

SUBMIT BIDS TO:	CITY OF TUSCALOOSA P.O. BOX 2089 TUSCALOOSA, AL 35403	PURCHASING OFFICE 2201 UNIV. BLVD. TUSCALOOSA, AL 35401	INVITATION TO BID CITY OF TUSCALOOSA										
BID TITLE TRAFFIC SIGNALS & SUPPLIES (2016)			BID NO. 7003-052516-1										
PAGE 1 OF <u>19</u> PAGES	BIDS WILL BE OPENED AT 2:00 PM ON MAY 25, 2016 IN THE OFFICE OF THE PURCHASING AGENT, 2201 UNIVERSITY BLVD. TUSCALOOSA, AL 35401 AND MAY NOT BE WITHDRAWN FOR THIRTY (30) DAYS AFTER SUCH DATE & TIME.		ISSUE DATE 05/04/2016										
 <p style="text-align: center;">MAYOR WALTER MADDOX</p> <p style="text-align: center;">COUNCIL MEMBERS</p> <table border="0" style="width: 100%;"> <tr> <td>PHYLLIS W. ODOM</td> <td>MATTHEW CALDERONE</td> </tr> <tr> <td>HARRISON TAYLOR</td> <td>KIP TYNER</td> </tr> <tr> <td>CYNTHIA LEE ALMOND</td> <td>EDDIE PUGH</td> </tr> <tr> <td>SONYA MCKINSTRY</td> <td></td> </tr> </table> <table border="0" style="width: 100%;"> <tr> <td>CITY CLERK TONY MEGGS</td> <td>PURCHASING AGENT DAVID COGGINS</td> </tr> </table>		PHYLLIS W. ODOM	MATTHEW CALDERONE	HARRISON TAYLOR	KIP TYNER	CYNTHIA LEE ALMOND	EDDIE PUGH	SONYA MCKINSTRY		CITY CLERK TONY MEGGS	PURCHASING AGENT DAVID COGGINS	Vendor Information (SECTION TO BE COMPLETED BY VENDOR) <hr/> Company Name (Please Print) <hr/> Phone Number Fax Number <hr/> Email Address	
PHYLLIS W. ODOM	MATTHEW CALDERONE												
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GENERAL CONDITIONS OF INVITATIONS TO BID

1. **PREPARATION OF BIDS**
Bids will be prepared in accordance with the following:
 - (a) Our enclosed Bid Proposal Form is to be used in submitting your bid.
 - (b) All information required by the Bid form shall be furnished. The bidder shall print or type his name and manually sign the schedule and each continuation sheet on which any entry is made.
 - (c) Unit prices shall be shown and where there is an error in extension of price, the unit price shall govern.
 - (d) Proposed delivery time must be shown and shall include Sundays and holidays.
 - (e) Bidder will not include federal taxes nor State of Alabama sales, excise, and use taxes in bid prices as the City is exempt from payment of such taxes. An exemption certificate will be signed where applicable upon request.
 - (f) Bidders shall thoroughly examine the drawings, specifications, schedule, instructions and all other contract documents.
 - (g) Bidders shall make all investigations necessary to thoroughly inform themselves regarding plant and facilities for delivery of material and equipment as required by the bid conditions. No plea of ignorance by the bidder of conditions that exist or that may hereafter exist as a result of failure or omission on the part of the bidder to make the necessary examinations and investigations, or failure to fulfill in every detail the requirements of the contract documents, will be accepted as a basis for varying the requirements of the City or the compensation to the vendor.
 - (h) Bidders are advised that all City Contracts are subject to all legal requirements provided for in the Purchasing ordinance and/or State and Federal Statutes.

2. **DESCRIPTION OF SUPPLIES**
 - (a) Any manufacturer's names, trade names, brand name, or catalog numbers used in specifications are for the purpose of describing and establishing general quality levels. SUCH REFERENCES ARE NOT INTENDED TO BE RESTRICTIVE. Bids will be considered for any brand which meets the quality of the specifications listed for any items.
 - (b) Bidders are required to state exactly what they intend to furnish, otherwise they shall be required to furnish the items as specified.
 - (c) Bidders will submit, with their proposal, data necessary to evaluate and determine the quality of the item(s) they are bidding.

3. **SUBMISSION OF BIDS**
 - (a) Bids and changes thereto shall be enclosed in sealed envelopes addressed to David Coggins, Purchasing Agent, 2201 University Blvd., Tuscaloosa, Alabama. The name and address of the bidder, the date and hour of the bid opening and the material or service bid on shall be placed on the outside of the envelope.
 - (b) Bids must be submitted on the forms furnished. Telegraphic bids will not be considered.

4. **REJECTION OF BIDS**
 - (a) The City may reject a bid if:
 1. The bidder misstates or conceals any material fact in the bid, or if,
 2. The bid does not strictly conform to the law or requirement of bid, or if,
 3. The bid is conditional, except that the bidder may qualify his bid for acceptance by the City on an "all or none" basis, or a "low item" basis. An "all or none" basis bid must include all items upon which bids are invited.
 - (b) The City may, however, reject all bids whenever it is deemed in the best interest of the City. The City may also waive any minor informalities or irregularities in any bid.

5. **WITHDRAWAL OF BIDS**
 - (a) Bids may not be withdrawn after the time set for the bid opening for a period of time as specified.
 - (b) Bids may be withdrawn prior to the time set for the bid opening.

6. LATE BIDS OR MODIFICATIONS

- (a) Bids and modifications received after the time set for the bid opening will not be considered.
- (b) Modifications in writing received prior to the time set for the bid opening will be accepted.

7. CLARIFICATIONS OR OBJECTION TO BID SPECIFICATIONS

If any person contemplating submitting a bid for this contract is in doubt as to the true meaning of the specifications or other bid documents of any part thereof, he may submit to the Purchasing Agent on or before five (5) days prior to scheduled opening a request for clarification. All such requests for information shall be made in writing and the person submitting the request will be responsible for its prompt delivery. Any objection to the specifications and requirements as set forth in this bid must be filed in writing with the Purchasing Agent on or before five (5) days prior to scheduled opening.

8. DISCOUNTS

- (a) Bidders may offer a cash discount for prompt payment; however, such discounts shall NOT be considered in determining the lowest net cost for bid evaluation purposes. Bidders are encouraged to reflect cash discounts in the unit prices quoted.
- (b) In connection with any discount offered, time will be computed from the date of receipt of supplies or services or from the date a correct invoice is received, whichever is the later date. Payment is deemed to be made on the date of mailing of the check.

