IMSA-20-1, AWG 14, 7 Conductor, is not correct on the plan sheets. The correct quantity for this pay item is shown on the bid sheets.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SECTION 904 – NOTICE TO BIDDERS NO. 2675

CODE: (SP)

DATE: 06/16/2009

SUBJECT: Earthwork Quantities

PROJECT: STP-0003-01(086) / 103803301 -- Jackson County

Bidders are advised that of the estimated 8,750 cubic yards of 203-G, Excess Excavation, an estimated quantity of 4,625 cubic yards is unsuitable material.

Bidders are also advised that in order to balance the earthwork on the project it may be required to stockpile some material either on or off the project. **ALL** operations involved in, but not limited to, hauling, stockpiling, and re-working this material shall be paid for under pay item 203-A, Unclassified Excavation, LVM, AH.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-649-2

CODE: (SP)

DATE: 4/01/2009

SUBJECT: Video Vehicle Detection

Section 649, Video Vehicle Detection, of the 2004 Edition of the Mississippi Standard Specifications for Road and Bridge Construction is hereby amended as follows.

Deleted in total Subsection 649 beginning on page , and substitute the follows:

SECTION 907-649 -- VIDEO VEHICLE DETECTION

907-649.01--Description. This special provision specifies the minimum requirements for Video Detection Systems (VDS) furnished and installed in accordance with the design(s) for the location(s) designated on the project plans, in any related notice to bidders, or as directed. The work shall consist of providing all labor, materials, equipment, and incidentals necessary to furnish, install, test, and operate VDS that are integrated with MDOT's Traffic Management/Operations Centers (TMC).

The Type 1 Video Detection System will provide roadway monitoring capabilities via digitized video images transmitted over an Ethernet network and will provide traffic data collection of vehicle parameters including, but not limited to, speed, presence, occupancy, volume, video snapshots and MPEG-4 streaming video of the intersection. All of the real-time data shall be reported locally or remotely and be viewable from a customized secure user-friendly website hosted by the VDS vendor. The Type 1 Video Detection System will be used at all intersections where traffic data collection is required. The work shall consist of providing all labor, materials, equipment, and incidentals necessary to furnish, install, and test Video Detection Systems. This work consists of furnishing and installing video detection system equipment complete and ready for service.

The Type 2 Video Detection System will provide presence or pulse detection for Traffic Signal Controller inputs. The Type 2 Detection Systems will be used at intersections that only require presence detection for traffic signal control. The work shall consist of providing all labor, materials, equipment, and incidentals necessary to furnish, install, and test Video Detection Systems. This work consists of furnishing and installing video detection system equipment complete and ready for service.

907-649.02--Materials.

907-649.02.1--Materials Type 1 Vehicle Detection System.

907-649.02.1.1--General. The video detection system hardware will typically consist of two major components:

- 1) Video Camera Sensors (color) with zoom lens (one sensor in each direction)
- 2) Video Detection System Processor (inside the sensor for Type 1 system)

907-649.02.1.2--Functional Requirements for Type 1 Detection System. The VDS shall be capable of monitoring vehicles on a roadway via processing of video images and providing discrete detection of vehicles and functional detection parameters on a per lane basis for each of the following:

- 1) Presence of moving or stopped vehicles (a vehicle that has not moved for a user-definable length of time)
- 2) Traffic volume (absolute number of discrete vehicles per time interval per lane)
- 3) Speed (average lane speed in mph)
- 4) Occupancy (individual lane occupancy measured in percent of time)
- 5) Density (average lane density volume/speed)
- 6) Headway (average time interval between vehicles by lane in seconds)
- 7) Vehicle classification and volumes per lane by user-selectable vehicle lengths (minimum four (4) bins)
- 8) Wrong Way vehicle detection
- 9) Alarms for the following:
 - a. wrong-way vehicles
 - b. speed threshold
 - c. vehicle classifications
- 10) Loop Emulation based on single or dual loops for a minimum of four (4) lanes.
- 11) Provide direct real-time iris and shutter speed control and be equipped with an integrated auto zoom/auto focus lens that can be changed using computer software.
- 12) Shall be fully IP-enabled and addressable from the video detection system processor, with all configuration, detection data, and encoded video stream available on a single Ethernet interface.
- 13) Shall provide MPEG-4 streaming video output.
- 14) Shall provide all data and video communications over the power supply conductors as shown on the Plans.

907-649.02.1.3--System Features. As a minimum, the system shall include the following features:

- 1) Shall be capable of detecting and storing discrete lane data for either approaching or receding vehicles in at least four (4) lanes and two (2) shoulders / emergency lanes.
- 2) When this function is required in the Plans, shall provide a contact closure interface to a traffic controller or other device, this interface shall accept eight (8) contact closure inputs (usually red and green control signals) and provide sixteen (16) contact closure outputs to a traffic signal controller. For a SDLC interface to a NEMA T52 traffic controller, this interface shall display 32 phase colors and emulate up to four (4) bus interface units (BIU).
- 3) Shall include software with the capability to define detectors through interactive graphics by placing lines and/or boxes or polygons defined by a minimum of four points.

- 4) Shall be a tracking based system or a system of detection zones (lines and/or boxes) which may assign logical functions to one detector or a group of detectors to accomplish directionality or classification.
- 5) Shall be capable of programming the expected flow direction of traffic to facilitate alarm generation for vehicles traveling in the wrong direction.
- 6) Shall be capable of operating as a stand-alone unit when communication to the central system is lost, calculating traffic parameters in real-time and storing data in its own non-volatile memory.
- 7) Shall be capable of compensating for camera movement attributable to temperature effects, wind shifts, pole sway, pole expansion, or vibration of the mount when attached to bridges, sign structures or other structures.
- 8) Shall allow for detection zone calibration for accommodating perspective variations due to varying camera heights and angles.
- 9) Shall provide for day and night operation.
- 10) Shall provide for communications interface to the video detection system processor through a cabinet-mounted interface panel that terminates the power/communications conductors to the processor and provides the Ethernet interface to the processor.

907-649.02.1.4--Detection Configurations. The VDS shall be programmable for the following detector configurations; at a minimum they shall perform the following functions:

- 1) Count Detector
- 2) Presence Detector
- 3) Speed Detector
- 4) Station Detector
- 5) Speed Alarm
- 6) Lane Detector
- 7) Tunnel Detector

The Speed Detector shall report vehicle speed and vehicle classification based on five user-defined length categories, satisfying the four generalized category requirement recommended by FUWA.

907-649.02.1.5--VDS Software Requirements. The VDS sensor shall store cumulative traffic statistics, internally in non-volatile memory, for later retrieval and analysis. The VDS sensor shall have at least 5 Mb of memory for data storage. Data collection shall not require additional modules or extra software.

The real-time traffic data and color video shall be viewable through a standard web browser using a data collection and management service (DCMS). The DCMS license will be for a twenty-four month period and start from the date of acceptance of the Final Inspection. The manufacturer shall display the data and streaming video real-time on a custom web-site which can be linked to MDOT's internal web-sites, MSTraffic.com & GoMDOT.com. The DCMS

provider must guarantee 95% uptime. All collected data (except video) shall be archived once a month and two electronic copies sent to MDOT. MDOT requires the ability to create and print

custom data reports in Excel or HTML by accessing the manufacturer website and filtering data using reporting parameters. In addition, MDOT requires the capability of having all "raw" data sent directly to an MDOT owned data collection server.

