



Shelby County Tennessee

Mark H. Luttrell, Jr., Mayor

SEALED BID Shelby County Government Purchasing Department

160 N. Main, Suite 550
Memphis, TN 38103

Issued: May 29, 2012
Due: June 27, 2012 at 2:30 PM (Central Standard Time)

SEALED BID # I-000170 CONGESTION MANAGEMENT PROGRAM PROJECT SET No. 6 PIN No. 040595.00

Shelby County Government is soliciting proposals for the provision of Construction Services to provide new traffic signal construction in Shelby County, Tennessee. The SEALED BID is located on the County's website at www.shelbycountyttn.gov and click the link "Department" at the top, then P for the Purchasing Department, then click on the link "Bids." Bidders are required to download the information for submittal.

A voluntary pre-bid conference will be held June 20, 2012 at 2:30 p.m. at the office of the Shelby County Roads, Bridges, and Engineering, Conference Room, 6449 Haley Road, Memphis, Tennessee 38134.

A public bid opening will be held June 27, 2012 at 2:30 p.m. in the office of the Administrator of Purchasing, located at, Vasco A. Smith Jr. Administration Building, 160 North Main Street, Suite 550, Memphis, Tennessee 38103.

The bid, as submitted, should include all estimated cost related to the services requested in this SEALED BID. If selected, you will contract with Shelby County Government pending completion of all requirements contained herein. Respondents requesting additional information or clarification are to contact, Nelson Fowler at nelson.fowler@shelbycountyttn.gov.

Proposals must be received in the office of the Administrator of Purchasing **no later than June 27, 2012 at 2:30 p.m.** Proposals should be addressed to:

**Nelson Fowler, Manager A
Shelby County Government
160 N. Main, Rm. 550
Memphis, TN 38103**

The package containing an original (**clearly identified as original**) and four (4) copies must be sealed and marked with the Bidders name and “**CONFIDENTIAL, “CONGESTION MANAGEMENT PROGRAM PROJECT SET NO 6”, Sealed Bid # I-000170**” noted on the outside.

Sincerely,

Nelson Fowler, Manager A
Purchasing Department, Shelby County Government

Office of the Shelby County Engineer
160 N. Main Street, Suite 550
Memphis, Tennessee 38103

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SECTION A

**SHELBY COUNTY GOVERNMENT
ENGINEERING DEPARTMENT**

SEALED BID DOCUMENTS

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I. INTRODUCTION

Shelby County Government (the “County”), is seeking proposals from interested and qualified firms for new traffic signal construction at the following intersections:

Holmes Road and Crumpler Road: The installation of traffic signal poles, vehicle signal displays, vehicle video detection, advance loop detection, traffic signal controller and cabinet.

Winchester Road and Champion Hills Drive: The installation of traffic signal poles, vehicle signal displays, vehicle video detection, advance loop detection, traffic signal controller, cabinet and pavement markings.

This Sealed Bid is being released to invite interested and qualified firms to prepare and submit proposals in accordance with instructions provided where the successful candidate will be selected and invited to enter into a contractual relationship with Shelby County for the Services outlined in this Sealed Bid document.

II. MINIMUM BIDDER REQUIREMENTS

All bidders must:

1. **Prime** and **LOSB** contractors must **apply** and **qualify** for an Equal Opportunity Compliance (EOC) certification number through our EOC Administration **prior to submitting your response**.
2. Firms located within the boundaries of Shelby County are required to have a current Shelby County Business License or be considered exempt from the license requirement by the Shelby County Clerks Office.
3. Meet all other requirements for the performance such as LOSB and performance requirements for Services in accordance with the provisions of this Sealed Bid.
4. Must submit a Bid Bond in the amount of 5% of their bid. This bond must be submitted with your bid.
5. The successful contractor must be able to submit a performance/labor material bond separate bonds each in the amount of 100% of the amount of the contract.
6. Must submit LOSB Form B and A with their bid. LOSB Form B must be attached to the outside of your bid envelope. Please see page 20, item M for documents to be submitted with your bid.
7. Have all appropriate licenses and certifications required in the State of Tennessee to perform the Services.
8. A written statement of compliance to Title VI and the Living Wage Ordinance must be provided by the successful contractor. Please see item “**H**” for the Living Wage Ordinance and item, “**I**” for Title VI.
9. Independent contractors (sole proprietors) must adhere to State of Tennessee Public Chapter No. 436, know as the “Tennessee Lawful Employment Act (effective date of 1/1/2012). Proof and documentation of employment eligibility must be included with the proposal.

Please Note: *As a part of doing business with Shelby County, each individual, company or organization is required to obtain a vendor number and an “Equal Opportunity Compliance” certification number.*

You can access the online application to receive the numbers indicated above at www.shelbycountyttn.gov and click the link “Department” at the top, then P for Purchasing Department, then click on the link “Conducting business with Shelby County”. Please download the application instructions and read thoroughly prior to accessing the application.

III. CORRESPONDENCE

All correspondence, proposals, and questions concerning the Sealed Bid are to be submitted to:

**Nelson Fowler, Manager A
Shelby County Government
160 N. Main St. Suite 550
Memphis, TN 38103
(901) 222-2250**

Respondents requesting additional information or clarification are to contact Nelson Fowler in writing at nelson.fowler@shelbycountyttn.gov or at the address listed above. Questions should reference the section of the SEALED BID to which the question pertains and all contact information for the person submitting the questions. ***IN ORDER TO PREVENT AN UNFAIR ADVANTAGE TO ANY RESPONDENT, VERBAL QUESTIONS WILL NOT BE ANSWERED. The deadline for submitting questions will be June 22, 2012 @ 12:00 p.m.***

Note: All written questions submitted by the deadline indicated above will be answered and posted on the County’s website at www.shelbycountyttn.gov within forty eight (48) hours of the above cut-off date.

These guidelines for communication have been established to ensure a fair and equitable process for all respondents. Please be aware that contact with any other personnel (other than the person clearly identified in this document) within Shelby County or its benefit administrators regarding this Sealed Bid may disqualify your company from further consideration.

Respondents requesting additional information or clarification are to contact Mr. Nelson Fowler in writing at nelson.fowler@shelbycountyttn.gov or at the address listed above. Questions should reference the section of the Sealed Bid to which the question pertains and all contact information for the person submitting the questions.

The vendor number is obtained through the Purchasing Department and the EOC certification is obtained through the Shelby County EOC Administration.

If you have any questions regarding the vendor number, please call the Purchasing Department @ 901-222-2250 or download the Bidder’s List Application & W-9 form at www.shelbycountyttn.gov. and click the link “Department” at the top, then P for the Purchasing Department, then click on the link “Conducting business with Shelby County” and then select,” Vendor Registration.”

If you have any questions regarding the EOC qualification, please call 901-222-1100.

IV. PROPOSAL SUBMISSION DEADLINE

All proposals must be received at the address listed above no later than **June 27, 2012 @ 2:30 PM. (CST)**. Facsimile or electronically transmitted proposals will not be accepted since they do not contain original signatures. Postmarks will not be accepted in lieu of actual receipt. Late or incomplete proposals may not be opened and considered. Under no circumstances, regardless of weather conditions, transportation delays, or any other circumstance, will extend this deadline.

V. PROPOSAL TIMELINE

Shelby County reserves the right to modify this timeline at any time. If the due date for proposals is changed, all prospective Bidders shall be notified.

Sealed Bid Released	May 29, 2012
Pre-Bid Conference	June 20, 2012 at 2:30 p.m.
Deadline for Questions	June 22, 2012 at 12:00 p.m.
Proposal Due Date	June 27, 2012 at 2:30 p.m.
Notification of Award	July 2012

The County may reproduce any of the Bidders proposal and supporting documents for internal use or for any other purpose required by law.

VI. PROPOSAL CONDITIONS

A. Contingencies

This Sealed Bid does not commit the County to award a contract. The County reserves the right to accept or reject any or all proposals if the County determines it is in the best interest of the County to do so. The County will notify all Bidders, in writing, if the County rejects all proposals.

B. Modifications

The County reserves the right to issue addenda or amendments to this Sealed Bid.

C. Proposal Submission

To be considered, all proposals must be submitted in the manner set forth in this Sealed Bid. It is the Bidders responsibility to ensure that its proposals arrive on or before the specified time.

D. Incurred Costs

This Sealed Bid does not commit the County to pay any costs incurred in the preparation of a proposal in response to this Sealed Bid and Bidders agree that all costs incurred in developing this Sealed Bid are the Bidders responsibility.

E. Final Authority

The final authority to award a contract rests solely with the Shelby County Purchasing Department.

F. Proposal Validity

Proposals submitted hereunder will be firm for one hundred twenty (120) calendar days from the due date unless otherwise qualified.

G. Disclosure of Proposal Contents

Proposer understands and acknowledges that the County is a governmental entity subject to the laws of the State of Tennessee and that any reports, data or other information supplied to the County is subject to being disclosed as a public record in accordance with the laws of the State of Tennessee. All proposals and other materials submitted become the property of Shelby County Government.

H. Living Wage Ordinance and Prevailing Wage Ordinance

Living Wage - In accordance with Ordinance Number 328, commonly referred to as the Living Wage Ordinance, all persons/entities engaged in service contracts with the County, including but not limited to both prime and subcontractors, shall pay a Living Wage to employees for all work performed on said service contract, as defined in the Living Wage Ordinance. Proof of such compensation must be evidenced as required in the Living Wage Ordinance.

Prevailing Wage – Any firm, individual, partnership or corporation awarded a contract by the COUNTY for the construction of, improvement, enlargement, alteration or replacement of a public work or project in excess of \$500,000 and any subcontractors of such public work or project in excess of \$100,000 (“Recipient”) shall be required to pay local prevailing wages and benefits for laborers, mechanics, or other listed classifications as defined by the Tennessee Department of Labor. The prevailing wage rate shall be the most current State of Tennessee prevailing wage established by the Tennessee Department of Labor For Region 1 (Shelby County). The benefit rates shall be the most current rates described in the published schedule by the Memphis and West Tennessee Building and Construction Trades Council, except as otherwise provided in the Shelby County Code of Ordinances. The applicable rate shall be determined at the time that the project is awarded. In instances where Prevailing wage applies, Prevailing Wage will override the Living Wage requirement.

I. Non-discrimination and Title VI

The contractor hereby agrees, warrants, and assures compliance with the provisions of Title VI and VII of the Civil Rights Act of 1964 and all other federal statutory laws which provide in whole or in part that no person shall be excluded from participation or be denied benefits of or be otherwise subjected to discrimination in the performance of this Contract or in the employment practices of the contractor on the grounds of handicap and/or disability, age, race, color, religion, sex, national origin, or any other classification protected by federal, Tennessee State Constitutional or statutory law. The

contractor shall upon request show proof of such non-discrimination and shall post in conspicuous places available to all employees and applicants notices of non-discrimination.

Any recipient entity shall be subject to the requirements of Title VI of the Civil Rights Act of 1964, 42 U.S.C. 2000d et seq., and regulations promulgated pursuant thereto. It shall develop a Title VI implementation plan with participation by protected beneficiaries as may be required by such law or regulations. To the extent applicable, such plan shall include Title VI implementation plans sub-recipients of federal funds through the entity. The contractor shall produce the plan upon request of Shelby County Government. Failure to provide same shall constitute a material breach of contract.

J. LOSB

SHELBY COUNTY GOVERNMENT LOCALLY OWNED SMALL BUSINESS (LOSB) PROGRAM FOR CONSTRUCTION SERVICES

CONGESTION MITIGATION PROGRAM PROJECT SET No. 6

General

Shelby County Government is committed to a policy of non-discrimination pursuant to the Equal Protection provisions of the United States Constitution. It is further the policy of Shelby County that its purchasing and contracting practices encourage the use of Locally-Owned Small Businesses (LOSB's) in all solicitations. In furtherance of these policy objectives, Shelby County seeks to afford all citizens equal opportunities to do business on county contracts and to ensure that all bidders, or Contractors doing business with Shelby County provide to LOSB's, maximum practicable opportunities, commensurate with availability, price and capabilities required, to participate on contracts which are paid for, in whole or in part, with monetary appropriations from Shelby County.