9. SAMPLES

Samples, when required, must be submitted within the time specified at no expense to the City of Tuscaloosa. If not destroyed or used up during testing, samples will be returned upon request at the bidder's expense, unless stated otherwise in Special Conditions or Specifications. Each individual sample must be labeled with bidder's name and manufacturer's brand name and number.

10. AWARD OF CONTRACT

- (a) The contract will be awarded to the lowest responsible bidder based upon the following factors: quality; conformity with specifications; purpose for which required; terms of delivery; transportation charges; dates of delivery.
- (b) The city reserves the right to accept and award item by item, and/or by group, or in the aggregate, unless the bidder qualifies his bid by specified limitations. Re Par.4(a)3.
- (c) If two or more bids received are for the same total amount or unit price, quality and service being equal, the contract shall be awarded to a local bidder.
- (d) Prices quoted must be FOB Tuscaloosa with all transportation charges prepaid unless otherwise specified in the Invitation to Bid.
- (e) A written award of acceptance (Purchase Order), mailed or otherwise furnished to the successful bidder shall result in a binding contract.

11. DELIVERY

- (a) Deliveries are to be FOB Destination unless otherwise specified in the Invitation to Bids.
- (b) Deliveries are to be made during regular business hours.

12. CONDITION OF MATERIALS AND PACKAGING

All items furnished must be new and free from defects. No others will be accepted under the terms and intent of this bid. All containers shall be new and suitable for storage or shipment, and price bid shall include standard commercial packaging.

13. CLAIMS

Successful bidder(s) will be responsible for making any and all claims against carriers for missing or damaged items.

14. LOCAL, STATE, AND FEDERAL COMPLIANCE REQUIREMENTS

Bidders shall comply with all local, state, and federal directives, orders and laws as applicable to this bid and subsequent contract(s).

15. PROVISION FOR OTHER AGENCIES

Unless otherwise stipulated by the bidder, the bidder agrees when submitting his bid to make available to all City agencies, departments, and in-city municipalities the bid prices he submits, in accordance with the bid terms and conditions, should any said department, agency, or municipality wish to buy under this proposal.

16. COLLUSION

The bidder, by affixing his signature to this proposal, agrees to the following: "Bidder certifies that his bid is made without previous understanding, agreement, or connection with any person, firm, or corporation making a bid for the same items and is in all respects fair, without outside control, collusion, fraud, or otherwise illegal action".

17. VARIANCE IN CONDITIONS

Any and all special conditions and specifications attached hereto which vary from General Conditions shall have precedence.

18. MINORITY / DISADVANTAGED BUSINESS ENTERPRISE PROGRAM

The City of Tuscaloosa has voluntarily adopted a Minority / Disadvantaged Business Enterprise ("MBE/DBE/WBE") Program called Tuscaloosa Builds, which is designed to encourage the participation and development of minority and disadvantaged business enterprises and to promote equal business opportunities to the fullest extent allowed by state and federal law. To learn more about this program, visit <http://www.tuscaloosarecovery.com/blog/category/tuscaloosa-builds/>.

** PRELIMINARY BID TAB WILL BE POSTED ON THE CITY'S WEBSITE ONCE AVAILABLE.

SPECIAL CONDITIONS

The General Conditions of Invitations to Bid and any Special Conditions stated shall be considered as part of the specifications of the bid.

Reference to brand names and numbers is descriptive, but not restrictive, unless otherwise specified. Bids on equivalent items meeting the standards of quality thereby indicated will be considered, providing the bid clearly describes the article offered and indicates how it differs from the referenced brands. Descriptive literature and manufacturer's specifications plus any supplemental information necessary for comparison purposes must be submitted with the bid or the bid on that item will be rejected. Reference to literature submitted with a previous bid or on file with the Division of Purchasing will not satisfy this requirement.

The burden is on the bidder to demonstrate that the item bid is equivalent to the item specified in the ITB. Any exceptions taken to any item(s) must be fully explained in written detail on bidders' letterhead and attached to the bid when submitted.

Awards shall be made or contracts entered into with the lowest responsible bidder(s) meeting all specifications and terms and conditions established by the Division of Purchasing. The Division of Purchasing reserves the right to determine the lowest responsible bidder on the basis of an individual item or group of items. Delivery dates may be a factor in awards.

The issuance of a City of Tuscaloosa Purchase Order or Purchasing Card is required to constitute a contract between the vendor and the City of Tuscaloosa, which shall bind the vendor to furnish and deliver the commodities and/or services ordered at the prices, terms, and conditions quoted.

Questions concerning the bid process should be directed to David Coggins at (205) 248-5186 or dcoggins@tuscaloosa.com (e-mail is preferred). Questions concerning Specifications should be directed to Chris Golden at (205) 248-5810.

Any addendums issued for this bid will be posted on the City Of Tuscaloosa website at <http://www.tuscaloosa.com/e-services/bids>. It is the responsibility of the bidder to check this page for any addendums before submitting their bid.

The term of this contract shall be for a period of one (1) year from the date of the Purchase Order hereof and shall automatically renew each year for up to two (2) years for a total maximum contract term of three (3) years from the date of execution hereof, unless sooner terminated pursuant to the provision herein provided. However, either party may elect not to renew the contract by giving the other party thirty (30) days written notice prior to the anniversary date, in which event the contract shall terminate on the anniversary date.

Vendor to submit the following:

- Signed Special Conditions page
- Any necessary descriptive literature and/or specifications information as outlined above and/or elsewhere in this document
- Signed Item List & Bid Submission Forms pages. If no bid is submitted for an item, please mark that line as "No Bid"
- Completed and signed Bidder's Response Form

NOTE: Sheet(s) submitted without Company Name & Signature WILL NOT be considered for bid award.

Bid submissions shall be submitted in a sealed envelope and addressed to: David Coggins, Purchasing Agent, 2201 University Blvd., Tuscaloosa, Alabama. The name and address of the bidder, the date and hour of the bid opening and the Bid Title shall be placed on the outside of the envelope.

VENDOR MUST SUBMIT AN ORIGINAL BID AND ONE COMPLETE COPY OR THE BID MAY BE REJECTED.

SPECIFICATIONS FOR FIBER OPTIC SUPPLIES

BIDDER CONSIDERATIONS

Bidder shall possess the following:

- Considerable working knowledge of Fiber Optics.
- Ability to assist with on-site cable preparations and splicing of both ends of fiber optic cable.
- Considerable working knowledge of the City of Tuscaloosa Department of Transportation (TDOT) "Traffic Management System." This knowledge would include the ability to work out logistical problems that prevent communications from being established.