The VDS shall have the capability of polling any and all video detector sensors through communication interfaces, including but not limited to, fiber, wireless, leased broad-band, and leased point to point Ti.

The DCMS Server shall be able to generate the following detail:

- 1) Microsoft Excel, SQL, XML, Jscript database technology
- 2) Microsoft .NET Framework, including support for ASP.NET
- 3) Custom, automated reports, alarms, ftp, and e-mail services.
- 4) Report Manager Graphic User interface (GUI) to customize data distribution and reporting.

907-649.02.1.6--Detection Requirements. Unless otherwise shown in the Plans, the Video Detection System shall detect vehicle passage and presence when the VDS camera assembly is mounted 40 feet or higher above the roadway, when the camera is located adjacent to or over the desired coverage area, and when the distance to the farthest detection zone locations are not greater than ten (10) times the mounting height of the camera.

Optimum accuracy shall be achieved when the length of the detection area or field of view is not greater than four (4) times the mounting height of the image sensor.

The camera shall not be required to be directly over the roadway to achieve minimum accuracy requirements.

The video detection system shall be able to use a single camera to view either approaching and/or receding traffic in the same field of view.

907-649.02.1.7--Accuracy Requirements and Measurement Methods. The accuracy will be measured under normal weather conditions (i.e., not during rain, snow, fog etc.) when the VDS sensor camera is mounted 40 feet or higher, or as otherwise shown in the Plans, above the travel lanes, when the image sensor is adjacent to desired coverage areas, and when the distance to the farthest detection zone is less than four (4) times the mounting height measured in a straight line along the center axis of the field of view.

The Video Detection System shall provide a level of accuracy of less than 5% error rate based on volume counts for the entire field of view compiled over multiple time intervals that contain a minimum of 300 vehicles.

Volume - The volume (count) of vehicles in each lane collected by the video detection system must be within five percent ($\pm 5\%$) of the manually counted volume for that lane. Provide these levels of accuracy during both day and night conditions. A minimum of three hundred (300) vehicles must be used as a sample size for the entire field of view for volume counting accuracy checking.

Vehicle Classification - The vehicle classification feature must classify at least eighty percent (80%) of the vehicles correctly by classifying vehicles into one of four bins (FHWA categories) by vehicle length. This feature will be tested by manually classifying vehicles into cars, light trucks or tractor trailer or larger trucks using an observer (who does the classification) and video tape using the same samples as collected for the volume test. The manually collected classification data will be compared to the data collected by the system for each lane and the percent error will be calculated for the entire field of view.

Stopped Vehicle Detection - The vehicle detection system shall be capable of detecting 95% of all vehicles stopped on the shoulders or in lanes and triggering an alarm. Because of the possible dangers to motorists and workers during this test, the test will be completed after operation has been enabled. A vehicle will be sent to the location and stopped on a shoulder in an active detection zone. An inspector or TMC operator will observe to verify the detection of the stopped vehicle. This test will be performed on all of the video detection system installations up to five, or on a random sample of five if the total number of video detection system installations is greater than this. If all parameters are met for all locations tested, all that are installed on the project will be considered acceptable. If one or more locations fail, a second set of five locations will be examined. If a failure in the second set is recorded, the Contractor will be required to take remedial action until a pass of five locations is achieved.

Speed - The system shall provide an average vehicle speed measurement within ten percent ($\pm 10\%$) of actual speeds. Provide these levels of accuracies for traffic traveling between 20 and 75 mph. Provide these levels of accuracy during both day and night conditions. Personnel participating in and observing these tests will use either radar detectors or probe vehicles to conduct this accuracy demonstration. This test will be performed after the system is in operation as described in the stopped vehicle tests. Failure to achieve accuracy will require remedial/corrective action by the Contractor and repeated testing until accuracy is achieved.

Other Parameters (Occupancy, Flow Rate, Headway, Density) - If the measurements of speed and volume as described above fall within acceptable specified limits of accuracy, and the system is demonstrated to be able to provide the calculated values for these parameters, no further testing will be required. The formulas/algorithms used for the calculations by the system will be provided to the MDOT State Traffic Engineer as part of the documentation of the system.

907-649.02.1.8--Video Camera Sensor. The video camera sensor shall be compatible with the Video Detection System processor and as a minimum meet the following requirements:

- 1) Lens: The video camera sensor will be equipped with a 1 6X to 22X motor driven variable focal length zoom lens.
- 2) Image Sensor: Minimum resolution of 470H X 350V TV lines.
- 3) The Sensor's picture element shall be 768H pixels X 494V pixels or greater.
- 4) Input power: 115 VAC $\pm 15\%$, 60 Hz $\pm 10\%$ single phase power. Any required power conversion shall be contained within the VDS, the chassis, or facilitated by a power adapter provided.
- 5) Electromagnetic interference (EMI): The video camera sensor and associated connected

- equipment will comply with FCC Part 15, Subpart J, Class A device requirements.
- 6) Video camera sensor enclosure: The video camera sensor shall be installed in a black colored enclosure⁷
 - a. The enclosure shall meet NEMA 250 Type 4 enclosure standards and shall be available un-pressurized or optionally pressurized types.
 - b. If the enclosure is pressurized, it shall be pressurized to at least 5 psi \pm 1 psi and a low pressure sensor with an alarm output to the Video Detection System processor and cabinet assembly will be provided.
 - c. Provide a sun shield visor on the front of the enclosure, which is sufficiently adjustable to divert water away from the video camera sensor lens and also to prevent direct sunlight from entering the iris when mounted in its installed position.
 - d. Install the sun shield so that it does not impede operation or performance accuracy of the video camera sensor or require removal of the video camera sensor enclosure for adjustment.
 - e. Use an enclosure that allows the video camera sensor horizon to be rotated in the field during installation.
 - 7) Weight: The standard video camera sensor will not weigh more than 10 lbs., including the mount, shield and camera. If a pressurized video camera sensor and housing is used, the unit including a standard mount, shield and camera will not weigh more than 13 lbs.
 - 8) Mounting: The video camera sensor assembly mounting and hardware shall be included as part of the system.
 - a. The video camera sensor horizon shall be adjustable without removing the camera, mounting bracket and enclosure, or sun shield.
 - b. The video camera sensor assembly shall be capable of sustained wind loading of 90 mph with a 30% gust factor.
 - 9) The video camera sensor assembly shall include all cabling, fasteners, conduit, connectors, etc., to provide power and connectivity to the VDS cabinet equipment for a fully functional system.