Shelby County seeks to prevent discrimination against any person or business in pursuit of these opportunities on the basis of race or gender. Shelby County will conduct its contracting and purchasing programs to discourage any discrimination and will actively seek to resolve all claims of discrimination brought against Shelby County or any Contractors involved in such contracting and purchasing programs.

Shelby County has determined that **10%** of the contract sum will be contracted with LOSB vendors. For assistance and information regarding LOSB participation, Bidders shall contact:

Ms. Doris Vester
Office of Equal Opportunity Compliance
Board of Commissioners of Shelby County
160 North Main Street, Suite 969
Memphis, Tennessee 38103
Phone: 901-222-1100

Fax: 901-222-1101

E-mail: Doris.Vester@shelbycountyttn.gov

Definitions

The definitions used in this document are as follows:

1. **“Bidder”** means any person, firm, partnership, association, or joint venture seeking to be awarded a contract or subcontract to provide goods, commodities, or services.
2. **“Certification”** or **“Certified”** means a Business that is certified by Shelby County Government under the LOSB program.
3. **“Commercially useful function”** means being responsible for the management and performance of a distinct element of the total work.
4. **“Contractor”** shall mean any person or business enterprise that submits a bid or proposal to provide labor, goods, or services to Shelby County by contract for profit in the area of construction or construction-related activities; and, any person or firm who supplies or provides labor, goods, or services to Shelby County by contract for profit.
5. **“Efforts to Achieve LOSB Participation”** means that the Contractor will solicit LOSB Participation with respect to the procurement and will consider all sub-bids and quotations received from LOSB’s. When a subcontract is not awarded to the LOSB, the Contractor must document the reason(s) the award was not made and substantiate that documentation in writing pursuant to the provisions of this Program.
6. **“Locally Owned Small Business (LOSB)”** means a business whose home office is located in Shelby County, whose annual revenues do not exceed \$3,000,000 and who has been certified by Shelby County Office of Equal Opportunity Compliance.
7. **“Non-LOSB”** means a business, which is not certified as a LOSB.
8. **“Unavailable”** means either that: (1) there is no LOSB providing goods or services requested; or, (2) no LOSB submitted a bid.

Requirements and Compliance

All firms or entities seeking to become Contractors as outlined herein are required to make good faith efforts to achieve LOSB participation when submitting a proposal or bidding on Shelby County procurements. Bidders shall not discriminate on the basis of race or gender when soliciting bids in the performance of Shelby County’s procurements. Discrimination complaints brought to the attention of Shelby County Office of Equal Opportunity Compliance (or its designee) will be reviewed and investigated to the extent necessary to determine the validity of such complaints and what actions, if any, should be taken by Shelby County.

Policies and Procedures

Shelby County may adopt policies and procedures as necessary to carry out and implement its powers and duties with regard to the LOSB Program. It is the goal of Shelby County to encourage participation by LOSB’s and to adopt rules and regulations which achieve to the greatest extent possible a level of participation by LOSB’s taking into account the total number of all Contractors and suppliers. Therefore, Shelby County will review each procurement request to determine the maximum potential for utilization of LOSB’s. This review is based on the availability of qualified LOSB’s providing goods or services as it

relates to the scope of the bid or procurement process. The following procedures may be utilized during the procurement process.

1. Pre-Bid Activity

a. Bid Language

Shelby County may insert language into each bid specification describing the LOSB Program to assure that all prospective bidders are aware of the requirements to make efforts to utilize LOSB's.

b. Notification

Shelby County may provide written notification to Contractors and LOSB's regarding pre-bid conferences; technical assistance to LOSB's; LOSB Program procedures and required documentation; and, provide a list of LOSB's who have expressed an interest in competing for the bid or in performing as a subcontractor.

2. Contractor's Responsibilities

a. Efforts to Achieve LOSB Participation

All entities seeking to become Contractors are required to make efforts to achieve maximum LOSB participation, as outlined in this LOSB Program, when submitting a response to a bid or negotiated proposal in response to a Shelby County procurement opportunity. Such Efforts should be documented on **LOSB Form "A."** and submitted with your bid.

b. Utilization

Contractors are required to utilize legitimate LOSB's in order to receive credit for the utilization of a LOSB. Contractors must document all LOSB's to be utilized, the percentage of utilization and the intended scope of work. Such information should be submitted on **LOSB Form "B."** This documentation must be submitted with the bid or negotiated proposal document.

c. Commercially Useful Functions

All LOSB's identified on **LOSB Form "C"** or **LOSB Form "D"** shall perform a Commercially Useful Function.

d. Unavailability

If a potential Contractor's efforts to obtain LOSB participation are unsuccessful due to the unavailability of a LOSB, the Contractor will submit a statement of unavailability. **LOSB Form "A."**

e. Pre-Work Conference

Any Contractor who is the successful bidder shall be required to attend a conference with Shelby County prior to beginning the work. The primary purpose of this conference is to review the project scope and review LOSB participation as outlined in **LOSB Form "B."** Shelby County will also review the Statement of Intent to Perform as a Subcontractor or Provide Supplies or Services as documented on **LOSB Form "C."**

f. Post-Award Change

Any Contractor who determines that a LOSB identified on **LOSB Form "B"** cannot perform shall request approval from Shelby County to contract with an alternate subcontractor pursuant to this LOSB Program.

Such request will be reviewed and approved only after adequate documentation for the proposed change is presented.

g. **LOSB Certification**

Each month the Contractor shall submit **LOSB Form “D”** certifying all payments made to LOSB’s.

3. LOSB Responsibilities

a. **Commercially Useful Function**

It is the responsibility of each LOSB providing subcontracted goods and/or services to submit **LOSB Form “C”** certifying that it is performing the work and that it is a Commercially Useful Function.

Written Agreement

Shelby County policies and procedures on LOSB participation are designed to create contractual relationships between Contractors and LOSB’s. Therefore, a Contractor may utilize the services of a LOSB in estimating and satisfying the scope of work, provided that a written contract/agreement is executed between the Contractor and the LOSB.

Certification

To ensure that the ownership and control over decision-making and day-to-day operations of a Certified LOSB is legitimate, Shelby County reserves the right to verify the ownership and control of each LOSB utilized.

Monitoring LOSB Utilization

Shelby County intends to monitor and enforce this LOSB Program. Shelby County reserves the right to conduct random audits of each of its Contractor’s/ LOSB’s. Shelby County reserves the right to reevaluate a LOSB’s certification at any time.

Efforts to Achieve LOSB Participation

The Contractor shall consider all bids and/or quotations received from LOSB’s. When a subcontract is not awarded by a Contractor to any of the competing LOSB’s, the Contractor must document the reason(s) the award was not made to the LOSB’s. It is the responsibility of the Contractor to prove that it employed Efforts to Achieve LOSB participation. Evidence supporting the Contractor’s Efforts must be documented on **LOSB Form “A,”** which must include, but is not limited to, the following:

1. Contractor must submit proof that it solicited LOSB participation through reasonable and available means including, but not limited to:
 - a. Written notices to LOSB’s who have the capability to perform the work of the contract or provide the service;
 - b. Direct mailing, electronic mailing, facsimile or telephone requests.
2. Contractor must submit proof that it provided interested LOSB’s with adequate information about plans, requirements and specifications of the contract in a timely manner to assist them in responding to a solicitation.
3. Contractor must submit proof that it made Efforts to Achieve LOSB Participation including, but not limited to, proof that it made opportunities available to LOSB

suppliers and identified opportunities commensurate with opportunities made available and identified to Non LOSB's. Such proof will include the names of businesses, contact person(s), addresses, telephone numbers, and, a description of the specifications for the work selected for subcontracting.

4. Contractor must submit proof that it allowed LOSB's the opportunity to review bid specifications, blue prints and all other bid related items at no charge. The Contractor must allow sufficient time for review prior to the bid deadline.
5. Contractor must submit proof that it made Efforts to Achieve LOSB Participation by not rejecting a LOSB as unqualified or unacceptable without sound reasons based on a thorough investigation of their capabilities. Contractor must submit proof of the basis for rejecting any LOSB deemed unqualified or unacceptable by the Contractor. The Contractor will not impose unrealistic conditions of performance on LOSB's seeking subcontracting opportunities.

The Contractor must fully cooperate with Shelby County in its post-contract award LOSB Program audit and compliance efforts.

Substitution of LOSB's after Contract Award

In order to make a substitution of a LOSB, a Contractor must make a request to Shelby County.

This request must be submitted in writing to Shelby County. Shelby County reserves the right to approve any substitution of a LOSB. The Contractor has the responsibility to provide Shelby County with a reasonable basis for the substitution. If the Contractor desires to substitute the LOSB with a Non-LOSB, then the Contractor must comply with the Effort to Achieve LOSB Participation provisions set forth herein.

Noncompliance with LOSB Program

Any of the following reasons, individually or collectively, may result in suspension from bidding, prohibition from contracting, or cancellation of contracts:

1. The failure to perform according to contract provisions relating to this LOSB Program;
 2. Violation of, circumvention of, or failure to comply with the LOSB Program; and/or,
- Other reasons deemed appropriate by Shelby County.

Questions and Information

Questions regarding this LOSB Program and requests for information should be directed to:

Ms. Doris Vester
Office of Equal Opportunity Compliance
Board of Commissioners of Shelby County
160 North Main Street, Suite 969
Memphis, Tennessee 38103
Phone: 901-222-1100
Fax: 901-222-1101
E-mail: Doris.Vester@shelbycountyttn.gov

Construction

This LOSB Program is consistent with Shelby County Policies and Procedures. Wherever conflicts exist, the provision in the Shelby County Policies and Procedures will prevail.

LOSB Program Forms Description

- **LOSB Form A -- Certification of Efforts**

Contractors are required to submit **LOSB Form "A"** with proposals as evidence and documentation of efforts that have been made to contact LOSB's for participation as subcontractors, joint venture partners, or suppliers of goods and services. Contractors are required to contact LOSB's and solicit quotes for goods and services. All responses to the Contractor's solicitation should be recorded and reported.

- **LOSB Form B -- LOSB Utilization Plan**

A Contractor is required to submit **LOSB Form "B"** with its Proposal in order to identify all LOSB's they propose to utilize in providing the goods and services included in the Proposal. Contractors may only include a proposed provider of goods or services on **LOSB Form "B,"** if the entity is a legitimate LOSB. Additionally, if such entity will provide services, Contractors may only list LOSB's on **LOSB Form "B"** if the entity will perform a Commercially Useful Function. The Successful Contractor will be required to finalize and submit **LOSB Form "B"** prior to award of a contract. **LOSB Form "B"** will be incorporated into the contract and will become a contractual obligation of the Successful Contractor. **LOSB Form "B"** shall not be changed or altered after award of a contract without approval from Shelby County. The Contractor is required to provide written notice describing the reasons for any proposed change to Shelby County and to obtain approval from Shelby County of any changes to **LOSB Form "B."**

LOSB Form C --Statement of Intent to Perform as a Subcontractor or Provide Supplies or Services.

Contractors are required to have each subcontracted LOSB providing services complete **LOSB Form "C"** certifying that it is performing the work and that it is a Commercially Useful Function.

- **LOSB Form D -- Statement of Payments to LOSB's**

Contractors are required to record and maintain information regarding the utilization of LOSB's and all other information during the performance of awarded contracts. This information shall be recorded and maintained on **LOSB Form "D."** The form is required to be submitted to Shelby County each month. **LOSB Form "D"** must be completed in its entirety with information regarding the types of goods purchased from LOSB's or the types of services rendered by LOSB's and dollars amounts paid for their goods or services.