GENERAL CONSIDERATIONS

- The cable shall meet all requirements stated in this specification.
- The cable shall meet the requirements set forth in United States Department of Agriculture Rural Utilities Service (RUS) 7 CFR 1755.900.
- The cable shall meet the requirements of the most recent edition of ANSI/ICEA S-87-640.
- Fiber and cable shall come from the same manufacturer to ensure complete product integration, long term reliability, and availability of fully integrated technical support.
- Manufacturer shall have a minimum of 20 years of experience in manufacturing optical fiber cable in order to demonstrate reliable field performance.
- The cable must be manufactured in a NAFTA facility.

FIBER CHARACTERISTICS

Detailed generic design and specifications information can be found at the following links:

- Dispersion un-shifted and non-zero shifted single-mode fiber:
http://csmedia.corning.com/CableSystems/Resource_Documents/generic_specifications_rl/PGSF001.pdf
- 50/125um and 62.5/125um multimode fiber:
http://csmedia.corning.com/CableSystems/%5CResource_Documents%5Cgeneric_specifications_rl%5CPGSF002.pdf

Additional fiber details:

- A Germania-doped silica core surrounded by a concentric silica glass cladding shall comprise each optical fiber.
- The fiber shall be a matched clad design manufactured by the Outside Vapor Deposition (OVD) process.
- Each optical fiber refractive index profile shall be step index.
- Each fiber shall be proof tested by the fiber manufacturer at a minimum of 100 kpsi (0.7 GN/m²).
- The fiber shall be coated with a dual acrylate protective coating and the coating shall be in physical contact with the cladding surface.
- Fiber shall be SMF28e.
- Single-mode fiber shall meet EIA/TIA-492 CAAB "Detail Specification for Class IVa Dispersion-Unshifted Single-Mode Optical Fibers with Low Water Peak," and ITU-T G.652D "Characteristics of a single-mode optical fibre and cable."
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SPECIFICATIONS FOR OUTDOOR CABLE CONSTRUCTION

- Optical fibers shall be placed inside a loose buffer tube. The nominal outer diameter of the buffer tube shall be 3.0 mm, regardless of the fiber count. The buffer tubes shall be constructed of polypropylene to ensure that it is more flexible and kink resistant. Each buffer tube shall contain up to 12 fibers. The fibers shall not adhere to the inside of the buffer tube.
- Each fiber shall be distinguishable by means of color coding in accordance with TIA/EIA-598-A, "Optical Fiber Color Coding." The fibers shall be colored with ultraviolet (UV) curable inks.
- Buffer tubes containing fibers shall be color coded with distinct and recognizable colors in accordance with TIA/EIA-598-A, "Optical Fiber Cable Color Coding."
- Buffer tube colored stripes shall be inlaid in the tube by means of co-extrusion when required. The nominal width shall be 1 mm.
- For cables containing more than 12 buffer tubes, standard colors are used for tubes 1 through 12 and stripes are used for tubes 13 through 24. The color sequence applies to tubes containing fibers only, and shall begin with the first tube. If fillers are required, they shall be placed in the inner layer of the cable. The tube color sequence shall start from the inside layer and progress outward.
- In buffer tubes containing multiple fibers, the colors shall be stable across the specified storage and operating temperature range and not subject to fading or smearing onto each other. Colors shall not cause fibers to stick together.
- Buffer tubes shall be resistant to external forces and shall meet the buffer tube cold bend and shrinkback requirements of 7 CFR 1755.900.
- Each buffer tube in a hybrid cable (cable containing more than one type of fiber) shall contain only one fiber type. Identification of fiber types in a hybrid cable shall correspond to fiber core diameter (or mode field diameter) from smallest to largest in accordance with TIA/EIA-598-B.
- Fillers may be included in the cable core to lend symmetry to the cable cross-section where needed. Fillers shall be placed so that they do not interrupt the consecutive positioning of the buffer tubes. In dual layer cables, any fillers shall be placed in the inner layer. Fillers shall have a nominal outer diameter of 3.0 mm.
- The central member shall consist of dielectric, glass reinforced plastic (GRP) rod (optional steel central member). The purpose of the central member is to provide tensile strength and prevent buckling. The central member shall be over coated with a thermoplastic when required to achieve dimensional sizing to accommodate buffer tubes/fillers.
- Each buffer tube shall contain a water-swellable yarn for water blocking protection. The water-swellable yarn shall be non-nutritive to fungus, electronically non-conductive, and homogenous. It shall also be free of dirt or foreign matter. This yarn will preclude the need for other water-blocking material. The buffer tube shall be gel free.
- Optical fibers shall not require cleaning before placement into a splice tray or fan-out kit.
- Buffer tubes shall be stranded around the dielectric central member using reverse oscillation lay (S-Z) stranding process. Water-swellable yarn(s) shall be applied longitudinally along the central member during stranding.
- Two polyester yarn binders shall be applied contra-helically with sufficient tension to secure each buffer tube layer to the dielectric central member without crushing the buffer tubes. The binders shall be non-hygroscopic, non-wicking, and dielectric with low shrinkage.
- For single layer cables, a water-swellable tape shall be applied longitudinally around the outside of the stranded tubes/fillers. The water-swellable tape shall be non-nutritive to fungus, electrically non-conductive, and homogenous. It shall also be free of dirt and foreign matter.
- At least one water-swellable yarn shall be wrapped around the central member, all along the cable, to prevent water migration down the cable core.

- Non-armored cables shall contain at least one ripcord under the sheath for easy sheath removal. Armored cables shall contain at least one ripcord under the inner sheath and at least one ripcord under the steel armor for easy sheath removal.
- Tensile strength shall be provided by the central member, and additional dielectric yarns as required.
- The dielectric yarns shall be helically stranded evenly around the cable core.
- Non-armored cables shall be sheathed with medium-density polyethylene (MDPE). The MDPE jacket/sheath shall have a minimum thickness of 1.4 mm. Jacketing material shall be applied directly over the tensile strength members (as required) and water-swellable tape. The polyethylene shall contain carbon black to provide ultraviolet light protection and shall not promote the growth of fungus. See Figure 1.