907-649.02.1.9--Video Detection System Processor. The Video Detection System processor shall meet the following requirements:

- 1) Shall be contained/integrated in the VDS sensor enclosure.
- 2) Shall process and make available for transmission (upload) to the TMC data stored in operator selectable time periods of 10, 20, or 30 seconds and 1, 5, 10, 15, 30, or 60 minutes (default setup by Contractor shall be 1 minute).
- 3) Shall be password protected to prohibit unauthorized changes, if enabled by user. A minimum of ten (10) different users may be authorized with different levels of authority.
- 4) Observation of detection operation only, without ability to edit configurations, may be allowed with no password. The VDS shall record time and date of each password usage.
- 5) Shall provide the data and MPEG-4 encoded video through a communications interface device via an Ethernet version 2.0 IEEE 802.3 compliant 10/100 Base-T Auto Sensing port in real-time.
- 6) The processor shall be IP-addressable using the user datagram protocol/IP or UDP/IP

- message packet and routing standard.
- 7) A communications address shall be automatically assignable or manually configured to the unit during setup.
 - 8) Upon receiving a command with the appropriate address from the TMC central computer, the unit shall respond with the accumulated traffic parameter measurements from the period since the last request.
 - 9) Shall operate reliably in a typical roadway aerial mounting and under the following conditions:
 - a. Shall have an operating ambient temperature range: -29°F to 140°F (-2034°C to 60°C)
 - b. Shall have an operating humidity tolerance of: 5% — 95% humidity per NEMA TS 1-1989 (R 1994).
 - c. Vibration: Provide a video camera sensor and enclosure that maintains its functional capability and physical integrity when subjected to a vibration of 5 to 30 Hz up to 0.5 gravity applied to each of three mutually perpendicular axes (NEMA TS 1-1989 (R 1994)).
 - d. Shock: Ensure the video camera sensor and enclosure can withstand a minimum 9G shock. Neither permanent physical deformation nor inoperability of the video camera sensor and enclosure shall be sustained from this shock level.
 - e. Acoustic Noise: Provide a video camera sensor and enclosure that can withstand a 150 dB for 30 minutes continuously, with no reduction in function or accuracy.
 - 10) Shall be capable of storing data for an extended period of time.
 - a. All traffic parameter data shall be stored in non-volatile memory within the video detection system processor.
 - b. All traffic parameter data shall be capable of being retrieved using the central computer and by means of an automatic polling client application.
 - c. Upon loss of communications, the system shall automatically store no less than seven (7) days of data in 30 second increments based on the default set-up required. At a minimum, data storage requirements apply to volume, speed and occupancy requirements.
 - 11) Shall be powered by input power: 115 VAC $\pm 15\%$, 60 Hz $\pm 10\%$ single phase power. Any required power conversion shall be contained within the VDS, the chassis, or facilitated by a power adapter provided Total power for a single video camera sensor and the processor shall not exceed 15 watts with the camera heater in operation.
 - 12) Shall have transient protection that meets the requirements of NEMA TS 1-1989 (R 1994) and NEMA T52-1992 standards.
 - 13) Shall recover from power interruptions. Momentary interruptions in power to the processor shall not result in loss of function upon restoration of power.
 - 14) In the event of an interruption of power, the equipment shall automatically recover when power is restored. All detection zones, stations, and parameters shall be returned to their last configurations.
 - 15) Each VDS location shall be capable of simultaneously processing data and images from four separate video camera sensor installations for detection and analysis.
 - 16) The system shall be capable of detecting objects in EIA- 170 (monochrome) and NTSC (color), or CCIR (monochrome) and PAL (color) video signals.
 - 17) Shall allow still image capture (snapshot) from any of the video detection system

processor's active video inputs and provide for downloading the image to the central computer for display or storage as a picture file; capture and transmit the still image to the central computer in one minute or less.

907-649.02.2--Materials Type 2 Vehicle Detection System.

The Type 2 video detection system shall consist of power supply, video cameras, all necessary video and power cabling with end connectors, mounting brackets, lightning protection as recommended by the manufacturer, video detection processors/extension modules capable of processing the number of camera and phase combination video sources shown on the project plans or in the purchase order. Provide sufficient number of cameras to process vehicle presence, passage and system detection zones as shown on the project plans or listed on the purchase order.

907-649.02.2.1--Functional Requirements for Type 2 Vehicle Detection System. The video detection system configuration shall utilize video processors with one or more video inputs and one video output, responding to specific site applications, camera locations and detection zones shown on the project plans. Video processors or interface modules shall be provided which plug directly into TS-1 and TS-2 detector racks without adapters. Extension modules which allow detection zones from one camera to be routed to other card slots shall also be provided. Remote programming and monitoring capability from a distant Traffic Management Center shall be mandatory. The system shall be Ethernet compatible with an RJ4S port.

907-649.02.2.2--Interface Type 2 Video Detection System. The Contractor shall provide the following:

- 1) video inputs that accept RS 170 (NTSC) signals from an external video source. A BNC type interface connector shall be provided and located on the front of the video processing unit.
- 2) a LED indicator to indicate the presence of the video signal. The LED shall illuminate upon valid video synchronization and turn off when the presence of a valid video signal is removed.
- 3) one video output per processor module. The video output shall be RS 170 compliant and shall pass through the input video signal. The video output shall have the capability to show text and graphical overlays to aid in system setup. The overlays shall display real-time actuation of detection zones upon vehicle detection or presence. Control of the overlays and video switching shall also be provided through the serial communications port. The video output interface connector shall be BNC or RCA type. If RCA connector is used, an RCA to BNC adapter shall be provided.
- 4) a serial communications port on the front panel. The serial port shall be compliant with RS-232 or RS-422 electrical interfaces and shall use a DB9 or RJ4S type connector. The serial communications interface shall allow the user to remotely configure the system and/or to extract calculated vehicle/roadway information.
- 5) interface software. The interface protocol shall support multi-drop or point-to-multipoint communications. Each video detection system shall have the capability to be individually IP addressable either built in or with third party video server units.

- 6) open collector contact closure outputs meeting NEMA T52 requirements. The open collector output will be used for vehicle detection indicators as well as discrete outputs for alarm conditions.
- 7) LED status indicators on the front panel. The LED's shall illuminate when a contact closure output occurs. Provide one output LED for each contact closure output.
- 8) a mouse compatible port (PS-2 or USB) on the front panel of the video processing unit. The mouse port shall be used as part of the system setup and configuration. A compatible mouse shall be provided with each video detection system.

907-649.02.2.3--Functionality. Detection zones shall be programmed via an on-board menu displayed on a video monitor and a pointing device connected to the video detection processor. The menu shall facilitate placement of detection zones and setting of zone parameters or to view system parameters. The video detection processor shall detect vehicles in real time as they travel across each detection zone. The video detection processor shall have an RS-232 (DB9 or RJ4S) port for communications with an external computer. The video detection processor port shall be multi-drop capable.

It shall be possible to upload and save all configuration data including loop placement and save the file on a computer. It shall be possible to download a configuration file from a computer to the detection device.

The video detection processor shall accept new detection patterns from an external computer through the RS-232 port when the external computer uses the correct communications protocol for downloading detection patterns.

A WindowsTM based software designed for local and remote connection shall be provided for video capture, real-time detection indication and detection zone modification capability.

The video detection processor shall send its detection patterns to an external computer through the RS-232 port.

The video detection processor shall default to a safe condition, such as minimum recall, fixed recall or a constant call on each active detection channel, in the event of unacceptable interference with the video signal, low visibility conditions, or power failure.