**Shelby County
 LOSB Program
 LOSB FORM A
 CERTIFICATION OF EFFORTS TO ACHIEVE LOSB PARTICIPATION
 (To Be Submitted with the Bid/Proposal)**

Company Name: _____
Bid No.: _____

I certify that the following efforts were made to achieve LOSB participation: **YES NO**

A	Provided written notices to LOSB's who have the capability to perform the work of the contract or provide the service		
B	Direct mailing, electronic mailing, facsimile or telephone requests		
C	Provided interested LOSB's with adequate information about plans, requirements and specifications of the contract in a timely manner to assist them in responding to a solicitation		
D	Allowed LOSB's the opportunity to review bid specifications, blue prints and all other bid/SEALED BID related items at no charge, and allowed sufficient time for review prior to the bid deadline		
E	Acted in good faith with interested LOSB's, and did not reject LOSB's as unqualified or unacceptable without sound reasons based on a thorough investigation of their capabilities		
F	Did not impose unrealistic conditions of performance on LOSB's seeking subcontracting opportunities		

Additionally, I contacted the referenced LOSB's and sealed bid/proposal. The responses I received were as follows:

Name and Address of LOSB	Type of Work And Contract Items, Supplies or Services to be Performed	Response	Reason for Not Accepting Bid/Proposal

(If additional space is required, this form maybe duplicated)

If applicable, please complete the following:

I hereby certify that LOSB's were "Unavailable" as defined in the LOSB Program to submit bids to provide goods and services for this SEALED BID's purpose.

Reasons for the "Unavailability":

Submitted by:

 Authorized Representative Signature

 Title

 Date

**Shelby County
LOSB Program**

LOSB FORM B

LOSB UTILIZATION PLAN

(To Be Submitted with the Bid/Proposal)

Company: _____

Bid No.: _____

I, _____, do certify that on the following procurement opportunity,
(Contractor)

_____, the following LOSB's will be utilized as sub-contractors,
(Opportunity)
suppliers, or to provide professional services:

Name	Description of Work	Contract Value	LOSB Number

(If additional space is needed this form may be duplicated)

TOTAL CONTRACT VALUE: _____

TOTAL % OF LOSB PARTICIPATION: _____

The successful bidder is required to finalize and submit this form prior to award of a contract. Joint Venture Agreements, partnering agreements and all pertinent information must be presented prior to contract award. This information will be incorporated into the contract and will become a contractual obligation of the successful bidder. The finalized LOSB Form B shall not be changed or altered after award of a contract without approval from Shelby County. The successful bidder is required to provide written notice describing the reasons for the change to Shelby County to obtain approval of any changes to LOSB Form B.

Submitted by:

Authorized Representative Signature

Title

Date

**Shelby County
LOSB Program
LOSB FORM C**

**STATEMENT OF INTENT TO PERFORM AS A SUBCONTRACTOR OR
PROVIDE SUPPLIES OR SERVICES
(To Be Submitted Prior to Contract Award)**

Company Name: _____
Bid No.: _____

I, _____, intend to provide supplies or services in connection with the
(Subcontractor/Provider)
above **bid/proposal** request as a LOSB.

I am prepared to perform a “**Commercially Useful Function**” in connection with the above project.

The following are the work items to be performed:

at the following price: \$_____.

If applicable, please complete the following:

I have or will enter into a formal agreement with _____ for the above-
(Company)
described scope of work, supplies, or services conditioned upon the execution of a contract
with Shelby County.

I hereby certify that this statement is true and correct:

Business Information: Submitted by: _____

Business: _____ Authorized Representative (Print):

Address: _____

Title: _____

Phone: _____ Authorized Representative's Signature:

Facsimile: _____ Date: _____

**Shelby County
LOSB Program**

LOSB FORM D

STATEMENT OF PAYMENTS TO LOSB'S
(To Be Submitted Monthly and with Final Payment Request)

Company Name: _____

Name/Contract No.: _____

Payment Request Number: _____

Name of Firm	Description of work	Total Amount Due This Month	Total Dollars Paid To Date	% of Contract Completed	Start Date of Contract	End Date of Contract

(If additional space is needed this form may be duplicated)

I hereby certify that this statement is true and that above payments have been made.

Business Information:

Submitted by:

Business: _____

Authorized Representative (Print):

Address: _____

Title: _____

Phone: _____

Authorized Representative's Signature:

Facsimile: _____

Date: _____

LOCALLY OWNED SMALL BUSINESS PURCHASING PROGRAM RULES AND REGULATIONS:

1. The Administrator of Purchasing in conjunction with the Administrator of EOC shall identify certain goods and services required by the County to be set aside for special purchasing procedures for locally owned small businesses.
2. Only certified locally owned small businesses will be allowed to submit competitive bids on the goods or services identified under paragraph (i) above.
3. The Administrator of Purchasing shall, in conjunction with the Administrator of EOC, annually review the Shelby County Capital Improvement Program to determine those projects with a construction cost of \$250,000 or more. Contracts amounting to at least ten (10%) of the construction costs of such project shall be awarded to locally owned small businesses as defined herein, except as set forth in sub-paragraph (vi) of this section, either as part of the conditions of the solicitation for general contractors bidding on these projects, or as separate bids issued by the County for subcontracts that may be assigned to general contractors.
4. After adhering to all other bidding and purchasing requirements of the County, not inconsistent with this part, if no bids are received from locally owned small businesses, then the County may solicit bids for the goods or services from all other sources.
5. On all purchases and/or contracts entered into by the County, the Purchasing Administrator or his or her designee shall have the right to negotiate with any supplier of goods or services to the County for the inclusion of locally owned small business subcontractors and/or suppliers in the contract award.
6. Failure by a supplier or contractor to include locally owned small business subcontractors or suppliers in its bid or contract may be grounds for rejection of said bid or contract unless the supplier or contractor can show documented evidence of good cause why none were included.
7. Any locally owned small business awarded a contract or purchase order under this section shall not sublet, subcontract, or assign any work or services awarded to it without the prior written consent of the Mayor or the Purchasing Administrator.
8. As to those purchases below the requirement for a formal bid solicitation (currently, under \$15,000) and not included in the locally owned small business set aside, the Administrator of Purchasing shall determine if any locally owned small business offers that product or service. If so, at least one such eligible locally owned small business should be included in the vendors contacted for an opportunity to bid, and the Administrator of Purchasing may, at his discretion, designate in a purchase order the purchase of such goods and services from the identified locally owned small business.
9. In those situations where a locally owned small business as defined herein, engages in open competitive bidding for County contracts, the Administrator of Purchasing shall provide for a preference for the locally owned small business where responsibility and quality are equal. Said preferences shall not exceed five percent (5%) of the lowest possible bidder meeting specifications. The preference shall be applied on a sliding scale in the following manner:
 - a. A preference of up to five percent (5%) shall be allowed for contracts up to

\$ 500,000.00;

- b. A preference of up to three and five-tenths percent (3.5%) shall be allowed for contracts up to \$750,000.00;
- c. A preference of two and one-half percent (2.5%) shall be allowed for contracts up to \$1,000,000.00;
- d. A preference of two percent (2%) shall be allowed for contracts that exceed \$1,000,000.00.

10. For construction contracts over \$2,000,000.00, the Administrator of Purchasing shall provide for a preference of two percent (2%) to general contractors meeting the requirements of Section 1, Subparagraph B, if fifty percent (50%) or more of the total work comprising the bid has been or will be awarded to certified locally owned small businesses. The fifty percent subcontracting threshold must be met prior to contract execution.

11. The Administrator of Purchasing may divide a single bid package for any purchase of goods and services into two or more smaller bid packages in any case that the Administrator of Purchasing reasonably believes that the smaller bid packages will result in a greater number of bids by locally owned small businesses.

12. The Administrator of Purchasing, upon approval of the County Mayor, may establish special insurance and bonding requirements for certified locally owned small businesses so long as they are not in conflict with the laws of the State of Tennessee.

13. The Administrator of Purchasing, with the approval of the County Mayor, shall adopt and promulgate, and may from time to time, amend rules and regulations not inconsistent with the provisions of this ordinance, governing the purchase of goods and services from locally owned small business concerns to effectuate and implement the Locally Owned Small Business Purchasing Program within the intent of this ordinance.

14. The Administrator of EOC shall, in conjunction with the Administrator of Purchasing, provide a written quarterly report to the Mayor and Board of Commissioners which shall include a summary of the purchases selected for this program, a listing of the contracts awarded to locally owned small businesses for the period, and the dollar amounts of each such contract, and the percentage which such contracts bear to the total amount of purchases for the period.

K. DRUG-FREE WORKPLACE AFFIDAVIT

STATE OF _____

COUNTY OF _____

The undersigned, principal officer of _____, an employer of five (5) or more employees contracting with _____ County government to provide construction services, here states under oath as follows:

1. The undersigned is a principal officer of _____ (hereinafter referred to as the "Company"), and is duly authorized to execute this Affidavit on behalf of the Company.
2. The Company submits this Affidavit pursuant to T.C.A. § 50-9-113, which requires each employer with no less than five (5) employees receiving pay who contracts with the state or any local government to provide construction services to submit an affidavit stating that such employer has a drug-free workplace program that complies with Title 50, Chapter 9, of the *Tennessee Code Annotated*.
3. The Company is in compliance with T.C.A. ~ 50-9-113. Further affiant smith not.
Principal Officer

STATE OF _____

COUNTY OF _____

Before me personally appeared with whom I am personally acquainted (or proved to me on the basis of satisfactory evidence), and who acknowledged that such person executed the foregoing affidavit for the purposes therein contained. Witness my hand and seal at office this day of _____.

Notary Public

My commission expires:

**SHELBY COUNTY GOVERNMENT
GRATUITY DISCLOSURE FORM**

INSTRUCTIONS: *This form is for all persons receiving any Shelby County Government contract, subcontract, land use approval or financial grant of money to report any gratuity that has been given, directly or indirectly, to any elected official, employee or appointee (including their spouses and immediate family members) who is involved in the decision regarding the contract, land use approval, or financial grant of money.*

1. NAME:

2. DATE OF GRATUITY:

3. NATURE AND PURPOSE OF THE GRATUITY:

4. NAME OF THE OFFICIAL, EMPLOYEE, APPOINTEE, OR FAMILY MEMBER WHO RECEIVED THE GRATUITY:

5. NAME OF THE PERSON OR ENTITY THAT PROVIDED THE GRATUITY:

6. ADDRESS OF THE PERSON OR ENTITY THAT PROVIDED THE GRATUITY:

7. DESCRIPTION OF THE GRATUITY:

8. COST OF THE GRATUITY: (If cost is unknown and not reasonably discernible by the person giving the gratuity, then the person giving the gratuity shall report a good faith estimate of the cost of the gratuity.)

9. AFFIDAVIT:

The information contained in this Gratuity Disclosure Form, and any supporting documentation or materials referenced herein or submitted herewith, is true and correct to the best of my knowledge, information and belief and affirm that I have not given, directly or indirectly, any gratuity to any elected official, employee or appointee (including spouse and immediate family members) that has not been disclosed and I affirm that I have not violated the provisions of the Shelby County Government Code of Ethics.

Signature

Date

Print Name

A copy of your completed form will be placed on the Shelby County Internet Website.

M FORMS TO BE SUBMITTED:

LOSB FORM A: MUST BE COMPLETED AND SUBMITTED IN YOUR BID ENVELOPE.

LOSB FORM B: MUST BE COMPLETED, SUBMITTED WITH YOUR BID AND ATTACHED TO THE OUTSIDE OF THE ENVELOPE DOCUMENTING ALL LOSB'S TO BE UTILIZED, THE PERCENTAGE OF UTILIZATION AND THE INTENDED SCOPE OF THE WORK.

LOSB FORM C- MUST BE COMPLETED AND SUBMITTED BY EACH LOSB PROVIDING SUBCONTRACTED GOODS AND OR SERVICES CERTIFYING THAT THEY ARE PERFORMING THE WORK AND THAT IT IS A COMMERCIALY USEFUL FUNCTION. ONLY REQUIRED AFTER THE AWARD OF THE BID.

LOSB FORM D-MUST BE COMPLETED AND SUBMITTED BY THE SUCCESSFUL CONTRACTOR EACH MONTH CERTIFYING ALL PAYMENTS MADE TO LOSB'S.