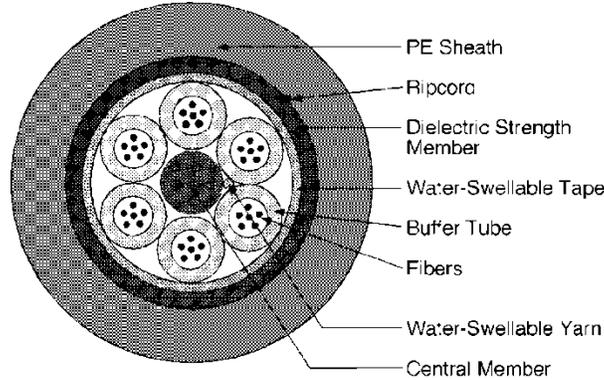


Figure 1

- Armored cables shall have an inner sheath of MDPE. The minimum nominal jacket thickness of the inner sheath shall be 1.0 mm. The inner jacket shall be applied directly over the tensile strength members (as required) and water-swellable tape. A water-swellable tape shall be applied longitudinally around the outside of the inner jacket. The armor shall be a corrugated steel tape, plastic coated on both sides for corrosion resistance, and shall be applied around the outside of the water-swellable tape with an overlapping seam with the corrugations in register. The outer jacket shall be applied over the corrugated steel tape armor. The outer jacket shall be MDPE with a minimum nominal jacket thickness of 1.4 mm. The polyethylene shall contain carbon black to provide ultraviolet light protection and shall not promote the growth of fungus. See Figure 2.

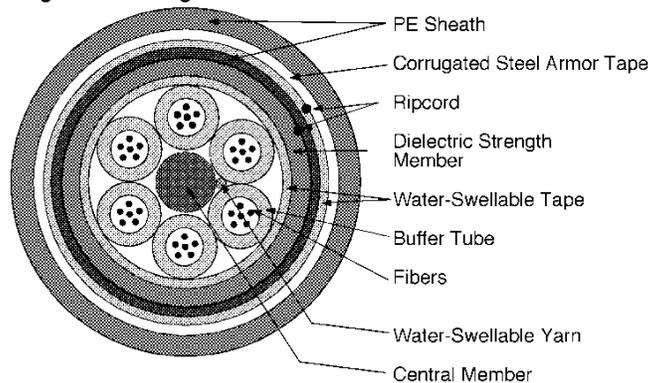


Figure 2

- The MDPE jacket material shall be as defined by ASTM D1248, Type 2 Class C and Grades J4, E7, and E8.
- The jacket/sheath shall be free of holes, splits, and blisters.
- The cable jacket/sheath shall contain no metal elements and shall be of a consistent thickness.
- Cable jackets shall be marked with the following:
 - Manufacturer's name;

- Month and year of manufacture;
 - Sequential meter or foot markings;
 - A telecommunication handset symbol as required by Section 350G of the National Electrical Safety Code (NESC);
 - Fiber count;
 - Fiber type;
 - The actual length of the cable shall be within -0/+1% of the length markings.
- Cable jacket markings shall be white, with the exception that cable jackets containing one or more coextruded white stripes shall be printed in light blue. The height of the markings shall be approximately 2.5 mm. An option of switch back marking must be available on the outer jacket to facilitate mid-span access.
 - If the initial cable jacket marking fails to meet the specified requirements (i.e. improper text, statement, color, legibility, or print interval), the cable may be remarked using a contrasting alternate color. The numbering sequence and a tag will be attached to both the outside end of the cable and to the reel to indicate the sequence of remarking. The preferred remarking color will be yellow, with the secondary choice blue.
 - The maximum pulling tension shall be 2700 N (608 lbf) during installation (short term) and 890 N (200 lbf) installed (long term).
 - The shipping, storage, and operating temperature range of the cable shall be -40 degrees Celsius to +70 degrees Celsius. The installation temperature range of the cable shall be -30 degrees Celsius to +70 degrees Celsius.

SPECIFICATIONS FOR GENERAL CABLE PERFORMANCE

- When tested in accordance with FOTP-3, "Procedure to Measure Temperature Cycling Effects on Optical Fibers, Optical Cable, and Other Passive Fiber Optic Components," the change in attenuation at extreme operational temperatures (-40 degrees Celsius and +70 degrees Celsius) shall not exceed 0.15 dB/km at 1550 nm for single-mode cable, and 0.3 dB/km at 1300 nm for multimode fiber.
- When tested in accordance with FOTP-82, "Fluid Penetration Test for Fluid-Blocked Fiber Optic Cable," a one meter length of ungauged cable shall withstand a one meter static head or equivalent continuous pressure of water for one hour without leakage through the open cable end.
- When tested in accordance with FOTP-81, "Compound Flow (Drip) Test for Filled Fiber Optic Cable," the cable shall exhibit no flow (drip or leak) of filling and/or flooding material.
- When tested in accordance with FOTP-41, "Compressive Loading Resistance of Fiber Optic Cable," the cable shall withstand a minimum compressive load of 220 N/cm (125 lbf/in) applied uniformly over the length of the sample. The 220 N/cm (125 lbf/in) load shall be applied at a rate of 2.5 mm (0.1 in) per minute. The load shall then be maintained for a period of one minute. The load shall then be decreased to 110 N/cm (63 lbf/in). Alternatively, it is acceptable to remove the 220 N/cm (125 lbf/in) load entirely and apply a 110 N/cm (63 lbf/in) load within five minutes at a rate of 2.5 mm (0.1 in) per minute. The 110 N/cm (63 lbf/in) shall then be maintained for a period of ten minutes. Attenuation measurements shall be performed before release of the 110 N/cm (63 lbf/in) load. The change in attenuation shall not exceed 0.15 dB/km at 1550 nm for single-mode cable, and 0.3 dB/km at 1300 nm for multimode fiber.
- When tested in accordance with FOTP-104, "Fiber Optic Cable Cyclic Flexing Test," the cable shall withstand 25 mechanical flexing cycles around a sheave diameter not greater than 20 times the cable diameter. The change in attenuation shall not exceed 0.15 dB/km at 1550 nm for single-mode cable, and 0.3 dB/km at 1300 nm for multimode fiber.
- When tested in accordance with FOTP-25, "Repeated Impact Test of Fiber Optic Cables and Cable Assemblies," except that the number of cycles shall be two at three locations along a one meter cable length and the impact energy

shall be at least 4.4 Nm (in accordance with ICA S-87-640), the change in attenuation shall not exceed 0.15 dB/km at 1550 nm for single-mode cable, and 0.3 dB/km at 1300 nm for multimode fiber.