A user-selected output shall be active during the low-visibility condition that can be used to modify the controller operation if connected to the appropriate controller input modifier(s). The system shall automatically revert to normal detection mode when the low-visibility condition no longer exists.

907-649.02.2.4--Vehicle Detection. A minimum of 24 detection zones per camera input shall be possible, and each detection zone shall be capable of being sized to suit the site and the desired vehicle detection area.

A single detection zone shall be able to replace multiple inductive loops and the detection zones shall be OR'ed as the default or may be ANDed together to indicate vehicle presence on a single

phase of traffic movement.

Placement of detection zones shall be done by using only a pointing device, and a graphical interface built into the video detection processor and displayed on a video monitor, to draw the detection zones on the video image from each video camera. Detection zones created in this manner shall be compatible with the PC-based software provided with the system.

The video detection processor's memory shall be non-volatile to prevent data loss during power outages.

When a vehicle is detected crossing a detection zone, the corners or entire zone of the detection zone shall flash/change color on the video overlay display to confirm the detection of the vehicle. It shall be possible to record the operation of the unit in real time with the detection zones operating.

Detection shall be at least 98% accurate in all weather conditions, with slight degradation acceptable under adverse weather conditions (e.g. rain, snow, or fog) which reduce visibility.

The video detection processor shall maintain normal operation of existing detection zones when one zone is being added or modified.

The video detection processor shall output a constant call on any detector channel corresponding to a zone being modified and shall resume normal operation upon completion.

Detection zones shall be directional to reduce false detections from objects traveling in directions other than the desired direction of travel in the detection area.

The video detection processor shall process the video input from each camera using a microprocessor at 30 frames per second at one volt peak to peak 75 ohms or EIA 170 NTSC video standard.

The video detection processor shall output minimum recall, fixed recall or constant call for each enabled detector output channel if a loss of video signal occurs. The recall behavior shall be user selectable for each output. The video detection processor shall output a constant call during the background "learning" period.

Detection zone outputs shall be configurable to allow the selection of presence, pulse, extend, and delay outputs. Timing parameters of pulse extend, and delay outputs shall be user definable between 0.1 to 25.0 seconds in increments of 0.1 seconds.

Up to six detection zones per camera view shall have the capability to count the number of vehicles detected, measure classification and speed. The data values shall be internally stored within the processor module for later retrieval through the RS-232 port. The data collection interval shall be user definable in periods of 5, 15, 30, or 60 minutes or by intersection cycle. Real-time data shall be retrieved from the PC-based software provided with the system.

907-649.02.2.5--Camera. Cameras shall be completely compatible with the video detection processor and shall be certified by the manufacturer to ensure proper system operation.

The detection system shall produce accurate detector outputs under all roadway lighting conditions, regardless of time of day. The minimum range of scene luminance over which the camera shall produce a useable video image shall be the minimum range from nighttime to daytime, but not less than the range 0.009 to 930 foot-candles (0.1 lux to 10,000 lux).

The camera shall use a color CCD sensing element with resolution of not less than 470 lines horizontal and 400 lines vertical.

The camera shall include mechanisms to compensate for changing of lighting by using an electronic shutter and/or auto-iris lens.

The camera shall include a variable focal length lens with factory preset focus that requires no field adjustment. Zooming of the camera lens to suit the site geometry by means of a portable interface device designed for that purpose. The horizontal field of view shall be adjustable from 8.1 to 44.3 degrees. Camera configuration shall be customized for each approach based on field site conditions and the project plans.

The camera electronics shall include automatic gain control (AGC) to produce a satisfactory image at night.

The camera shall be housed in a weather-tight sealed enclosure. The housing shall be field rotatable to allow proper alignment between the camera and the traveled road surface.

The camera enclosure shall be equipped with a sunshield. The sunshield shall include a provision for water diversion to prevent water from flowing in the camera's field of view.

The camera enclosure shall include a thermostatically controlled heater to assure proper operation of the lens shutter at low temperatures and prevent moisture condensation on the optical faceplate of the enclosure. The heater shall directly heat the glass lens and require less than 5 watts over the temperature range.

Power consumption of the camera shall be 15 watts or less under all conditions.

The camera enclosure shall be equipped with separate, weather-tight connections for power and setup video cables at the rear of the enclosure. These connections shall allow diagnostic testing and viewing of video at the camera while the camera is installed on a mast arm or pole using a lens adjustment module furnished under this bid item.

The video signal output by the camera shall in accordance with NTSC standards.

All necessary mounting brackets shall be mounted to pole shafts, mast arms, or other structures to mount cameras as indicated on the project plans. Mounting brackets shall result in a fixed-position mounting. Mounting Brackets shall be included at no additional cost.

907-649.02.2.6--Video Cable. The cable provided shall be as recommended by the manufacturer for optimal video detection performance. The cable shall be either multi-paired jacketed cable or coaxial cable. Coaxial cable can be used between the camera and the video detection processor in the traffic signal controller cabinet and shall be Belden 8281 or equivalent. The signal attenuation shall not exceed 0.78 dB per 100 feet at 10 MHz. Nominal outside diameter shall be approximately 0.305 inch. Coaxial cable shall be suitable for installation in conduit and in exposed sunlight environment. 75-ohm BNC plug connectors shall be used at both the camera and cabinet ends. The coaxial cable, BNC connector, and crimping tool recommended by the manufacturer of the video detection system shall be used and installed per the manufacturer's recommended instructions to ensure proper connection.

Multi-paired jacketed cable shall include a minimum of four individually paired No. 19 AWG communication cables with an overall shield. Pairs shall not be individually shielded. Paired cable and power cables may be installed under the same outer jacket.

907-649.02.2.7--Power Cable. Power cable for 120VAC cameras shall be rated for 90°C, 300 volt, 16 AWG, stranded, three-conductor cable with a nominal outside diameter of approximately 0.330 inch. Conductor insulation color code shall be black, white and green. Outside jacket shall be black.

Power cable for 24 Volt or other low voltage cameras shall be the cable recommended by the manufacturer.

Camera power cable shall be suitable for installation in conduit and in exposed sunlight environment, and UL listed.

The power and video cable may be installed under the same outer jacket.

907-649.02.2.8--Surge Protection. Surge protection devices shall be provided for all new or added video detection devices as recommended by the manufacturer.

Coaxial cable shall be protected with an inline surge suppressor as recommended by the manufacturer or a panel mounted surge suppressor as recommended by the manufacturer or approved equal, installed and grounded per video detection manufacturer's recommendations.

907-649.02.2.9--Physical and Environmental Specifications.

Video Detection System Processor: The video detection system processor shall operate reliably in a typical roadside traffic cabinet environment. Internal cabinet equipment and a video detection system processor shall be provided that meets the environmental requirements of NEMA T52-2003 Section 2. If the processor is located in the sensor, it shall meet the same requirements.

Video Camera Sensor: The operating ambient temperature range shall be -30°F to 140°F. Additionally, a heater shall be included to prevent the formation of ice and condensation in cold

weather. Do not allow the heater to interfere with the operation of the video camera sensor electronics, or cause interference with the video signal.

Vibration: Vibrations shall meet the requirements of TS-2 2003 section 2.1.9.