DRUG FREE WORKPLACE AFFIDAVIT – MUST BE COMPLETED AND SUBMITTED WITH YOUR BID.

BID BOND – ALL BIDS MUST BE ACCOMPANIED BY A BANK CERTIFIED CHECK OF BANK DRAFT, LETTER OF CREDIT ISSUED BY ANY NATIONAL BANK OR APPROVED BID BOND FOR NOT LESS THAN 5% (PERCENT) OF THE AMOUNT OF THE BID. ALL PROPOSAL GUARANTEES SHALL BE MADE OUT TO THE COUNTY OF SHELBY.

NOTE: THE SUCCESSFUL CONTRACTOR WILL SUBMIT LOSB FORM C AND D.

FAILURE TO SUBMIT THE REQUIRED FORMS MAY RESULT IN YOUR BID BEING REJECTED AS BEING IN NON-COMPLIANCE WITH BID REQUIREMENTS.

VII. General Requirements:

A. Scope of Work

The County proposes the installation of new traffic signal construction at the following intersections:

Holmes Road and Crumpler Road: The installation of traffic signal poles, vehicle signal displays, vehicle video detection, advance loop detection, traffic signal controller and cabinet.

Winchester Road and Champion Hills Drive: The installation of traffic signal poles, vehicle signal displays, vehicle video detection, advance loop detection, traffic signal controller, cabinet and pavement markings.

B. Project Time Frame

The work under this contract shall be substantially completed within two hundred forty (240) calendar days.

C. Reservation of Rights

The County reserves the right, for any reason to accept or reject any one or more proposals, to negotiate the term and specifications for the services provided, to modify any part of the Sealed Bid, or to issue a new Sealed Bid.

D. Selection Criteria

Contract(s) will be awarded based on the lowest responsive proposals received. The contents of the proposal of the successful Bidders will become contractual obligations and failure to accept these obligations in a contractual agreement may result in cancellation of the award.

E. Additional Information and References

Any additional information that would be helpful to the County evaluating your proposal, including a list of current and former clients with a similar profile to Shelby County should be submitted.

VIII. Award of contract:

Bidders are advised that the lowest responsive proposal per set will be awarded the contract.

IX. NOTICE TO BIDDERS

Time and Place of Opening Bids:

**June 27, 2012 at 2:30 p.m.
Shelby County Government
160 North Main Street, Suite 550
Memphis, Tennessee 38103**

Receipt of Bids:

Sealed Bid's for the improvements described herein will be received at THE OFFICE OF THE SHELBY COUNTY ADMINISTRATOR OF PURCHASING, ROOM 550, SHELBY COUNTY ADMINISTRATION BUILDING, 160 NORTH MAIN, MEMPHIS, TENNESSEE 38103, until **June 27, 2012 @ 2:30 PM.**

Description of Work:

The proposed work is officially known as: **CONGESTION MANAGEMENT PROGRAM – PROJECT SET No. 6**

Pre-Bid Meeting:

Bidders are encouraged to attend a pre-bid meeting to be held on **June 20, 2012 @ 2:30 P.M.** at the office of the Shelby County Road, Bridges, and Engineering Conference Room, 6449 Haley Road, Memphis, Tennessee 38134.

Instruction to Bidders:

- (a) The SELAED BID MUST BE DOWNLOADED FROM THE SHELBY COUNTY GOVERNMENT WEBSITE at www.shelbycountyttn.gov and click the link "Department" at the top, then P for the Purchasing Department, then click on the link "Bids."
- (b) All bids must be accompanied by a bank cashier's check or bank draft, letter of credit issued by any national bank or certificate of deposit therein, duly assigned, or certified check or approved bid bond for not less than five (5) percent of the amount of the bid. All proposal guarantees shall be made out to the COUNTY OF SHELBY.
- (c) All bidders must be licensed by the Tennessee State Board of Licensing
- (d) General Contractors Evidence of this license must appear on the title page of the Proposal in the space provided, and also on the exterior of the sealed envelope. The envelope enclosing each bid must show the Contractor's name, license number, expiration date thereof, and license classification of the contractor(s) bidding for the prime contract and for the masonry, electrical, plumbing, heating, ventilation, and air conditioning subcontracts in accordance with TCA 62-6-119. Lacking all of this information, the bid shall be rejected and returned to the bidder unopened.

EOC Requirements:

As a condition precedent to bidding, bidders shall have received a current "Equal Opportunity Compliance Eligibility Number" which must be attached to each bid submission. To receive an E.O.C. Eligibility Number, specific information must be received by the E.O.C. Department at least 48 hours prior to the bid opening. To verify your E.O.C. Number or to receive information for obtaining a number, contact the E.O.C. Department, 222-1100. Use of Locally Owned Small Business (LOSB) participation on County projects is mandatory.

Bidders are encouraged to contact County-certified LOSB firms from the listing that can be obtained from Shelby County EOC department. Bidders may also provide the names of firms they believe would qualify as LOSB firms, by notifying the E.O.C. Department and filing the required forms at least five (5) working days prior to the bid opening

A Locally Owned Small Business is defined as a sole proprietorship, corporation, partnership, or joint venture located within Shelby County and at least 51% owned, operated and managed by a Shelby County resident and having an average annual sale of \$5,000,000.00 or less over the past three (3) years.

Rejection of Bids:

The **COUNTY OF SHELBY** reserves the right to reject any and all proposals and to waive technicalities in any proposal.

BY ORDER OF:

CLIFTON DAVIS

**PURCHASING ADMINISTRATOR
SHELBY COUNTY GOVERNMENT**

_____, 2012



Shelby County Tennessee

Contract Documents

For
CONGESTION MANAGEMENT PROGRAM
PROJECT SET NO. 6
(PIN # 040595.00)

Issued: May 29, 2012

Due: June 27, 2012 at 2:30 PM (Central Standard Time)

Office of the Shelby County
Engineering
160 N. Main Street, Suite 550
Memphis, TN 38103

SECTION B

**SHELBY COUNTY GOVERNMENT
ENGINEERING DEPARTMENT**

PROPOSAL

TO THE SHELBY COUNTY ADMINISTRATOR OF PURCHASING, SHELBY COUNTY, TENNESSEE.

1. Name of Bidder: _____

Business Address: _____

Federal I.D. Number _____

Phone Number: _____

PROJECT NAME: CONGESTION MITIGATION PROGRAM – PROJECT SET No. 6 (PIN # 040595.00).

2. Plans and Specifications:

The plans and specifications for the proposed improvements are those prepared by or under the supervision of the SHELBY COUNTY ENGINEER, and approved by the SHELBY COUNTY DIRECTOR OF PUBLIC WORKS, which plans are designated as: CONGESTION MANAGEMENT PROGRAM PROJECT SET #6. Please see General Conditions Section 4.01 for additional information.

3. Interested Parties:

In submitting this proposal, the undersigned Contractor or bidder declares that the only persons or parties interested in the proposal as principals are those named herein; and that the proposal is made without collusion with any person, firm or corporation.

4. Bidder Familiar with the Plans, Specifications and the Site:

The undersigned further declares that the proposal, plans and specifications, general requirements and conditions, form of contract and contract bond, and special provisions have been carefully examined and the site of the proposed work has been inspected in detail. The undersigned further declares to be familiar with all the local conditions affecting the contract and the detailed requirements of construction, and understands that, in making this proposal, all rights to plead any misunderstanding regarding the same are waived. The Bidder declares that the wording herein, which may contain changes from similar documents from previous projects of Shelby County Government, has been reviewed. The Bidder further declares that the instructions regarding the Shelby County Equal Opportunity Compliance, which is bound with this proposal, have been examined, and agrees that these documents are an integral part of this bid.

5. Bidder to Furnish:

The undersigned further understands and agrees to furnish and provide all necessary materials, equipment, labor and incidentals required to produce and install the items as listed in this proposal upon acceptance of the proposal by Shelby County Government, except such materials as are to be furnished by the County, in the manner and at the time therein prescribed, and in accordance with the requirements therein set forth.

6. Quantities and Payment:

The undersigned understands that the quantities provided herein by the County are approximate only and that they are subject to increase or decrease; that the undersigned shall take in full payment therefore the amount of the total bid as shown on the bid form, after accounting for any and all bid alternates made and accepted by the County.

7. Unit Prices:
The undersigned further agrees that the unit prices submitted herewith are for the purpose of obtaining a gross sum, and for the use in computing the values of extras and deductions; that if there is any discrepancy between the gross sum bid and that resulting from the summation of the quantities multiplied by the respective unit prices, the latter shall apply..
8. Alteration of Work:
The undersigned further agrees that if the County decides to extend or shorten the improvement, or otherwise alter the work by extras or deductions, including the elimination of any one or more of the items, by an amount not to exceed twenty-five (25%) percent of the total money value of the original contract price or contract price corrected as provided in the general conditions, the undersigned shall perform the work as altered, increased or decreased at the contract unit prices.
9. Extra Work or Changes:
The undersigned further agrees that the Engineer may at any time during the progress of the work covered by this contract, order other work or materials incidental thereto and that all such work and materials as do not appear in the proposal or contract as a specific item accompanied by a unit price, and which are not included under the bid price for other items in this contract, shall be performed as extra work, and that the undersigned accepts as full compensation for the extra work, payment as provided for in the general conditions.
10. Time of Execution of Contract:
The undersigned further agrees to execute a contract for the contract work and present same to the County within fourteen (14) days after the date of notice of award of the contract.
11. Contract Bond:
The undersigned further agrees that within fourteen (14) days after the date of notice of the award of the contract, the undersigned, along with an appropriate surety shall execute a contract bond satisfactory to and in the form prescribed by the County in the penal sum of the full amount of the contract, guaranteeing the faithful performance of the work in accordance with the terms of the contract.
12. Term:
The undersigned further agrees to begin work on the project not later than ten (10) days after the execution and approval of the contract and contract bond and on receipt of a notice to commence work, unless otherwise provided, and to prosecute the work in such manner and with sufficient materials, equipment and labor as will insure completion of the work within the time limit specified herein, it being understood and agreed that the completion within the time limit is an essential part of the contract. The undersigned agrees to complete the work within **240** calendar days, unless additional time shall be granted by the Engineer in accordance with the provisions of the general conditions. In case of failure to complete the work within the time described herein or within such extra time as may have been allowed by extensions, the undersigned agrees that the County shall withhold, from such sums as may be due under the items of his contract, the costs as set forth in Section 8 of the General Conditions, which costs shall be considered and treated not as a penalty but as damages due the County from the undersigned by reason of inconvenience to the public, added cost of engineering, supervision, maintenance of detours, and other items which have caused an expenditure of funds resulting from the failure of the undersigned to complete the work within the time specified in the contract.
13. **NOT USED**

14. Clean-Up of Construction Site:

The undersigned further agrees to provide necessary clean up of construction areas, such as collection of debris, construction materials, dirt piles, etc., and any other unsightly and unnecessary items. In the event it is determined by the Engineer that necessary clean up is not being provided by the undersigned, the Engineer shall officially notify the undersigned of the problem. If the undersigned

has not begun to provide satisfactory clean-up of the area within fifteen (15) days after the notice, then the Engineer shall take the necessary steps to eliminate the problem including, but not limited to, performing the work with County forces, or contracting with outside forces at the Engineer's option, documenting all expenses incurred performing the work. Prior to releasing any securities covering this contract, all expenses incurred by the County in said clean-up operation shall be paid in full by the undersigned.

15. Forfeiture of Bid Bond:

The undersigned further agrees that in the event of failure to provide required licensure to execute the contract and to present a contract bond to the County within fourteen (14) days as per Paragraph #10 above, the Contractor's bid bond shall be forfeited as damages for project delay and the notice of award shall be automatically cancelled. The contract shall then be awarded to the next lowest qualified bidder.