- When tested in accordance with FOTP-33, "Fiber Optic Cable Tensile Loading and Bending Test," using a maximum mandrel and sheave diameter of 560 mm, the cable shall withstand a rated tensile load of 2670 N (670 lbf) and residual load of 30% of the rated installation load. The axial fiber strain shall be < 60% of the fiber proof level after completion of 60 minute conditioning and while the cable is under the rated installation load. The axial fiber strain shall be < 20% of the fiber proof level after completion of 10 minute conditioning and while the cable is under residual load. The change in attenuation at residual load and after load removal shall not exceed 0.15 dB/km at 1550 nm for single-mode cable, and 0.3 dB/km at 1300 nm for multimode fiber.
- When tested in accordance with FOTP-85, "Fiber Optic Cable Twist Test," a length of cable no greater than 2 meters shall withstand 10 cycles of mechanical twisting. The change in attenuation shall not exceed 0.15 dB/km at 1550 nm for single-mode cable, and 0.3 dB/km at 1300 nm for multimode fiber.
- When tested in accordance with FOTP-181, "Lightning Damage Susceptibility Test for Optic Cables with Metallic Components," the cable shall withstand a simulated lightning strike with a peak value of current pulse equal to 105 ka without loss of fiber continuity. A damped oscillatory test current shall be used with a maximum time-to-peak value of 15 us (which corresponds to a minimum frequency of 16.7 khz) and a maximum frequency of 30 khz. The time to half-value of the waveform envelope shall be from 40-70 us.
- When tested in accordance with FOTP-37, "Low or High Temperature Bend Test for Fiber Optic Cable," the cable shall withstand four full turns around a mandrel of < 20 times the cable diameter after conditioning for four hours at test temperature of -30 degrees Celsius and +60 degrees Celsius. Neither the inner nor outer surfaces of the jacket shall exhibit visible cracks, splits, tears, or other openings. The change in attenuation shall not exceed 0.3 dB/km at 1550 nm for single-mode cable, and 0.5 dB/km at 1300 nm for multimode fiber.

QUALITY ASSURANCE PROVISION

All cabled optical fibers greater than 1000 meters in length shall be 100% attenuation tested. The attenuation of each fiber shall be provided with each cable reel. The cable shall be ISO 9001 registered.

PACKAGING

- The completed cable shall be packaged for shipment on non-returnable wooden reels. Required cable lengths shall be stated in the purchase order.
- Top and bottom ends of cable shall be available for testing.
- Both ends of cable shall be sealed to prevent the ingress of moisture.
- Each reel shall have a weather resistant reel tag attached identifying the reel and cable.
- The reel tag shall have the following information:
 - Name of Manufacturer
 - Cable Number
 - Shipped Cable Length In Meters
 - Manufacturer Product Number
 - Date Cable Was Tested
 - Cable Length Markings:
 - A) Top (inside end of cable)
 - B) Bottom (outside end of cable)
 - Gross Weight

- Job Order Number
- Customer Order Number
- Manufacturer Order Number
- Item Number
- Cable reel shall include the following on at least one flange:
 - Name of Manufacturer
 - Country Of Origin
 - Arrow Indicating Proper Direction Of Roll When Handling
 - Forklift Handling Illustration
 - "Do Not Ship Reel On Side"
 - "Do Not Lay Reel On Side"
- Each cable shall be accompanied by a Cable Data Sheet. The Cable Data Sheet shall include the following information:
 - Name of Manufacturer
 - Manufacturer Cable Number
 - Manufacturer Product Number
 - Factory Order Number
 - Customer Name
 - Alternate Customer
 - Customer Cable Number
 - Customer Purchase Order Number
 - Alternate Code
 - Mark for Information
 - Ordered Length
 - Maximum Billable Length
 - Actual Shipped Length
 - Measured Attenuation of Each Fiber (for lengths greater than 1000 meters)
 - Band Width Specification (where applicable)
- Manufacturer shall provide 24-hour technical assistance.

ON-SITE TESTING, TRAINING & TECHNICAL ASSISTANCE

- The cable manufacturer/supplier shall provide on-the-reel testing of each fiber cable. The supplier is required to test all fibers in each reel of cable on-site, prior to installation upon request by the City. This testing is for both continuity and attenuation. The tests shall be conducted at 850 Nm for multimode fibers and at 1310 Nm for single-mode fibers. The testing shall be performed by a qualified technician using an optical time domain reflectometer (OTDR) via a pigtail splice. The resultant OTDR trace(s) shall reflect overall length and attenuation expressed in dB/km. All test results shall meet or exceed factory supplied attenuation measurements for multimode fibers, and be within +/- 0.02 dB/km of factory supplied attenuation measurements for single-mode fibers. Hard copy OTDR traces for the testing shall be supplied by the supplier prior to installation of cables.
- The cable manufacturer/supplier shall provide on-site training covering fiber optic cable placement, termination and testing. This training shall include fiber optic theory, safe cable placement techniques, cable prep, and closure installation to include mid-span access techniques. This training shall also include use of OTDRs, as well as hand held attenuation test equipment. The training shall be provided in two phases: 1) Initial on-the-job (OHT) cable installation

training; and 2) Splicing, termination, and testing OJT. The training shall be given by a BISC certified fiber optic technician or an acceptable equal as determined by the City Of Tuscaloosa.

- The cable manufacturer/supplier shall provide on-site technical assistance upon request by the City Of Tuscaloosa.

SPECIFICATIONS FOR JUNCTION BOX ENCLOSURES

- Junction Boxes for traffic signal installation shall be in accordance with State of Alabama Department of Transportation (ALDOT) specifications.
- Junction Boxes shall be constructed of non-concrete plastic mortar reinforced with heavy weave fiberglass, and shall have a static load capacity of 20,000 psi, distributed over a 10 inch by 10 inch area at the center of the cover.
- Junction Boxes shall conform to AASHTO specification H10.

SPECIFICATIONS FOR NEMA CONTROL CABINETS

- All cabinets shall meet or exceed all current NEMA and ALDOT specifications.
- Cabinets shall be "P" size cabinets.
- A terminal switch panel shall be mounted inside the "police panel" and shall consist of the following switches:
 - Signal On/Off
 - Controller On/Off
 - Flash On/Off
 - Stop Time
 - Max II
 - Manual Control, complete with push button and 6 feet of cord.
- Cabinets shall be equipped with a 110 volt electrical outlet.
- Cabinets shall be equipped with a 4 position rack mounted detector, complete with power supply, and four detector cards complete with delay feature.
- Cabinets shall have a 12 position load bay wired for 8 phase and 4 pedestrian operation to include enhanced conflict monitor.
- Depending on specific needs, the City may request mounting and hardware substitutions with supplier's concurrence.