Shock: Shock shall meet the requirements of TS-2 2003 section 2.1 .10.

Acoustic Noise: A video camera sensor and enclosure shall be provided that can withstand 150 dB for 30 minutes continuously, with no reduction in function or accuracy.

907-649.03--Construction Requirements. The Construction and testing requirements for Type 1 and Type 2 Video Detection Systems are the same.

907-649.03.1--General Requirements. The Contractor shall:

- 1) Install all video camera sensors, video detection system processors and associated enclosures and equipment at the locations specified in the Plans, in any related notice to bidders, or as directed.
- 2) Install all cabinet-mounted equipment in the intersection equipment cabinet or as specified in the Plans.
- 3) Cabling from video camera sensors shall be provided and installed in accordance with the video detection system manufacturer's recommendations.
- 4) Make all necessary adjustments and modifications to the total VDS prior to requesting inspection for system/device acceptance.
- 5) Mount the camera approximately two (2) feet below the top of the extension pole or separate pole or as shown in the Plans.
- 6) The camera shall be mounted so as to view approaching traffic unless otherwise directed.
- 7) The camera location and zone of detection shall be optimized as directed by the MDOT State Traffic Engineer, or authorized designee.
- 8) Adjust the video camera sensor zoom lens to match the width of the road/detection area, and minimize lane vehicle occlusion.
- 9) Fasten all other cabinet components, with hex-head or Phillips-head machine screws insulated with nuts (with locking washer or insert) or into tapped and threaded holes. Do not use self-tapping or self-threading fasteners.
- 10) Provide electrical cables for video, communications signaling and power supply between the cabinet and the VDS image sensor cameras as recommended by the video detection system manufacturer, and as required for a fully functional VDS.

907-649.03.2--Contractor Training. Installation of the video detection system shall be as recommended by the supplier and performed by a Contractor trained and certified by the supplier. Where time does not reasonably permit training of the installing Contractor, a supplier factory representative shall supervise and assist a Contractor during installation of the video detection system.

907-649.03.3--Test Requirements. The Contractor shall conduct a Project Testing Program as required below. All costs associated with the Project Testing Program shall be included in

overall contract prices; no separate payment will be made for any testing.

907-649.03.3.1--General Requirements. The Contractor is responsible for planning, coordinating, conducting and documenting all aspects of the Project Testing Program. The Project Engineer and/or authorized representatives are only responsible for attending and observing each test, and reviewing and approving the Contractor's test results documentation. The Project Engineer and/or authorized representatives reserve the right to attend and observe all tests.

Each test shall fully demonstrate that the equipment being tested is clearly and definitely in full compliance with all project requirements.

Test procedures shall be submitted and approved for each test as part of the project submittals. Test procedures shall include every action necessary to fully demonstrate that the equipment being tested is clearly and definitely in full compliance with all project requirements. Test procedures shall cross-reference to these Technical Specifications or the Project Plans. Test procedures shall contain documentation regarding the equipment configurations and programming.

No testing shall be scheduled until approval of all project submittals and approval of the test procedures for the given test.

The Contractor shall provide all ancillary equipment and materials as required in the approved test procedures.

The Contractor shall request in writing the Project Engineer's approval for each test occurrence a minimum of 14 days prior to the requested test date. Test requests shall include the test to be performed and the equipment to be tested. The Project Engineer reserves the right to reschedule test request if needed.

All tests shall be documented in writing by the Contractor in accordance with the test procedure and submitted to the Project Engineer within seven (7) days of the test. Any given test session is considered incomplete until the Project Engineer has approved the documentation for that test session.

All tests deemed by the Project Engineer to be unsatisfactorily completed shall be repeated by the Contractor. In the written request for each test occurrence that is a repeat of a previous test, the Contractor shall summarize the diagnosis and correction of each aspect of the previous test, that was deemed unsatisfactory. The test procedures for a repeated test occurrence shall meet all the requirements of the original test procedures, including review and approval by the Project Engineer and ITS Manager.

The satisfactory completion of any test shall not relieve the Contractor of responsibility to provide a completely acceptable and operating system that meets all requirements of this project.

907-649.03.3.2--Factory Acceptance Test (FAT). Factory Acceptance Tests shall be conducted

at the Manufacturer or Contractor facility or at a facility acceptable to all parties. All equipment to be utilized for this project shall be subject to tests that demonstrate the suitability of the design and compliance with the contract requirements, unless an exception for an equipment item is granted by the Project Engineer. The tests shall be performed on production units identified to be delivered under this contract.

The FAT procedure shall demonstrate all requirements defined in these specifications are met, including, but not limited to: functional/system performance requirements, electrical requirements, data transmission/communication requirements, safety/password requirements, environmental requirements, and interface requirements with other components of the project system.

The Project Engineer reserves the right to waive FATs which are deemed to be unnecessary and reserves the right to witness all FATs that are determined to be critical to the project. At a minimum, the Project Engineer and/or authorized representative will be in attendance at the FAT for the first three (3) units tested. The FAT for the first three (3) units shall be conducted during the same period. The Project Engineer shall be notified a minimum of forty-five (45) calendar days in advance of such tests. Salary and travel expenses of the Project Engineer and authorized representatives will be the responsibility of MDOT. In case of equipment or other failures that make a retest necessary, travel expenses of the Project Engineer and authorized representatives shall be the responsibility of the Contractor. These costs shall be deducted from payment due the Contractor.

The vendor must complete the FAT on all remaining units on their own and submit documentation to the Project Engineer that the FATs were completed. The Project Engineer reserves the right to randomly attend those FAT tests.

No equipment for which a FAT is required shall be shipped to the project site without successful completion of factory acceptance testing as approved by the Project Engineer and the Engineer's approval to ship.

907-649.03.3.3--Standalone Acceptance Test (SAT). The Contractor shall perform a complete SAT on all equipment and materials associated with the field device site, including but not limited to electrical service, conduit, pull boxes, communication links (fiber, leased copper, wireless), control cables, poles, etc. A SAT shall be conducted at every field device site. Where applicable, a SAT shall be conducted for a fully installed and completed connection to the designated Traffic Management Center (TMC) or central data/video collection site.

The SAT shall demonstrate that all equipment and materials are in full compliance with all project requirements and fully functional as installed and in final configuration. The SAT shall also demonstrate full compliance with all operational and performance requirements of the project. All SATs will include a visual inspection of the cabinet and all construction elements at the site to ensure they are compliant with the specifications.

All SATs will include videos of the approach with detection zones overlaid showing detector activations.

- 1) One hour videos shall be made of each approach and compared to actual detection calls.
- 2) Thirty minute videos shall be made starting 15 minutes prior to sunrise and sunset for each approach and compared to actual detection calls.
- 3) All videos shall be date and time stamped.
- 4) Provide all videos to the Engineer with a summary of the results included total calls, missed calls and false calls.
- 5) All test results must meet a 98% accuracy requirement.

After a sixty (60) day burn-in period, the Contractor must demonstrate the accuracy requirements specified in Subsection 907-649.02.1.7 at selected intersections. The intersections to be tested will be randomly selected by the Project Engineer.