16. Bid Bond:

Accompanying this proposal shall be a bank cashier's check, certified check, letter of credit issued by any national bank or a duly assigned certificate of deposit, bank draft or approved bid bond, complying with the requirements of the general conditions and/or as shown on the Notice to Contractors, made payable to THE COUNTY OF SHELBY. The amount of the check, draft, letter of credit issued by any national bank or certificate of deposit therein, duly assigned, or approved bid bond shall be no less than five percent (5%) of the total bid. If this proposal is accepted and the undersigned fails to execute a contract and contract bond as required herein, it is hereby agreed that the amount of the check, draft, letter of credit issued by any national bank or certificate of deposit therein, duly assigned, or approved bid bond shall be considered as payment of damages due to delay and other causes suffered by the County because of failure to execute the contract and contract bond. Otherwise, said check, draft, letter of credit, issued by any national bank or certificate of deposit therein, duly assigned or approved bid bond shall be returned to the undersigned.

ATTACH BANK DRAFT, BANK CASHIER'S CHECK, LETTER OF CREDIT
ISSUED BY ANY NATIONAL BANK OR CERTIFICATE OF DEPOSIT THEREIN,
DULY ASSIGNED, APPROVED BID BOND OR CERTIFIED CHECK HERE.
THE UNDERSIGNED SHALL PROVIDE BELOW THE FOLLOWING INFORMATION
TOTAL AMOUNT OF BID BOND \$ _____

In the event that one check, draft or approved bid bond or other indemnity as set out above is intended to cover two or more proposals, the amount must be equal to the sum of proposal guarantees required for the projects covered. If this check, draft or approved bid bond, or other indemnity as set out above, is placed in another proposal, the undersigned shall provide below, the name of said proposal.

LOCATION OF BID BOND _____.

17. Schedule of Prices:

The undersigned shall complete and submit a Schedule of Prices covering the work performed under this contract. Unit prices shall be bid for each of the items in the schedule and extensions showing the total contract price shall be provided. Failure to provide said unit prices in their entirety or to provide extensions, including the total contract price, may result in rejection of this proposal as informal or irregular.

18. Joint Ventures:
Each contractor or contracting firm who is a member of a joint venture shall provide a current license number prior to the execution of the final contract. Each contractor or contracting firm who is a member of a joint venture shall sign the contract holding each, both jointly and severally liable to the total project. In a joint venture, each member's classification limits shall be equal to or greater than those classifications' proportionate share of the total cost of the project. A joint venture shall allow the members to combine their license limits in order to undertake a larger project than each would normally be able to perform with their individual license. The classification of each member in the joint venture shall be a necessary and integral part of the total project.
19. Acceptance or Rejection of Bid(s):
The Shelby County Government reserves the right to reject any and all bids. The Shelby County Government also reserves the right to select the lowest responsible bidder for any one project to the rejection of all other bidders or award any or all projects to the lowest responsible bidder or bidders.
20. **NOT USED**

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BID FORM						
CONGESTION MANAGEMENT PROGRAM (PROJECT SET #6)						
ITEM	ITEM NO	DESCRIPTION	UNIT	TOTAL	UNIT PRICE	AMOUNT
	1	105-01	CONSTRUCTION STAKES, LINES AND GRADES	LS	1	
1,2	2	209-05	SEDIMENT REMOVAL	C.Y.	4	
1,2	3	209-09.43	CURB INLET PROTECTION (TYPE 4)	EACH	2	
	4	712-01	TRAFFIC CONTROL	LS	1	
	5	713-17	REMOVAL OF SIGNS, POSTS AND FOOTINGS	LS	1	
	6	713-15.07	SUSPENDED FLAT SHEET ALUMINUM SIGN (0.080" THICK)	EACH	14	
	7	713-16.30	SIGNS (STREET NAME SIGN, "WINCHESTER RD")	EACH	2	
	8	713-16.31	SIGNS (STREET NAME SIGN, "CHAMPION HILLS DR")	EACH	2	
	9	713-16.32	SIGNS (STREET NAME SIGN, "HOLMES RD")	EACH	2	
	10	713-16.33	SIGNS (STREET NAME SIGN, "CRUMPLER RD")	EACH	2	
	11	716-02.04	PLASTIC PAVEMENT MARKING (CHANNELIZATION STRIPING)	S.Y.	50	
	12	716-02.05	PLASTIC PAVEMENT MARKING (STOP LINE)	L.F.	130	
	13	716-02.06	PLASTIC PAVEMENT MARKING (TURN LANE ARROW)	EACH	4	
	14	716-08.01	REMOVAL OF PAVEMENT MARKING (LINE)	L.F.	250	
	15	716-12.01	ENHANCED FLATLINE THERMO PAVEMENT MARKING (4 IN. LINE)	L.M.	0.33	
	16	717-01	MOBILIZATION	LS	1	
3	17	730-01.10	OVERHEAD UTILITY RELOCATION	LS	1	
	18	730-02.08	SIGNAL HEAD ASSEMBLY (130 POLE-MOUNTED)	EACH	8	
4	19	730-02.09	SIGNAL HEAD ASSEMBLY (130 WITH BACKPLATE)	EACH	20	
	20	730-03.20	INSTALL PULL BOX (TYPE A)	EACH	6	
	21	730-03.21	INSTALL PULL BOX (TYPE B)	EACH	12	
	22	730-03.24	INSTALL PULL BOX (FIBER OPTIC-TYPE B)	EACH	2	
	23	730-05.01	ELECTRICAL SERVICE CONNECTION	EACH	2	
	24	730-08.01	SIGNAL CABLE - 3 CONDUCTOR	L.F.	400	
	25	730-08.02	SIGNAL CABLE - 5 CONDUCTOR	L.F.	1125	
	26	730-08.03	SIGNAL CABLE - 7 CONDUCTOR	L.F.	2250	
	27	730-08.04	SIGNAL CABLE - 9 CONDUCTOR	L.F.	300	
	28	730-08.05	SIGNAL CABLE - 12 CONDUCTOR	L.F.	550	
	29	730-09.01	SPAN WIRE ASSEMBLY	L.F.	1025	
	30	730-10.01	TETHER WIRE ASSEMBLY - 1/4" DIAMETER	L.F.	1025	
	31	730-11.01	STEEL CONDUIT RISER ASSEMBLY	EACH	1	
	32	730-12.01	CONDUIT 1" DIAMETER (PVC)	L.F.	1950	
	33	730-12.03	CONDUIT 3" DIAMETER (PVC)	L.F.	150	
5	34	730-13.02	VEHICLE DETECTOR (VIDEO)	EACH	2	
6	35	730-13.06	VEHICLE DETECTOR (OPTICALLY ACTIVATED PRIORITY CONTROL)	EACH	2	
	36	730-14.01	SHIELDED DETECTOR CABLE	L.F.	2600	
	37	730-14.02	SAW SLOT	L.F.	350	
	38	730-14.03	LOOP WIRE	L.F.	750	
7	39	730-16.12	CONTROLLER (8 - PHASE WITH TYPE IV CABINET)	EACH	2	
	40	730-21.10	WOOD POLE (SIGNAL SUPPORT, CLASS 1, 40' HEIGHT)	EACH	1	
	41	730-22.02	GUYING DEVICE (ANGLE ANCHOR)	EACH	2	
	42	730-23.02	STEEL STRAIN POLE (34' HEIGHT, 19" DIAMETER)	EACH	7	
	43	740-11.01	TEMPORARY SEDIMENT TUBE 8IN (SIGNAL POLE)	L.F.	270	
	44	801-03	WATER (SEEDING & SODDING)	M.G.	1	
1	45	803-01	SODDING (NEW SOD)	S.Y.	50	
TOTAL BID						

BID FORM FOOTNOTES:

- TO BE USED AS DIRECTED BY THE ENGINEER.
- SEE SUBSECTION 209.07 OF THE TENNESSEE DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR MAINTENANCE REPLACEMENT.
- ALLOWANCE FOR MLG&W TO ADJUST OVERHEAD UTILITIES ONLY. ALLOWANCE WILL BE ADJUSTED IF FINAL COST PROVIDED BY MLG&W AFTER WORK IS COMPLETE IS DIFFERENT. ITEM 730-05.01 WILL BE USED FOR CONTRACTOR TO PROVIDE SERVICE CONNECTION FROM POWER SOURCE TO CONTROLLER CABINET.
- ALL SIGNAL HEAD BACKPLATES SHALL BE CONSTRUCTED OF ALUMINUM SHEETS PER STANDARD SPECIFICATIONS OF THE TENNESSEE DEPARTMENT OF TRANSPORTATION DATED MARCH 1, 2008.
- TO BE ITERIS VANTAGE SYSTEM OR APPROVED EQUIVALENT. INCLUDES DETECTION CAMERAS, PROCESSING UNIT, CARD RACK, POWER SUPPLY UNIT, MONITOR, MOUSE, AND ALL OTHER CABLING, CONNECTIONS, AND HARDWARE TO COMPLETE THE INSTALLATION OF A FULLY FUNCTIONAL VIDEO DETECTION SYSTEM.
- TO BE 3M OPTICOM SYSTEM OR APPROVED EQUIVALENT. INCLUDES OPTICAL DETECTORS, CONFIRMATION LAMPS (PAR 90), POLE-MOUNTED BEACONS, FOUR-CHANNEL PHASE SELECTOR, CARD RACK (OPTICOM 760) AND ALL OTHER CABLING, CONNECTIONS, AND HARDWARE TO COMPLETE THE INSTALLATION OF A FULLY FUNCTIONAL PREEMPTION SYSTEM, INCLUDING FINE TUNING.
- THE TRAFFIC SIGNAL CONTROLLER SHALL BE AN EAGLE EPAC M52 KEYBOARD UNIT OR APPROVED EQUIVALENT WITH BUILT IN PORT 3 FIBER MODEM (SINGLE MODE) AND BUILT IN STRETCH AND DELAY FEATURES FOR EACH PHASE. THE TRAFFIC CONTROLLER INSTALLATION ALONG WITH ALL AUXILIARY EQUIPMENT TO BE INSTALLED IN THE CABINET SHALL BE MANUFACTURED, SUPPLIED AND INSTALLED IN ACCORDANCE WITH THE LATEST CITY OF MEMPHIS TRAFFIC SIGNAL CONTROLLER AND CABINET SPECIFICATIONS. THE INSTALLATION SHALL HAVE A 12-CHANNEL MALFUNCTION MONITOR UNIT INSTALLED AS MODEL EDI SSM12LE-P.

IF AN INDIVIDUAL:

SIGNATURE OF BIDDER: _____

BUSINESS ADDRESS: _____

IF A CO-PARTNERSHIP:

FIRM NAME: _____

BY: _____

BUSINESS ADDRESS: _____

NAME AND ADDRESS
OF ALL MEMBERS OF
FIRM

IF A CORPORATION:

CORPORATE NAME _____

SIGNED BY: _____
President

BUSINESS ADDRESS: _____

(Corporate Seal)

NAME OF OFFICERS _____
President

Secretary

Treasurer

ATTEST: _____
Secretary

CONTRACT
by and between
SHELBY COUNTY GOVERNMENT
and

for
CONGESTION MITIGATION PROGRAM – PROJECT SET No. 6 (PIN# 040595.00)

This contract (the “Contract”) entered into this _____ day of _____, 2012, and between SHELBY COUNTY GOVERNMENT, hereinafter referred to as “COUNTY” and _____, hereinafter referred to as “CONTRACTOR”.

WITNESSETH

WHEREAS, the COUNTY issued Sealed Bid # I-000170 for Congestion Mitigation Program, hereinafter in this Contract referred to as "PROJECT"; and

WHEREAS, said CONTRACTOR submitted a bid/proposal in accordance with bid specifications, a copy of which is attached hereto as Exhibit "B" and incorporated herein by reference, of which said bid was accepted by COUNTY.

NOW, THEREFORE, for and in consideration of the mutual promises and covenants herein contained, CONTRACTOR agrees and undertakes the PROJECT in accordance with the Bid Specifications which are on file in the Shelby County Purchasing Department and which are incorporated herein by reference at the price quoted for said PROJECT by CONTRACTOR.