SPECIFICATIONS FOR STREET LIGHT POLES & TRANSFORMER BASES

- Poles shall be capable of withstanding horizontal loads corresponding to static wind loading pressure at 80 mph acting on the shaft, supports, and luminaires using the luminaire sizes recommended for the pole assembly in accordance with current AASHTO requirements.
- Poles shall be of steel and shall be for nominal mounting height of 50 feet above roadway, and shall be of the breakaway transformer base type.
- Anchor bolts shall be high strength steel with minimum dimensions of 1 ¼" diameter by 48" long with a 4" right angle hook at the end, or larger bolts may be required if recommended by pole manufacturer. The threaded end and all nuts and washers shall be hot-dep galvanized. A nut, lock washer and flat washer shall be furnished with each bolt.
- Immediate shipment of anchor bolts and anchor bolt template shall be required.
- Multi-conductor grounding lugs shall be provided in each pole.

- Pole and arm assemblies shall be capable of supporting luminaires with maximum weight of 60 pounds and projected area of 1.2 square feet per mast arm assembly.
- Steel poles shall be round one-piece shafts with transformer bases hot-dipped galvanized. Steel shaft of the pole shall be fabricated from not less than #11 manufacturer's standard gauge, best grade, not rolled basic open hearth steel. The shaft shall have only one longitudinal automatically electrically welded joint, and shall have no intermediate horizontal welds. Only one length of steel sheet shall be used for shaft lengths. This sheet shall be formed into a continuously tapered shaft, having a taper not to exceed 0.14" per foot. Caps for tops of poles are to be included (if applicable).
- After forming and welding, the tapered shaft shall be longitudinally cold rolled under sufficient pressure to flatten the weld and increase the physical characteristics of the shaft so that the metal will have minimum guaranteed yield strength of 55,000 psi. The cold rolling process shall also form a round shaft.
- Bracket Arm assemblies shall consist of an upper and lower member securely jointed by means of vertical strut or struts. The upper and lower members shall be steel pipe of 2" IPS or larger. The pole end of the arm of both members shall have a steel fitting welded to it, which will permit the positioning of the arm on the plate of the pole, held only by gravity, while the arm is secured to the pole by cap screws. Bracket arms shall have a maximum allowable rise of 3' 6". Bracket arms shall be 15 feet in length.
- A one-piece steel anchor base of adequate strength, shape and size shall be secured to the lower end of the shaft by two continuous electric arc welds. The base shall telescope the shaft and the one weld shall be on the inside of the base at the end of the shaft, while the other weld shall be on the outside at the top of the base. The two welds shall be so that the welded connection shall develop the full strength of the adjacent shaft section to resist bending action.
- The base shall be provided with four slotted holes to receive the anchor bolts with 1" (+ or -) of bolt circle specified on drawings. The shaft shall have four holes for ventilation located at the body of the base directly behind each anchor bolt hole and four tapped holes for attaching ornamental covers.
- Four removable cast iron ornamental covers shall be provided with each base and each cover shall attach to the upright portion of the body of the pole by means of one hex head cap screw.
- All castings shall be clean and smooth, with all details well defined and true to pattern. Gray iron castings shall conform to ASTM Designation AT26-42 Class A. Steel castings shall conform to ASTM Designation A27-58, Grade 65-35.
- Pole and bracket arms shall be hot-dip galvanized after fabrication to give a resultant coating of 2 ounces of zinc per square foot with an average thickness of 3.2 mils.
- This type pole shall require no hand-hole opening on the round portion of the pole.
- The base shall meet the requirements of the 1976 edition of AASHTO's standard specifications for the structural supports for highway signs, luminaires and traffic signals.
- The transformer bases shall meet the breakaway performance requirements of the AASHTO standard specifications for structural supports for highway signs, luminaires, and traffic signals.
- The transformer bases shall be made to Valmont Industries Part Number MO83.
- Poles shall have dimensions to adapt to Valmont Industries Part Number MO83.
- All the above materials shall have been subjected to impact testing and approved by the Federal Highway Administration for the type of service for which they will be used.

ITEM LIST & BID SUBMISSION FORM***Schedule 1 – Fiber Optic Supplies***

ITEM	DESCRIPTION	BIDDER'S MAKE/MODEL/#	BID PRICE
1.1	144SM Cable – Corning 144EU4-XXXXXD20		
1.2	24SM24MM Cable – Corning 048XU4-XXXXXD20		
1.3	48SM12MM Cable – Corning 060XU4-XXXXXD20		
1.4	96SM Cable – Corning 096EU4-XXXXXD20		
1.5	12SM Cable – Corning 012EU4-XXXXXD20		
1.6	24SM Cable – Corning 024EU4-XXXXX20		
1.7	12SM/6MM – Corning 018XU4-XXXXXD20		
1.8	Comnet C1-US 19" Card Rack With Power Supply		
1.9	IFS DT3010 4-Port Active Optical Star (850 nm, 8 fibers multimode)		
1.10	Comnet FVT103M1 Video Transmitter/Data Transceiver (850/1300 nm, 1 fiber multimode)		
1.11	Comnet FVR103M1 Video Receiver/Data Transceiver (850/1300 nm, 1 fiber multimode)		
1.12	Comnet FVT103S1 Video Transmitter/Data Transceiver (1 fiber single-mode)		
1.13	Comnet FVR103S1 Video Receiver/Data Transceiver (1 fiber single-mode)		
1.14	Fiber Optic Closure – SCF-4C18-01-144 with trays		
1.15	Fiber Optic Closure – SCF-4C18-01-096 with trays		

Schedule 2 – Junction Box Enclosures

ITEM	DESCRIPTION	BIDDER'S MAKE/MODEL/#	BID PRICE
2.1	Junction Box (Quasite) – ALDOT "Type 1" Comm Box		
2.2	Junction Box (Quasite) – ALDOT "Type 2" Comm Box		

Schedule 3 – NEMA Control Cabinets

ITEM	DESCRIPTION	BIDDER'S MAKE/MODEL/#	BID PRICE
3.1	NEMA Control Cabinet per Specs with Standard Finish		
3.2	NEMA Control Cabinet per Specs Primed & Painted Black		