907-649.03.4--Warranty. The video detection system shall be warranted to be free of manufacturer defects in materials and workmanship for a period of one year from the date of final acceptance. Equipment covered by the manufacturer's warranties shall have the registration of that component placed in MDOT's name prior to final inspection. The Contractor is responsible for ensuring that the vendors and/or manufacturers supplying the components and providing the equipment warranties recognize MDOT as the original purchaser and owner/end user of the components from new. During the warranty period, the supplier shall repair or replace with new or refurbished material, at no additional cost to the State, any product containing a warranty defect, provided the product is returned postage-paid by the Department to the supplier's factory or authorized warranty site. Products repaired or replaced under warranty by the supplier shall be returned prepaid by the supplier.

During the warranty period, technical support shall be available from the supplier via telephone within four hours of the time a call is made by the Department, and this support shall be available from factory certified personnel. During the warranty period, updates and corrections to control unit software shall be made available to the Department by the supplier at no additional cost.

907-649.03.5--MDOT Employee Training. The Contractor shall submit to the Project Engineer for approval a detailed Training Plan including course agendas, detailed description of functions to be demonstrated and a schedule. The Contractor must also submit the Trainer's qualifications to the Project Engineer for approval prior to scheduling any training. The training must include both classroom style training and hands-on training in the field of the maintenance and troubleshooting procedures required for each component. The training should also consist of a hands-on demonstration of all software configuration and functionality where applicable.

The supplier of the video detection system shall, at a minimum, provide a sixteen-hour operations and maintenance training class with suitable documentation for up to eight (8) persons selected by the Department. The operations and maintenance class shall be scheduled at a mutually acceptable time and location.

907-649.03.6--Maintenance and Technical Support. The supplier shall maintain an adequate inventory of parts to support maintenance and repair of the video detection system. Spare parts

shall be available for delivery within 30 days of placement of an acceptable order at the supplier's then current pricing and terms of sale of said spare parts.

The suppliers shall maintain an ongoing program of technical support for the video detection system. This technical support shall be available via telephone or via personnel sent to the installation site upon placement of an acceptable order at the supplier's then current pricing and terms of sale of said technical support services.

907-649.04--Method of Measurement. Video Detection System, and Video Detection-Data Collection & Management License will be measured as a unit per each.

Video Detection Training will be measured per lump sum after the completion of all training.

907-649.05--Basis of Payment. Video Detection System, and Video Detection-Data Collection & Management License, measured as prescribed above, will be paid for at the contract price per each, which price shall include installation, system integration, documentation, and testing of a complete video detection system site including video camera sensor/processor, the sensor environmental enclosure, all cables between cameras and the cabinet, attachment hardware and brackets, completion of all testing requirements and all work, equipment and appurtenances as required to provide and install a complete video detection system. The price bid shall also include all system documentation including: shop drawings, operations and maintenance manuals, wiring diagrams, block diagrams and other materials necessary to document the operation of the video detection system. This price shall be full compensation for all labor, tools, materials, equipment and incidentals necessary to complete the work.

Video Detection Training, measured as prescribed above, will be paid for at the contract lump sum price, which price shall be full compensation for all training costs.

Payment will be made under:

- 907-649-A: Video Detection System, Type ___ - per each
- 907-649-B: Video Detection-Data Collection & Management License - per each
- 907-649-C: Video Detection Training - lump sum

Construction necessary to widen, add turn lanes and overlay US 90 from SR 57 to West Pascagoula River Bridge, known as Federal Aid Project No. STP-0003-01(086) / 103803301, in the County of Jackson, State of Mississippi.

I (We) agree to complete the entire project within the specified contract time.

***** SPECIAL NOTICE TO BIDDERS *****

**BIDS WILL NOT BE CONSIDERED UNLESS BOTH UNIT PRICES AND ITEM TOTALS ARE ENTERED.
 BIDS WILL NOT BE CONSIDERED UNLESS THE BID CERTIFICATION LOCATED AT THE END OF THE BID SHEETS IS SIGNED**

*****BID SCHEDULE*****

Line No.	Item Code	Adj Code	Quantity	Units	Description	Unit Price		Item Amount	
						Dollar	Ct	Dollar	Ct
Roadway Items									
0010	201-A001 Changed 06/16/2009		1	Lump Sum	Clearing and Grubbing	XXXXXXXX	XXX		
0020	202-B017		5,718	Linear Feet	Removal of Concrete Combination Curb & Gutter				
0030	202-B024		1,115	Square Yard	Removal of Concrete Median & Island Pavement, All Depths				
0040	202-B057		4	Each	Removal of Inlets, All Sizes				
0050	202-B070		1	Each	Removal of Sign Including Post & Footing				
0060	202-B078		15,131	Square Yard	Removal of Pavement, All Types and Depths				
0070	202-B106		3,204	Linear Feet	Removal of Pipe, All Sizes				
0080	202-B155		6	Each	Removal of Box Culvert Wings and Headwall, All Sizes				

Line No.	Item Code	Adj Code	Quantity	Units	Description	Unit Price		Bid Amount	
0090	202-B174		280	Linear Feet	Removal of Debris and Sand From Box Culvert, Less Than 6-foot Width				
0100	202-B176		330	Linear Feet	Removal of Debris and Sand From Pipe, 18" to Less Than 36" Diameter				
0110	203-A004 Changed 06/16/2009	(E)	19,425	Cubic Yard	Unclassified Excavation, LVM, AH				
0120	203-EX039 Changed 06/16/2009	(E)	2,532	Cubic Yard	Borrow Excavation, AH, LVM, Class B7-6				
0130	203-G004 Changed 06/16/2009	(E)	8,750	Cubic Yard	Excess Excavation, LVM, AH				
0140	206-A001	(S)	507	Cubic Yard	Structure Excavation				
0150	206-B001	(E)	34	Cubic Yard	Select Material for Undercuts, Contractor Furnished, FM				
0160	209-A004		35,115	Square Yard	Geotextile Stabilization, Type V, Non-Woven				
0170	220-A001		9	Acre	Insect Pest Control	30.	00	270.	00
0180	234-A001		2,763	Linear Feet	Temporary Silt Fence				
0190	235-A001		593	Bale	Temporary Erosion Checks				
0200	406-A001		171,736	Square Yard	Cold Milling of Bituminous Pavement, All Depths				

Line No.	Item Code	Adj Code	Quantity	Units	Description	Unit Price		Bid Amount	
0210	423-A001		15	Mile	Rumble Strips, Ground In				
0220	602-A001	(S)	19,120	Pounds	Reinforcing Steel				
0230	603-CA088	(S)	2,072	Linear Feet	18" Reinforced Concrete Pipe, Class III, Rubber Type Gaskets				
0240	603-CA089	(S)	1,828	Linear Feet	24" Reinforced Concrete Pipe, Class III, Rubber Type Gaskets				
0250	603-CA090	(S)	92	Linear Feet	30" Reinforced Concrete Pipe, Class III, Rubber Type Gaskets				
0260	603-CA091	(S)	392	Linear Feet	36" Reinforced Concrete Pipe, Class III, Rubber Type Gaskets				
0270	603-CB001	(S)	49	Each	18" Reinforced Concrete End Section				
0280	603-CB002	(S)	17	Each	24" Reinforced Concrete End Section				
0290	603-CB003	(S)	6	Each	30" Reinforced Concrete End Section				
0300	603-CE042	(S)	248	Linear Feet	44" x 27" Concrete Arch Pipe, Class A III, Flexible Plastic Gaskets				
0310	603-CE045	(S)	184	Linear Feet	36" x 23" Concrete Arch Pipe, Class A III, Flexible Plastic Gaskets				
0320	603-CF003	(S)	3	Each	36" x 23" Concrete Arch Pipe End Section				