I. SCOPE OF WORK

1. The CONTRACTOR shall provide the services as outlined within the County’s SEALED BID Number I000xxx Congestion Mitigation Program – Project Set No. 6 and the CONTRACTOR’S response thereto which are attached hereto as Exhibits “A” and “B” respectively and incorporated herein by reference as if stated verbatim (the “Services”).
2. CONTRACTOR shall coordinate all work with COUNTY through Robert Evans, P.E., Shelby County Senior Engineer, 6463 Haley Road, Memphis, TN 38134.
3. The CONTRACTOR shall give a Performance Bond and Labor and Material Bond, each equal to 100% of the amount of the Contract, with surety to be approved by the COUNTY, conditioned upon the full and faithful performance of all the terms and conditions of the Contract with special reference to paying in full in lawful money of the United States, all just and valid claims for material and labor entered into for the said work covered by this Contract. That further, this Contract shall not take effect until these Bonds have been executed and approved by the County.
4. All work by CONTRACTOR is to be performed in a manner satisfactory to COUNTY, and in accordance with the established customs, practices and procedures of COUNTY. CONTRACTOR is to periodically request sufficient conferences to insure that the work is

being done by CONTRACTOR in a satisfactory manner in accordance with the specifications as set forth in Exhibit A and as directed by the County Engineer.

II. **TERM AND COMPENSATION**

1. The term of this Contract (the "Term") will commence upon execution of this Contract and continue for (240) days or until project completion, but in no event shall this Contract extend beyond ninety days after completion and acceptance of construction.
2. The COUNTY agrees to compensate the CONTRACTOR for the provision of the Services an amount not to exceed _____ Dollars ("the Fee") during the term of this Contract which shall include all reimbursable expenses. It is the duty of the CONTRACTOR to monitor such fees, costs, and expenses to ensure the CONTRACTOR does not exceed this total dollar amount. The COUNTY expressly reserves the right to deny payment of any amount billed in excess of \$_____.
3. The CONTRACTOR shall submit invoices to the COUNTY in accordance with the payment schedule as set forth below. Invoices shall be submitted in duplicate to the address set forth in the NOTICE section of this Contract to the attention of Mr. Robert Evans. The COUNTY shall pay such invoices within sixty (60) days of its receipt and approval of said invoices. The COUNTY is not obligated to pay, and will withhold from payment, any amounts the COUNTY has in dispute with the CONTRACTOR based on CONTRACTOR'S non-performance or negligent performance of any of the Services under this Contract.

III. **GENERAL CONDITIONS**

The parties further agree as follows:

1. **CONTROL**
All Services by the CONTRACTOR will be performed in a manner satisfactory to the COUNTY, and in accordance with the generally accepted business practices and procedures of the COUNTY.
2. **CONTRACTOR'S PERSONNEL**
The CONTRACTOR certifies that it presently has adequate qualified personnel to perform all Services required under this Contract. All work performed during the Term of this Contract will be supervised by the CONTRACTOR. The CONTRACTOR further certifies that all of its employees assigned to serve the COUNTY have such knowledge and experience as required to perform the duties assigned to them. Any employee of the CONTRACTOR who, in the opinion of the COUNTY, is incompetent, or whose conduct becomes detrimental to the work, shall immediately be removed from association with the Services under this Contract.
3. **INDEPENDENT STATUS**
 - a. Nothing in this Contract shall be deemed to represent that the CONTRACTOR, or

any of the CONTRACTOR's employees or agents, are the agents, representatives, or employees of the COUNTY. The CONTRACTOR will be an independent CONTRACTOR over the details and means for performing the Services under this Contract. Anything in this Contract which may appear to give the COUNTY the right to direct the CONTRACTOR as to the details of the performance of the Services under this Contract or to exercise a measure of control over the CONTRACTOR is solely for purposes of compliance with local, state and federal regulations and means that the CONTRACTOR will follow the desires of the COUNTY only as to the intended results of the scope of this Contract.

- b. It is further expressly agreed and understood by CONTRACTOR that neither it nor its employees or agents are entitled to any benefits which normally accrue to employees of the COUNTY; that CONTRACTOR has been retained by the COUNTY to perform the Services specified herein (not hired) and that the remuneration specified herein is considered fees for the Services performed (not wages) and that invoices submitted to the COUNTY by CONTRACTOR for the Services performed shall be on the CONTRACTOR's letterhead.

4. REPORTS

CONTRACTOR shall prepare and submit quarterly reports of its activities, funded under this Contract, to the originating department and the Contract Administration Department of the COUNTY. The reports shall include an itemization of the use of COUNTY's funds, pertinent information pursuant to the applicable Living Wage Ordinance, and shall be inclusive of specific Services delivered. Any such reports provided to the COUNTY shall be prepared with the understanding that the COUNTY may make such reports available to the public. The quarterly reports and all books of account and financial records that are specific to the work performed in accordance with this Contract may be subject to audit by the Director of the Division of Administration and Finance of the COUNTY. The COUNTY shall have the right to withhold future disbursement of funds under this Contract and any future Contracts until this provision has been met.

5. TERMINATION OR ABANDONMENT

- a. It shall be cause for the immediate termination of this Contract if, after its execution, the COUNTY determines that:
 - i) Either the CONTRACTOR or any of its principals, partners or corporate officers, if a corporation, including the corporation itself, has pled nolo contendere, or has pled or been found guilty of a criminal violation, whether state or federal, involving, but not limited to, governmental sales or purchases, including but not limited to the rigging of bids, price fixing, or any other collusive and illegal activity pertaining to bidding and governmental contracting; or

- ii) CONTRACTOR has subcontracted, assigned, delegated, transferred its rights, obligations or interests under this Contract without the COUNTY's consent or approval; or
 - iii) CONTRACTOR has filed bankruptcy, become insolvent or made an assignment for the benefit of creditors, or a receiver, or similar officer has been appointed to take charge of all or part of CONTRACTOR assets.
- b. The COUNTY may terminate the Contract upon five (5) days written notice by the COUNTY or its authorized agent to the CONTRACTOR for CONTRACTOR's failure to provide the Services specified under this Contract.
- c. This Contract may be terminated by either party by giving thirty (30) days written notice to the other, before the effective date of termination (the "Termination Date"). In the event of such termination, the CONTRACTOR shall be paid for all Services rendered prior to the Termination Date, provided the CONTRACTOR shall have delivered to COUNTY such statements, accounts, reports and other materials as required under this Contract; however, CONTRACTOR shall not be compensated for any anticipatory profits that have not been earned as of the date of the Termination Date. All Services completed by CONTRACTOR prior to the Termination Date shall be documented and tangible work documents shall be transferred to and become the sole property of the COUNTY prior to payment for the Services rendered.
- d. Notwithstanding the above or any section herein to the contrary, CONTRACTOR shall not be relieved of liability to the COUNTY for damages sustained by the COUNTY by virtue of any breach of the Contract by CONTRACTOR and the COUNTY may withhold any payments to CONTRACTOR for the purpose of setoff until such time as the exact amount of damages due the COUNTY from CONTRACTOR is determined.
- e. The COUNTY has the option to cancel the Agreement and/or any Renewals if the County is put on notice of legal problems with CONTRACTOR or any of its principals, partners, corporate officers, or agents, involving allegations of dishonesty, improper business conduct, or criminal activity. Cancellation under this provision shall be immediate and effective upon notice. The COUNTY reserves the right to exercise this provision at its discretion and any decision rendered by the COUNTY under this provision constitutes a final determination of the matter the public welfare requiring it.

6. COMPENSATION FOR CORRECTIONS

No compensation shall be due or payable to CONTRACTOR pursuant to this Contract for any CONTRACTOR's Services performed by the CONTRACTOR in connection with effecting of corrections to the design of the Services, when such corrections are required as a direct result of negligence by the CONTRACTOR to properly fulfill any of his obligations as set forth in this Contract.

7. SUBCONTRACTING, ASSIGNMENT OR TRANSFER
- a. Any subcontracting, assignment, delegation or transfer of all or part of the rights, responsibilities, or interest of either party to this Contract is prohibited unless by written consent of the other party. No subcontracting, assignment, delegation or transfer shall relieve the CONTRACTOR from performance of the Services under this Contract. The COUNTY shall not be responsible for the fulfillment of the CONTRACTOR's obligations to its transferors or subcontractors.
 - b. Upon the request of the other party, the subcontracting, assigning, delegating or transferring party shall provide all documents evidencing the subcontract, assignment, delegation or transfer.
8. CONFLICT OF INTEREST
- The CONTRACTOR covenants that it has no public or private interest, and will not acquire directly or indirectly any interest which would conflict in any manner with the performance of the Services. The CONTRACTOR warrants that no part of the total Contract Fee shall be paid directly or indirectly to any officer or employee of the COUNTY as wages, compensation, or gifts in exchange for acting as officer, agent, employee, subcontractor or CONTRACTOR to the CONTRACTOR in connection with any work contemplated or performed relative to this Contract.
9. CONTINGENT FEES
- The CONTRACTOR warrants that it has not employed or retained any company or person other than a bona fide employee working solely for the CONTRACTOR, to solicit or secure this Contract, and that it has not paid or agreed to pay any company or person, other than a bona fide employee working solely for the CONTRACTOR any fee, commission, percentage, brokerage fee, gift, or any other consideration contingent upon or resulting from the award or making of this Contract. For breach or violation of this warranty, the COUNTY will have the right to recover the full amount of such fee, commission, percentage, brokerage fee, gift, or other consideration.
10. EMPLOYMENT OF COUNTY WORKERS
- The CONTRACTOR will not engage, on a full, part-time, or any other basis during the Term of the Contract, any professional or technical personnel who are or have been at any time during the Term of the Contract in the employ of the COUNTY.
11. ACCESS TO RECORDS
- During all phases of the work and Services to be provided hereunder, CONTRACTOR agrees to permit duly authorized agents and employees of the COUNTY to enter CONTRACTOR's offices for the purpose of inspections, reviews and audits during normal working hours. Reviews may also be accomplished at meetings that are arranged at mutually agreeable times and places. The CONTRACTOR will maintain all books, documents, papers, accounting records, and other evidence pertaining to the Fee paid under this Contract and make such materials available at their offices at all reasonable times during the Term of this Contract and for three (3) years from the date

of payment under this Contract for inspection by the COUNTY or by any other governmental entity or agency participating in the funding of this Contract, or any authorized agents thereof. Copies of said records shall be furnished to the COUNTY upon request.

12. ARBITRATION

Any dispute concerning a question of fact in connection with the work not disposed of by agreement between the CONTRACTOR and the COUNTY will be referred to the Shelby County Contract Administrator or its duly authorized representative, whose decision regarding same will be final.

13. RESPONSIBILITIES FOR CLAIMS AND LIABILITIES

- a. CONTRACTOR shall indemnify, defend, save and hold harmless the COUNTY, and its elected officials, officers, employees, agents, assigns, and instrumentalities from and against any and all claims, liability, losses or damages—including but not limited to Title VII and 42 USC 1983 prohibited acts—arising out of or resulting from any conduct; whether actions or omissions; whether intentional, unintentional, or negligent; whether legal or illegal; or otherwise that occur in connection with or in breach of this Contract or in the performance of the Services hereunder, whether performed by the CONTRACTOR its subcontractors, agents, employees or assigns. This indemnification shall survive the termination or conclusion of this Contract.
- b. CONTRACTOR expressly understands and agrees that any insurance protection required by this Contract or otherwise provided by the CONTRACTOR shall in no way limit the responsibility to indemnify, defend, save and hold harmless the COUNTY or its elected officials, officers, employees, agents, assigns, and instrumentalities as herein provided.
- c. The COUNTY has no obligation to provide legal counsel or defense to CONTRACTOR or its subcontractors in the event that a suit, claim or action of any character is brought by any person not a party to this agreement against CONTRACTOR as a result of or relating to performance of the Services under this Contract.
- d. Except as expressly provided herein, the COUNTY has no obligation for the payment of any judgment or the settlement of any claims against CONTRACTOR as a result of or relating to performance of the Services under this Contract.
- e. CONTRACTOR shall immediately notify the COUNTY of any claim or suit made or filed against CONTRACTOR or its subcontractors regarding any matter resulting from or relating to CONTRACTOR's performance of the Services under this Contract and will cooperate, assist and consult with the COUNTY in the defense or investigation thereof.