3.3	NEMA Control Cabinet per Specs with Standard Finish – With SIMSYNC-M34 GPS Time Sync Unit Installed		
3.4	NEMA Control Cabinet per Specs Primed & Painted Black – With SIMSYNC-M34 GPS Time Sync Unit Installed		
3.5	NEMA Control Cabinet EL7120H – Base Mount with Rear Door		

Schedule 4 – Street Light Poles & Transformer Bases

ITEM	DESCRIPTION	BIDDER'S MAKE/MODEL/#	BID PRICE
4.1	Street Light Poles (Complete Assembly) per Specs		
4.2	Transformer Bases (replacement) per Specs		
4.3	25' Overall Length Fiberglass Pole Complete With 15' Arm		

Schedule 5 – Camera Supplies

ITEM	DESCRIPTION	BIDDER'S MAKE/MODEL/#	BID PRICE
5.1	Bosch VGA5-624-ECS PTZ 36X NTSC Analog Camera With Std. Outdoor Pendant w/Clear Bubble		
5.2	Bosch VG4-A-PA1 Autodome Pendant Arm Mount w/120 VAC Transformer with Step-down 24VC Transformer.		
5.3	MOOG TU-PB24 Outdoor Power Supply with POE injector		
5.4	MOOG PB24M58 Outdoor Wireless Box		
5.5	Ubiquity VLRM58 Wireless Access Point (5.8 GHz)		
5.6	Transition Networks Industrial Managed Switch SISGM1040162DLR, 6 Ports 10/100/1000 & 2 10/100/1000 Combo Ports		
5.7	Transition Networks TN-GLC-BX-U SPF Transceiver Module, Cisco Compatible, 1000-BX 1310 nm, TX/1490 nm RX Single Fiber, LC, SM		
5.8	Transition Networks TN-GLC-BX-D SPF Module, Cisco Compatible, 10km 1000-BX 1490 nm, TX/1310 nm RX Single Fiber, LC, SM		
5.9	Transition Networks M/GE-PSW-LX-01 Mini 10/100/1000 Bridging Media Convertor, 1310 nm, SM, SC		
5.10	Transition Networks E-100BTX-FX-05 100BTX to 100BFX (SC) Media Convertor, 20km single fiber, 1310TX/1550RX E-100BTX-FX-05(100)		
5.11	Transition Networks E-100BTX-FX-05 100BTX to 100BFX (SC) Media Convertor, 20km single fiber, 1550TX/1310RX E-100BTX-FX-05(101)		
5.12	Mean Well RS-75-12 Power Supply		

5.13	Mean Well RS-75-48 Power Supply		
5.14	AXIS Q3709-PVE Network Camera (outdoor) with wallmount		
5.15	AXIS Q6044-E PTZ Dome Network Camera with wallmount		
5.16	AXIS P5624-E PTZ Dome Network Camera with wallmount		
5.17	AXIS P1435-LE Fixed Network Camera (outdoor) with wallmount		
5.18	Transition Networks Industrial Managed Switch SISM1040-384-LRT-B		
5.19	Transition Networks TN-GLC-BX-U-20 SPF Transceiver Module		
5.20	Transition Networks TN-GLC-BX-D-20 SPF Transceiver Module		

Schedule 6 – LED Traffic Lamps (All Must Meet ALDOT Specifications)

ITEM	DESCRIPTION	BIDDER'S MAKE/MODEL/#	BID PRICE
6.1	12" LED Red Traffic Lamp		
6.2	12" LED Yellow Traffic Lamp		
6.3	12" LED Green Traffic Lamp		
6.4	12" LED Red Arrow Traffic Lamp		
6.5	12" LED Yellow Arrow Traffic Lamp		
6.6	12" LED Green Arrow Traffic Lamp		

Schedule 7 – Pedestrian Signals & Supplies

ITEM	DESCRIPTION	BIDDER'S MAKE/MODEL/#	BID PRICE
7.1	18" Pedestrian Signal, LED w/Countdown Feature, Clamshell Mount Included, Federal Yellow, Meets ALDOT Specs. City Will Order Left or Right As Needed.		
7.2	18" Pedestrian Signal Retrofit, LED w/Countdown Feature		
7.3	Wilcox Audible Pedestrian Signal, Part No. PS/A-10		
7.4	Pedestrian Push Button, Solid State, Complete w/Base, Black or Yellow		
7.5	Navigator EN29CN-Y 2-wire push button station/Navigator CCU 2-wire control unit/Ped. Station Monitor 1 (includes hardware kit) PSM2/Special Message per unit		

Schedule 8 – Pre-Emption Devices

ITEM	DESCRIPTION	BIDDER'S MAKE/MODEL/#	BID PRICE
8.1	Sonem Model 23V/AC 3-Way Intersection Pre-emption Device		
8.2	Sonem Model 24V/AC 4-way Intersection Pre-emption Device		

Schedule 9 – LED Outdoor Luminaires

ITEM	DESCRIPTION	BIDDER'S MAKE/MODEL/#	BID PRICE
9.1	LEO-TEK Model GC1-60F-MV-NW-3-GY-700 Luminaire		
9.2	LEO-TEK Model GC1-80F-HV-NW-3-GY-700 Luminaire		
9.3	LEO-TEK Model GC1-60F-HV-NW-3-GY-700 Luminaire		

Schedule 10 – Illuminated LED Street Signs (Color/Design to be Provided by City)

ITEM	DESCRIPTION	BIDDER'S MAKE/MODEL/#	BID PRICE
10.1	3' Width Quantum Lite Edge-Lit Internally Illuminated LED Street Sign with Astro-Brac Mast Arm Mounting Hardware		
10.2	4' Width Quantum Lite Edge-Lit Internally Illuminated LED Street Sign with Astro-Brac Mast Arm Mounting Hardware		
10.3	5' Width Quantum Lite Edge-Lit Internally Illuminated LED Street Sign with Astro-Brac Mast Arm Mounting Hardware		
10.4	6' Width Quantum Lite Edge-Lit Internally Illuminated LED Street Sign with Astro-Brac Mast Arm Mounting Hardware		
10.5	7' Width Quantum Lite Edge-Lit Internally Illuminated LED Street Sign with Astro-Brac Mast Arm Mounting Hardware		
10.6	8' Width Quantum Lite Edge-Lit Internally Illuminated LED Street Sign with Astro-Brac Mast Arm Mounting Hardware		