Line No.	Item Code	Adj Code	Quantity	Units	Description	Unit Price		Bid Amount	
0330	603-CF004	(S)	1	Each	44" x 27" Concrete Arch Pipe End Section				
0340	604-A001		3,239	Pounds	Castings				
0350	604-B001		889	Pounds	Gratings				
0360	608-A001	(S)	215	Square Yard	Concrete Sidewalk, Without Reinforcement				
0370	609-D002	(S)	1,404	Linear Feet	Combination Concrete Curb and Gutter Type 2				
0380	609-D008	(S)	7,722	Linear Feet	Combination Concrete Curb and Gutter Type 3A				
0390	609-D009	(S)	8,683	Linear Feet	Combination Concrete Curb and Gutter Type 3B				
0400	614-A002	(S)	4,093	Square Yard	Concrete Driveway, Without Reinforcement, 6-inch Thickness				
0410	616-A001	(S)	50	Square Yard	Concrete Median and/or Island Pavement, 4-inch				
0420	616-A003	(S)	12	Square Yard	Concrete Median and/or Island Pavement, 10-inch				
0430	618-A001		1	Lump Sum	Maintenance of Traffic	XXXXXXXXX	XXX		
0440	619-A1002		39	Mile	Temporary Traffic Stripe, Continuous White				

Line No.	Item Code	Adj Code	Quantity	Units	Description	Unit Price		Bid Amount	
0450	619-A2002		19	Mile	Temporary Traffic Stripe, Continuous Yellow				
0460	619-A3006		19	Mile	Temporary Traffic Stripe, Skip White				
0470	619-A5001		45,680	Linear Feet	Temporary Traffic Stripe, Detail				
0480	619-A6001		3,728	Linear Feet	Temporary Traffic Stripe, Legend				
0490	619-A6002		2,776	Square Feet	Temporary Traffic Stripe, Legend				
0500	619-C6001		1,374	Each	Red-Clear Reflective High Performance Raised Marker				
0510	619-D3001		5	Each	Remove and Reset Signs, All Sizes				
0520	619-D4001		116	Square Feet	Directional Signs				
0530	619-F1005		6,336	Linear Feet	Portable Median Barrier, Less Than or Equal to 45 MPH				
0540	619-F2002		13,200	Linear Feet	Remove and Reset Portable Median Barrier				
0550	620-A001		1	Lump Sum	Mobilization	XXXXXXXXXX	XXX		
0560	627-K001		1,765	Each	Red-Clear Reflective High Performance Raised Markers				

Line No.	Item Code	Adj Code	Quantity	Units	Description	Unit Price		Bid Amount	
0570	630-A001		239	Square Feet	Standard Roadside Signs, Sheet Aluminum, 0.080" Thickness				
0580	630-A002		143	Square Feet	Standard Roadside Signs, Sheet Aluminum, 0.125" Thickness				
0590	630-C003		597	Linear Feet	Steel U-Section Posts, 3.0 lb/ft				
0600	630-E004		137	Pounds	Structural Steel Angles & Bars, 7/16" x 2 1/2" Flat Bar				
0610	630-K002		85	Linear Feet	Welded & Seamless Steel Pipe Posts, 3 1/2"				
0620	630-K003		62	Linear Feet	Welded & Seamless Steel Pipe Posts, 4"				
0630	631-A001		30	Cubic Yard	Flowable Fill				
0631	635-A001 Added 06/16/2009		3,577	Linear Feet	Vehicle Loop Assemblies				
0632	636-A002 Added 06/16/2009		19,245	Linear Feet	Shielded Cable				
0633	638-A002 Added 06/16/2009		39	Each	Loop Detector Amplifier, 4 Channel				
0640	640-A016		57	Each	Traffic Signal Heads, Type 1 LED				
0650	640-A018		6	Each	Traffic Signal Heads, Type 3 LED				

Line No.	Item Code	Adj Code	Quantity	Units	Description	Unit Price		Bid Amount	
0660	640-A019		21	Each	Traffic Signal Heads, Type 5 LED				
0670	640-A034		20	Each	Traffic Signal Heads, Type 6 LED Countdown				
0680	642-A008		7	Each	Solid State Traffic Actuated Controllers, Type 8A				
0690	643-A001		1	Each	Closed Loop On-Street Master System				
0700	644-A001		28	Each	Optical Detector				
0710	644-B001		6,660	Linear Feet	Optical Detector Cable				
0720	644-C002		7	Each	Phase Selector, 4 Channel				
0730	646-A001		1	Lump Sum	Removal of Existing Traffic Signal Equipment	XXXXXXXX	XXX		
0740	647-A003		7	Each	Pullbox, Type 4				
0750	647-A005 Changed 06/16/2009		54	Each	Pullbox, Type 2				
0760	648-A001		5	Each	Radio Interconnect, Installed in New Controller Cabinet				
0770	666-B015		3,700	Linear Feet	Electric Cable, Underground in Conduit, IMSA 20-1, AWG 14, 5 Conductor				

Line No.	Item Code	Adj Code	Quantity	Units	Description	Unit Price		Bid Amount	
0780	666-B016 Changed 06/16/2009		7,000	Linear Feet	Electric Cable, Underground in Conduit, IMSA 20-1, AWG 14, 7 Conductor				
0790	666-B022		355	Linear Feet	Electric Cable, Underground in Conduit, IMSA 20-1, AWG 8, 2 Conductor				
0800	668-A018 Changed 06/16/2009		5,560	Linear Feet	Traffic Signal Conduit, Underground, Type 4, 2"				
0810	668-B024 Changed 06/16/2009		255	Linear Feet	Traffic Signal Conduit, Underground Drilled or Jacked, Rolled Pipe, 2"				
0820	668-B025 Changed 06/16/2009		2,760	Linear Feet	Traffic Signal Conduit, Underground Drilled or Jacked, Rolled Pipe, 3"				
0830	699-A001		1	Lump Sum	Roadway Construction Stakes	XXXXXXXX	XXX		
0840	815-A009	(S)	478	Ton	Loose Riprap, Size 300				
0850	815-E001	(S)	472	Square Yard	Geotextile under Riprap				
0860	907-225-A001		18	Acre	Grassing				
0870	907-225-B001		36	Ton	Agricultural Limestone				
0880	907-237-A001		778	Linear Feet	Wattles				
0890	907-304-F001	(GT)	12,115	Ton	Size 825 Crushed Stone Base				