14. GENERAL COMPLIANCE WITH LAWS

- a. The CONTRACTOR certifies that it is qualified or will take steps necessary to qualify to do business in the State of Tennessee and that it will take such action as, from time to time, may be necessary to remain so qualified and it shall obtain, at its

expense all licenses, permits, insurance, and governmental approvals, if any, necessary to the performance of the Services under this Contract.

- b. The CONTRACTOR is assumed to be familiar with and agrees that at all times it will observe and comply with all federal, state, and local laws, ordinances, and regulations in any manner affecting the performance of the Services. The preceding shall include, but is not limited to, compliance with all Equal Employment Opportunity laws, the Fair Labor Standards Act, Occupational Safety and Health Administration (OSHA) requirements, and the Americans with Disabilities Act (ADA).
- c. This Contract will be interpreted in accordance with the laws of the State of Tennessee. By execution of this Contract, the CONTRACTOR agrees that all actions, whether sounding in contract or in tort, relating to the validity, construction, interpretation and enforcement of this Contract will be instituted and litigated in the courts of the State of Tennessee, located in Shelby County, Tennessee, and in no other. In accordance herewith, the parties to this Contract submit to the jurisdiction of the courts of the State of Tennessee located in Shelby County, Tennessee.

15. NON-DISCRIMINATION

The CONTRACTOR hereby agrees, warrants, and assures compliance with the provisions of Title VI and VII of the Civil Rights Act of 1964 and all other federal statutory laws which provide in whole or in part that no person shall be excluded from participation or be denied benefits of or be otherwise subjected to discrimination in the performance of this Contract or in the employment practices of the CONTRACTOR on the grounds of handicap and/or disability, age, race, color, religion, sex, national origin, or any other classification protected by federal, Tennessee State Constitutional or statutory law. The CONTRACTOR shall upon request show proof of such non-discrimination and shall post in conspicuous places available to all employees and applicants notices of non-discrimination.

16. ENTIRE AGREEMENT

This Contract represents the entire and integrated agreement between the parties and supersedes all prior negotiations, representations or agreements, whether oral or written.

17. AMENDMENT

This Contract may be modified or amended only by written instrument signed by both parties.

18. SEVERABILITY

If any provision of this Contract is held to be unlawful, invalid or unenforceable under any present or future laws, such provision shall be fully severable; and this Contract shall then be construed and enforced as if such unlawful, invalid or unenforceable provision had not been a part hereof. The remaining provisions of this Contract shall remain in full force and effect and shall not be affected by such unlawful, invalid or unenforceable provision or by its severance here from. Furthermore, in lieu of such unlawful, invalid, or unenforceable

provision, there shall be added automatically as a part of this Contract a legal, valid and enforceable provision as similar in terms to such unlawful, invalid or unenforceable provision as possible.

19. NO WAIVER OF CONTRACTUAL RIGHT

No waiver of any term, condition, default, or breach of this Contract, or of any document executed pursuant hereto, shall be effective unless in writing and executed by the party making such waiver; and no such waiver shall operate as a waiver of either (a) such term, condition, default, or breach on any other occasion or (b) any other term, condition, default, or breach of this Contract or of such document. No delay or failure to enforce any provision in this Contract or in any document executed pursuant hereto shall operate as a waiver of such provision or any other provision herein or in any document related hereto. The enforcement by any party of any right or remedy it may have under this Contract or applicable law shall not be deemed an election of remedies or otherwise prevent such party from enforcement of one or more other remedies at any time.

20. MATTERS TO BE DISREGARDED

The titles of the several sections, subsections, and paragraphs set forth in this contract are inserted for convenience of reference only and shall be disregarded in construing or interpreting any of the provisions of this Contract.

21. SUBJECT TO FUNDING

This Contract is subject to annual appropriations of funds by the Shelby County Government. In the event sufficient funds for this Contract are not appropriated by Shelby County Government for any of its fiscal period during the Term hereof, then this Contract will be terminated. In the event of such termination, the CONTRACTOR shall be entitled to receive just and equitable compensation for any satisfactory work performed as of the Termination Date.

22. TRAVEL EXPENSES

All travel expenses payable under this Contract shall be in accordance with the County Travel Policy and Procedures. This includes advance written travel authorization, submission of travel claims, documentation requirements, and reimbursement rates. No travel advances will be made by the County.

23. NON-LIABILITY FOR CONTRACTOR EMPLOYEE TAXES

Neither CONTRACTOR nor its personnel are COUNTY's employees, and COUNTY shall not take any action or provide CONTRACTOR's personnel with any benefits and shall have no liability for the following:

- a. Withholding FICA (Social Security) from CONTRACTOR's payments;
- b. Making state or federal unemployment insurance contributions on behalf of CONTRACTOR or its personnel;
- c. Withholding state and federal income tax from payment to CONTRACTOR;
- d. Making disability insurance contributions on behalf of CONTRACTOR;

- e. Obtaining workers' compensation insurance on behalf of CONTRACTOR or CONTRACTOR's personnel.

24. INCORPORATION OF OTHER DOCUMENTS

- a. CONTRACTOR shall provide Services pursuant to this Contract in accordance with the terms and conditions set forth within the Shelby County Sealed Bids/Bids as well as the Response of CONTRACTOR thereto, all of which are maintained on file within the Shelby County Purchasing Department and incorporated herein by reference.
- b. It is understood and agreed between the parties that in the event of a variance between the terms and conditions of this Contract and any amendment thereto and the terms and conditions contained either within the Sealed Bids/Bids or the Response thereto, the terms and conditions of this Contract as well as any amendment shall take precedence and control the relationship and understanding of the parties.

25. CONTRACTING WITH LOCALLY OWNED SMALL BUSINESSES

The CONTRACTOR shall take affirmative action to assure that Locally Owned Small Businesses that have been certified by the COUNTY are utilized when possible as sources of supplies and equipment, construction and services.

26. LIVING WAGE ORDINANCE AND PREVAILING WAGE ORDINANCE

Living Wage - In accordance with Ordinance Number 328, commonly referred to as the Living Wage Ordinance, all persons/entities engaged in service contracts with the County, including but not limited to both prime and subcontractors, shall pay a Living Wage to employees for all work performed on said service contract, as defined in the Living Wage Ordinance. Proof of such compensation must be evidenced as required in the Living Wage Ordinance.

Prevailing Wage – Any firm, individual, partnership or corporation awarded a contract by the COUNTY for the construction of, improvement, enlargement, alteration or replacement of a public work or project in excess of \$500,000 and any subcontractors of such public work or project in excess of \$100,000 ("Recipient") shall be required to pay local prevailing wages and benefits for laborers, mechanics, or other listed classifications as defined by the Tennessee Department of Labor. The prevailing wage rate shall be the most current State of Tennessee prevailing wage established by the Tennessee Department of Labor For Region 1 (Shelby County). The benefit rates shall be the most current rates described in the published schedule by the Memphis and West Tennessee Building and Construction Trades Council, except as otherwise provided in the Shelby County Code of Ordinances. The applicable rate shall be determined at the time that the project is awarded. In instances where Prevailing wage applies, Prevailing Wage will override the Living Wage requirement.

27. RIGHT TO REQUEST REMOVAL OF CONTRACTOR'S EMPLOYEES

The COUNTY may interview the personnel CONTRACTOR assigns to COUNTY's work. COUNTY shall have the right, at any time, to request removal of any employee(s) of

CONTRACTOR, whom COUNTY deems to be unsatisfactory for any reason. Upon such request, CONTRACTOR shall use all reasonable efforts to promptly replace such employee(s) with substitute employee(s) having appropriate skills and training.

28. INCORPORATION OF WHEREAS CLAUSES

The foregoing whereas clauses are hereby incorporated into this Contract and made a part hereof.

29. DISCLOSURE OF REPORTS, DATA OR OTHER INFORMATION

Notwithstanding anything to the contrary contained herein or within any other document supplied to COUNTY by CONTRACTOR, CONTRACTOR understands and acknowledges that COUNTY is a governmental entity subject to the laws of the State of Tennessee and that any reports, data or other information supplied to COUNTY by CONTRACTOR due to Services performed pursuant to this Contract is subject to being disclosed as a public record in accordance with the laws of the State of Tennessee.

30. ORGANIZATION STATUS AND AUTHORITY

- a. CONTRACTOR represents and warrants that it is a corporation, limited liability company, partnership, or other entity duly organized, validly existing and in good standing under the laws of the state of Tennessee; it has the power and authority to own its properties and assets and is duly qualified to carry on its business in every jurisdiction wherein such qualification is necessary.
- b. The execution, delivery and performance of this Contract by the CONTRACTOR has been duly authorized by all requisite action and will not violate any provision of law, any order of any court or other agency of government, the organizational documents of CONTRACTOR, any provision of any indenture, agreement or other instrument to which CONTRACTOR is a party, or by which CONTRACTOR's respective properties or assets are bound, or be in conflict with, result in a breach of, or constitute (with due notice or lapse of time or both) a default under any such indenture, agreement or other instrument, or result in the creation or imposition of any lien , charge or encumbrance of any nature whatsoever upon any of the properties or assets.

31. INSURANCE REQUIREMENTS

- a. The CONTRACTOR shall purchase and maintain, in a company or companies licensed to do business in the State of Tennessee, such insurance as will protect the County from claims which may arise out of or result from the CONTRACTOR's operations under the Contract, whether such operations are performed by himself or by any subcontractors or by anyone directly or indirectly employed by any of them, or by anyone for whose acts the CONTRACTOR or subcontractor may be liable.
- b. The insurance required shall be written for not less than any limits of liability specified or required by law, whichever is greater. Shelby County Government, its elected officials, appointees and employees will be named as additional insured. All policies will provide for thirty (30) days written notice to COUNTY of cancellation

or material change in coverage provided. The CONTRACTOR will maintain throughout the life of this Contract insurance, through insurers rated A or better by A.M. Best, in the following minimum requirements:

- i) Commercial General Liability Insurance- \$1,000,000.00 limit per occurrence for bodily injury and property damage/\$1,000,000.00 personal and advertising injury/\$2,000,000.00 General Aggregate/\$2,000,000.00 Products-Completed Operations Aggregate. The service provider should indicate in its bid whether the coverage is provided on a claims-made or preferably on an occurrence basis. The insurance shall include coverage for the following:
 - a) Premises/Operations
 - b) Products/Completed Operations
 - c) Personal Injury
 - d) XCU coverage, where applicable
 - e) Contractual Liability
 - f) Independent Contractors
 - g) Broad Form Property Damage
 - h) Explosion, Collapse
 - i) Personal Injury
 - ii) Business Automobile Liability Insurance - \$1,000,000.00 each accident for bodily injury and property damage. Coverage is to be provided on all:
 - a) Owned/Leased Autos
 - b) Non-owned Autos
 - c) Hired Autos
 - iii) Workers Compensation And Employers' liability Insurance – Workers Compensation statutory limits as required by Tennessee law. This policy should include Employers' Liability coverage for \$500,000.00 per accident.
 - iv) Builders Risk Insurance or Installation Floater (as applicable) – All risk coverage in the amount of the structure/equipment which is to be built or installed.
- c. CONTRACTOR shall provide County with a current copy of the Certificate of Insurance at the time of contracting and shall maintain said insurance during the entire Contract period as well as provide renewal copies on each anniversary date. The certificate holder is to read:
- Shelby County Government
Purchasing Department
160 N. Main, Suite 550
Memphis, TN 38103
- d. Upon termination or cancellation of insurance currently in effect under this Contract, the CONTRACTOR shall purchase an extended reporting endorsement and furnish evidence of same to the County.