Schedule 11 – TrafiCam/TrafiSense/TrafiCon System Components

ITEM	DESCRIPTION	BIDDER'S MAKE/MODEL/#	BID PRICE
11.1	TrafiCam-2 Camera		
11.2	TrafiCam 1TI 1-Channel Term Board		
11.3	TrafiCam 4TI Ethernet Edge 4-Channel Term Board (7250-188)		
11.4	TrafiCam Belden 9402 Cable – 1000' Reel		

11.5	TrafiCam x-stream BPL Camera, Wide Angle (7250-177)		
11.6	TrafiCam x-stream BPL Camera, Narrow Angle (7250-173)		
11.7	TrafiCon x-stream Edge Card (7250-320)		
11.8	TrafiSense BPL 7.5 mm Wide Angle Thermal Camera/Sensor (7250-348)		
11.9	TrafiSense BPL 9 mm Medium Angle Thermal Camera/Sensor (7250-334)		
11.10	TrafiSense BPL 13 mm Narrow Angle Thermal Camera/Sensor (7250-324)		
11.11	TrafiCon VIP3D.1s Vehicle Presense/Data Detector		
11.12	TrafiCon VIP3D.2s Vehicle Presense/Data Detector		
11.13	TrafiCon VIP-T Incident Module		
11.14	4TI 4-Channel Termination Board, P/N 7250-176		

Miscellaneous Traffic Signal Supplies

ITEM	DESCRIPTION	BIDDER'S MAKE/MODEL/#	BID PRICE
12	12 Gauge Stranded Wire (price per linear foot)		
13	Signal Cable, IMSA 20-1, #14, 7 Conductor, Stranded (price per linear foot)		
14	3/8" Guy Cable, Galvanized (price per linear foot), no minimum purchase requirements		
15	1/4" Guy Cable, Galvanized (price per linear foot), no minimum purchase requirements		
16	Lead-in Cable, IMSA 50-2, #14 (price per linear foot)		
17	One Case - Traffic Loop Sealant, Sausage Tube, Must Be ALDOT Approved		
18	Loop Detector, Single Channel w/Delay Feature, Must Meet Current ALDOT Specifications		
19	Card Rack Detectors, Four Channel, Plug-In Digital Loop Detectors		
20	Card Rack Power Supply, Four Outlet Plug-In, Power Supply		
21	Card Rack to Accept Plug-in Power Supply (Item 20) & Plug-in Detector. Rack to be Pre-wired for Installation with 6' Harness.		
22	Kyland Rack Mount Traffic Ethernet Switch		

23	Card Rack to Accept Kyland Rack Mount Traffic Ethernet Switch (Item 22)		
24	Buss KTK 3 Amp 600 Volt Midget Fuses – Price Each for a Minimum Purchase Quantity of 100		
25	Buss Fuse Holders, Part # HEB-LW-RYA		
26	Traffic Signal Housing (Housing Only - No Lens, Reflectors, Etc.), 3 Section, Including Span Wire Hanger. Must be ALDOT Approved.		
27	8-Phase NEMA Traffic Signal Controller Mechanism, Eagle M-52 Version or Greater, Complete with Fiber Modem Communications.		
28	Traffic Signal Uninterrupted Power Supply, Tesco Controls 22-000BBS 2kva		
29	Fiberglass/Polymer Concrete Flush Mount Pull Boxes, 20K # Load Rating, 12" W x 12" L x 18" D		
30	Luminaire Power Take Off Cable w/Surge Protector, LUMRPT01		
31	SENSYS VSN240-T Sensor		
32	SENSYS VSN240-F Sensor		
33	SENSYS RP240-BH-2 Standard Repeater		
34	SENSYS FLEX-RP-8-2 Repeater		
35	SENSYS FLEX-RP-B-LL-2 Long Life Repeater		

BIDDER'S RESPONSE FORM

MESSAGE TO BIDDERS: Please review your bid documents for accuracy, completeness, required documentation, and necessary signatures before submitting. Please label the outer mailing/shipping package with the bid information as directed.

COMPANY NAME: _____

CONTACT PERSON: _____

COMPLETE MAILING ADDRESS: _____

AUTHORIZED SIGNATURE: _____

PRINTED NAME: _____

TELEPHONE NUMBER: _____ **FAX NUMBER:** _____

E-MAIL ADDRESS: _____

DELIVERY TIME: _____

COPIES SUBMITTED:

_____ **VENDOR MUST SUBMIT AN ORIGINAL BID AND ONE COMPLETE COPY OR THE BID MAY BE REJECTED.**

NOTE: BY SIGNING THIS CONTRACT, THE CONTRACTING PARTIES AFFIRM, FOR THE DURATION OF THE AGREEMENT, THAT THEY WILL NOT VIOLATE FEDERAL IMMIGRATION LAW OR KNOWINGLY EMPLOY, HIRE FOR EMPLOYMENT, OR CONTINUE TO EMPLOY AN UNAUTHORIZED ALIEN WITHIN THE STATE OF ALABAMA. FURTHERMORE, A CONTRACTING PARTY FOUND TO BE IN VIOLATION OF THIS PROVISION SHALL BE DEEMED IN BREACH OF THE AGREEMENT AND SHALL BE RESPONSIBLE FOR ALL DAMAGES RESULTING THEREFROM.

FAILURE TO COMPLETE ALL OF THE ABOVE WITH AN AUTHORIZED SIGNATURE MAY SUBJECT BID TO REJECTION.

NON-BIDDER RESPONSE FORM

For purposes of maintaining accurate bidder's list and facilitating your firm's response to our invitation for bid, the City of Tuscaloosa is interested in ascertaining reasons for prospective bidders' failure to respond to invitations for bids. If your firm is not responding to this bid, please indicate the reason(s) by checking any appropriate item(s) below and returning this form to Mr. David Coggins, Purchasing Agent, 2201 University Blvd., Tuscaloosa, Alabama 35401. Failure to either submit a bid proposal or return this form may result in removal of your firm's name from our bidder's lists. Thank you for your cooperation.

We are not responding to this invitation for bid for the following reason(s):

___ Items or materials request not manufactured by us or not available to our company.

___ Our items or materials do not meet specifications.

___ Specifications not clearly understood or applicable (too vague, too rigid, etc.)

___ Quantities requested are too small.

___ Insufficient time allowed for preparation of bid.

___ Incorrect address used. Correct mailing address is:

___ Our branch/division handles this type of bid. Correct name and mailing address is:

___ Other reason(s): _____

Company Name: _____

Address: _____

City/State/Zip: _____

Signature: _____