Line No.	Item Code	Adj Code	Quantity	Units	Description	Unit Price		Bid Amount	
0900	907-403-A001	(BA1)	2,370	Ton	Hot Mix Asphalt, HT, 12.5-mm mixture				
0910	907-403-A002	(BA1)	2,962	Ton	Hot Mix Asphalt, HT, 19-mm mixture				
0920	907-403-A005	(BA1)	861	Ton	Hot Mix Asphalt, HT, 9.5-mm mixture				
0930	907-403-A011	(BA1)	7,360	Ton	Hot Mix Asphalt, ST, 12.5-mm mixture				
0940	907-403-A012	(BA1)	4,675	Ton	Hot Mix Asphalt, ST, 19-mm mixture				
0950	907-403-A015	(BA1)	5,660	Ton	Hot Mix Asphalt, ST, 9.5-mm mixture				
0960	907-403-B003	(BA1)	3,011	Ton	Hot Mix Asphalt, HT, 9.5-mm mixture, Leveling				
0970	907-403-C005	(BA1)	1,384	Ton	Hot Mix Asphalt, ST, 19-mm mixture, Trench Widening				
0980	907-403-D001	(BA1)	30,106	Ton	Hot Mix Asphalt, HT, 12.5-mm mixture, Polymer Modified				
0990	907-403-D004	(BA1)	24,063	Ton	Hot Mix Asphalt, HT, 9.5-mm mixture, Polymer Modified				
1000	907-601-A001	(S)	32	Cubic Yard	Class "B" Structural Concrete				
1010	907-601-B003	(S)	157	Cubic Yard	Class "B" Structural Concrete, Minor Structures				

Line No.	Item Code	Adj Code	Quantity	Units	Description	Unit Price		Bid Amount	
1020	907-603-ALT01	(S)	1,284	Linear Feet	18" Type A Alternate Pipe				
1030	907-603-ALT02	(S)	344	Linear Feet	24" Type A Alternate Pipe				
1040	907-603-ALT03	(S)	68	Linear Feet	30" Type A Alternate Pipe				
1050	907-626-A003		20	Mile	6" Thermoplastic Traffic Stripe, Skip White				
1060	907-626-B004		2	Mile	6" Thermoplastic Traffic Stripe, Continuous White				
1070	907-626-C003		12	Mile	6" Thermoplastic Double Drop Edge Stripe, Continuous White				
1080	907-626-E003		1,494	Linear Feet	6" Thermoplastic Traffic Stripe, Continuous Yellow				
1090	907-626-F003		10	Mile	6" Thermoplastic Double Drop Edge Stripe, Continuous Yellow				
1100	907-626-G004		31,680	Linear Feet	Thermoplastic Detail Stripe, White				
1110	907-626-G005		21,120	Linear Feet	Thermoplastic Detail Stripe, Yellow				
1120	907-626-H004		1,864	Linear Feet	Thermoplastic Legend, White				
1130	907-626-H005		2,776	Square Feet	Thermoplastic Legend, White				

Line No.	Item Code	Adj Code	Quantity	Units	Description	Unit Price		Bid Amount	
1140	907-639-A007		2	Each	Traffic Signal Equipment Pole, Type II, 17' Shaft, 40' Arm				
1150	907-639-A009		1	Each	Traffic Signal Equipment Pole, Type II, 17' Shaft, 60' Arm				
1160	907-639-A011		1	Each	Traffic Signal Equipment Pole, Type II, 17' Shaft, 35' Arm				
1170	907-639-A012		2	Each	Traffic Signal Equipment Pole, Type II, 17' Shaft, 45' Arm				
1180	907-639-A015		4	Each	Traffic Signal Equipment Pole, Type IV, 30' Shaft, 50' Arm				
1190	907-639-A016		3	Each	Traffic Signal Equipment Pole, Type IV, 30' Shaft, 55' Arm				
1200	907-639-A018		2	Each	Traffic Signal Equipment Pole, Type II, 17' Shaft, 65' Arm				
1210	907-639-A019		3	Each	Traffic Signal Equipment Pole, Type II, 17' Shaft, 70' Arm				
1220	907-639-A020		2	Each	Traffic Signal Equipment Pole, Type IV, 30' Shaft, 60' Arm				
1230	907-639-A021		1	Each	Traffic Signal Equipment Pole, Type IV, 30' Shaft, 40' Arm				
1240	907-639-A030		3	Each	Traffic Signal Equipment Pole, Type IV, 30' Shaft, 65' Arm				
1250	907-639-A031		2	Each	Traffic Signal Equipment Pole, Type IV, 30' Shaft, 70' Arm				

Line No.	Item Code	Adj Code	Quantity	Units	Description	Unit Price		Bid Amount	
1260	907-639-A034		4	Each	Traffic Signal Equipment Pole, Type VI, 8' Shaft				
1270	907-639-A049 Deleted 06/16/2009					XXXXXXXXXX	XXX	XXXXXXXXXX	XXX
1280	907-639-A050		1	Each	Traffic Signal Equipment Pole, Type IV, 30' Shaft, 65' & 55' Arms				
1290	907-639-C002		104	Cubic Yard	Pole Foundations, 36" Diameter				
1300	907-639-C003 Changed 06/16/2009		3	Cubic Yard	Pole Foundations, 24" Diameter				
1310	907-639-D001		380	Linear Feet	Slip Casing, 36" Diameter				
1320	907-639-D003 Changed 06/16/2009		20	Linear Feet	Slip Casing, 24" Diameter				
1330	907-649-A001 Changed 06/16/2009		7	Each	Video Detection System, 1 Sensor				
1340	907-651-A002 Deleted 06/16/2009					XXXXXXXXXX	XXX	XXXXXXXXXX	XXX
1350	907-651-B008 Deleted 06/16/2009					XXXXXXXXXX	XXX	XXXXXXXXXX	XXX
1360	907-651-B009 Deleted 06/16/2009					XXXXXXXXXX	XXX	XXXXXXXXXX	XXX
1370	907-651-B010 Deleted 06/16/2009					XXXXXXXXXX	XXX	XXXXXXXXXX	XXX

Line No.	Item Code	Adj Code	Quantity	Units	Description	Unit Price		Bid Amount	
1380	907-651-B011					XXXXXXXX	XXX	XXXXXXXX	XXX
	Deleted 06/16/2009								
1390	907-651-B013					XXXXXXXX	XXX	XXXXXXXX	XXX
	Deleted 06/16/2009								

*** BID CERTIFICATION ***

TOTAL BID.....\$_____

*** DBE/WBE SECTION ***

Complete item nos. 1, 2, and/or 3 as appropriate. See Notice to Bidders addressing Disadvantaged Business Enterprises in Highway Construction.

1. I/We agree that no less than _____ percent shall be expended with small business concerns owned and controlled by socially and economically disadvantaged individuals (DBE and WBE).
2. Classification of Bidder: Small Business (DBE)_____ Small Business (WBE)_____
3. A joint venture with a Small Business (DBE/WBE): _____

*** SIGNATURE STATEMENT ***

BIDDER ACKNOWLEDGES THAT HE/SHE HAS CHECKED ALL ITEMS IN THIS PROPOSAL FOR ACCURACY AND CERTIFIED THAT THE FIGURES SHOWN THEREIN CONSTITUTE THEIR OFFICIAL BID.

BIDDER'S SIGNATURE

BIDDER'S COMPANY

BIDDER'S FEDERAL TAX ID NUMBER