32. NOTICE

Any notices required or permitted to be given under the provisions of this Contract shall be effective only if in writing and delivered either in person to the COUNTY's authorized agent or by First Class or U.S. Mail to the addresses set forth below, or to such other person or address as either party may designate in writing and deliver as herein provided:

COUNTY: Shelby County Government
Engineering Field Office
6463 Haley Road
Memphis, Tennessee 38134
Attn.: Mr. Chris Masin

and

Shelby County Government
Contract Administration
160 N. Main St., Suite 550
Memphis, Tennessee 38103

CONTRACTOR:

33. HIPAA

CONTRACTOR warrants to the COUNTY and State that it is familiar with the requirements of the Health Insurance Portability and Accountability Act of 1996 (HIPAA) and its accompanying regulations, and will comply with all applicable HIPAA requirements in the course of this Contract. CONTRACTOR warrants that it will cooperate with the COUNTY and State in the course of performance of the Contract so that all parties will be in compliance with HIPAA, including cooperation and coordination with COUNTY and State privacy officials and other compliance officers required by HIPAA and its regulations. CONTRACTOR will sign any documents that are reasonably necessary to keep the State and the COUNTY in compliance with HIPAA, including, but not limited to, business associate agreements.

34. ORDER OF APPLICATION OF CONTRACT AND SUPPORTING EXHIBITS

In the event of a discrepancy or conflict between the terms of this Contract, the Sealed Bid (Exhibit A), and/or the Response to the Proposal (Exhibit B), the terms of this Contract shall control followed by the Sealed Bid (Exhibit A) and, lastly, the Response to the Proposal (Exhibit B).

35. It is agreed that the following documents are made a part of and incorporated fully into this construction Contract:

- A. Performance Bond
- B. Labor and Material Bond
- C. Insurance Certificate

- D. Bid Specifications (SEALED BID #I-000170, Exhibit "A")
- E. Contractor's Bid/Proposal (Exhibit "B")
- F. List of subcontractors who will be performing work on project with attached required information (Exhibit "C").

36. PERFORMANCE AND LABOR AND MATERIALS BONDS

CONTRACTOR will provide COUNTY within ten (10) days from inception date of this Contract a Performance and Labor and Materials Bond each in the amount of 100% of the Contract price for each year that this contract is in effect. Said Bonds may be pro-rated for the initial year in the event that this period of time is less than a full twelve (12) month period.

END OF PAGE

IN WITNESS WHEREOF, the parties hereto have set their signatures for the purposes contained herein, on the day and date first above written.

**APPROVED AS TO FORM
AND LEGALITY:**

SHELBY COUNTY GOVERNMENT

Contract Administrator/
Assistant County Attorney

Mark H. Luttrell, Jr., Mayor

CONTRACTOR

BY: _____

TITLE: _____

CORPORATE ACKNOWLEDGMENT

STATE OF _____

COUNTY OF _____

Before me, the undersigned Notary Public, in and for the State and County aforesaid, personally appeared _____, with whom I am personally acquainted or proved to me on the basis of satisfactory evidence, and who, upon oath, acknowledged himself/herself to be president or other officer authorized by appropriate Corporate action and/or Resolution to execute the preceding instrument of the _____, the within named bargainor, a corporation, and that he as such _____, executed the foregoing instrument for the purpose herein contained, by signing the name of the corporation by himself/herself as _____.

Witness my hand and official seal at office this _____ day of _____, 2012.

Notary Public

CONTRACT BOND (Corporation)

KNOW ALL MEN BY THESE PRESENTS, That we _____ a corporation organized under the laws of the State of _____ and licensed to do business in the State of Tennessee, as Principal, and _____ a corporation organized and existing under the laws of the State of _____ with authority to do business in the State of Tennessee, as Surety, are held and firmly bound unto THE COUNTY OF SHELBY, TENNESSEE, in the penal sum of _____ DOLLARS (\$_____), lawful money of the United States, well and truly to be paid unto said SHELBY COUNTY, TENNESSEE, for the payment of which we bind ourselves, our successors and assigns, jointly, severally, and firmly by the presents.

THE CONDITION OF THE FOREGOING OBLIGATION IS SUCH that whereas, the said Principal has entered into a written contract with THE COUNTY OF SHELBY, TENNESSEE, for the construction of the work designated CONGESTION MITIGATION PROGRAM – PROJECT SET No.6, which contract is hereby referred to and made a part hereof, as if written herein at length, and whereby the said Principal has promised and agreed to perform to pay all sums of money due for any labor, materials, apparatus, fixtures or machinery furnished to such Principal for the purposes of performing such work and has further agreed to pay all direct and indirect damages to any person, firm, company or corporation suffered or sustained on account of the performance of such work during the time thereof and until such work is completed and accepted; and has further agreed that this bond shall insure to the benefit of any person, firm, company or corporation, to whom any money may be due from the Principal, sub-contractor or otherwise, for any such labor, materials, apparatus, fixtures or machinery so furnished and that suit may be maintained on such bond by any such person, firm company or corporation, for the recovery of any such money ON OR BEFORE THE EXPIRATION OF ANY GUARANTEE PERIOD AND/OR THE REQUIRED ADVERTISEMENT PERIOD.

NOW, THEREFORE, if the said Principal shall well and truly perform said work in accordance with the terms of said contract, and shall pay all sums of money due or to become due to any labor, materials, apparatus, fixtures or machinery furnished to him for the purpose of constructing such work, and shall commence and complete the work within the time prescribed in said contract, and shall pay and discharge all damages, direct and indirect, that may be suffered or sustained on account of such work during the time of the performance thereof and until the said work shall have been accepted and shall hold THE COUNTY OF SHELBY, TENNESSEE, harmless, its officials, agents, and employees in account of any such damages, and shall in all respects full and faithfully comply with all the provisions, conditions, and requirements of said contract, then this obligation to be void; otherwise to remain in full force and effect.

Approved this ____ day of _____,
A.D., 2012.

IN WITNESS WHEREOF, We have
duly executed the foregoing
obligation this _____ day
of _____ A.D.2012

FOR SHELBY COUNTY GOVERNMENT:

Corporate
Name: _____
President

Mayor of Shelby County, TN

Attest: _____
Secretary

Director of Public Works

BY: _____(Seal)
Attorney in Fact

BY: _____ (Seal)
Attorney in Fact

B-22

PROPOSAL
TO THE COUNTY OF SHELBY
SHELBY COUNTY, TENNESSEE

By submitting this Proposal, the undersigned bidder represents that it has carefully examined the site of the work described herein, has become familiar with local conditions and the character and extent of the work; has carefully examined the Plans, the most current version of the *Standard Specifications for Road and Bridge Construction* and the Standard Roadway and Structures Drawings adopted by the State of Tennessee, Department of Transportation, with subsequent revisions which are acknowledged to be a part of this Proposal, the Special Provisions, the Proposal Form, the Form of Contract, and the Form of Contract Payment and Performance Bond; and thoroughly understands their stipulations, requirements, and provisions.

The undersigned bidder has determined the quality and quantity of materials required; has investigated the location and determined the sources of supply of the materials required; has investigated labor conditions; and, has arranged for the continuous prosecution of the work herein described.

By submitting this Proposal, the undersigned bidder agrees to provide all necessary equipment, tools, labor, incidentals, and other means of construction, to do all the work, and furnish all the materials of the specified requirements which are necessary to complete the work in accordance with the Plans, and the Specifications, and agrees to accept as payment in full the unit prices for the various items described in the Specifications that are set forth in this Proposal. The bidder understands that the quantities of work specified are approximate only and are subject to increase or decrease and that any such increase or decrease will not affect the unit prices set forth in this Proposal. Compensation for "extra work" which may be required by **SHELBY COUNTY** in connection with the construction and completion of the work but which was not reflected in the Plans and Specifications at the time of bidding, will be made in the following manner: work for which there is a unit price set forth in this Proposal will be compensated at that unit price; work for which there is no unit price set forth in this Proposal will be compensated in accordance with the applicable Tennessee Department of Transportation Standard Specifications.

By submitting this Proposal, the undersigned bidder hereby agrees to be bound by the award of the Contract and, if awarded the Contract on this Proposal, to execute the required Contract and the required Contract Payment and Performance Bond within ten (10) days after receipt of notice of the award. The undersigned bidder submits herewith the required Proposal guaranty in an amount of not less than five percent (5%) of the total amount of the Proposal offered and agrees and consents that the Proposal guaranty shall immediately be at the disposal of **SHELBY COUNTY**, not as a penalty, but as an agreed liquidated damage if the required Contract and Contract Payment and Performance Bond are not executed within ten (10) days from receipt of the notice of award.

THIS PROPOSAL SUBMITTED BY:

Bidder (1)

By: _____

Printed Name and Title

Address

City/State/Zip

Bidder (1) being a _____ composed of officers, partners, or owners as follows:
(Type of business entity)

Name/Title

Name/Title

Name/Title

Name/Title

Name/Title

Name/Title

Bidder (2)*

By: _____

Printed Name and Title

Address

City/State/Zip

Bidder (2) being a _____ composed of officers, partners, or owners as follows:
(Type of business entity)

Name/Title

Name/Title

Name/Title

Name/Title

Name/Title

Name/Title

***NOTE: The signature and information for Bidder (2) is to be provided when there is a joint venture.**

PROPOSAL CERTIFICATION

The undersigned, being first duly sworn, certifies on behalf of the bidder that it has not, either directly or indirectly, entered into any agreement, participated in any collusion, or otherwise taken any action in restraint of free competitive bidding in connection with this Proposal or Contract. This is an official document that is required or authorized by law to be made under oath and is presented in an official proceeding. A person who makes a false statement in this certification is subject to the penalties of perjury.

The undersigned further certifies that said bidder is not under the control of any person, firm, partnership, or corporation, which has or exercises any control of any other person, firm, partnership, or corporation, which is submitting a bid on this Contract.

_____	Sworn to and subscribed before me
Bidder (1)	
	this _____ day of _____, ____.
By: _____	
_____	_____
Printed Name and Title	Notary Public
	My commission expires_____.

(Seal)

_____	Sworn to and subscribed before me
Bidder (2)	
	this _____ day of _____, ____.
By: _____	
_____	_____
Printed Name and Title	Notary Public
	My commission expires_____.

(Seal)

***NOTE: The signature and information for Bidder (2) is to be provided when there is a joint venture.**

SHELBY COUNTY
PROPOSAL BOND
CONTRACT NO. _____

Principal:

Print Name of Principal

Surety:

Print Name of Surety

KNOW ALL MEN BY THESE PRESENTS, that we, the Principal and Surety above named, are held and firmly bound unto **SHELBY COUNTY** in the full and just sum of five percent (5%) of the total amount bid by the Principal for the project stated above, for the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators, and successors, jointly and severally, firmly by these presents.

NOW, THEREFORE, the condition of this obligation is: the Principal shall not withdraw its bid within sixty (60) days after the opening of the bids, or within such other time period as may be provided in the Proposal, and if **SHELBY COUNTY** shall award a Contract to the Principal, the Principal shall, within ten (10) days after written notice of the award is received by him, fully execute a Contract on the basis of the terms, conditions and unit prices set forth in his Proposal or bid and provide bonds with good and sufficient surety, as required for the faithful performance of the Contract and for the protection of all persons supplying labor, material, and equipment for the prosecution of the work. In the event the Principal withdraws its bid after bids are opened, or after award of the Contract has been made fails to execute such the Contract and/or such additional documents as may be required and to provide the required bonds within the time period specified above, then the amount of the Proposal Bond shall be immediately paid to **SHELBY COUNTY**, not as a penalty, but as agreed upon liquidated damages.

IN WITNESS WHEREOF, the Principal has caused these presents to be signed by a duly authorized official and the Surety has caused these presents to be duly signed and sealed by an authorized agent or attorney-in-fact.

Principal (1)

Surety (1)

By: _____

By: _____
General Agent or Attorney-in-Fact

Print Name and Title

Date

Date

(Seal)

Principal (2)

By: _____

Print Name and Title

Date

Surety (2)

By: _____
General Agent or Attorney-in-Fact

Date

(Seal)

***NOTE: The signature and information for Principal (2) and Surety(2) is to be provided when there is a joint venture.**

SHELBY COUNTY

PROPOSAL GUARANTEE

CONTRACT NO. _____

Bidder: _____

Print Name of Bidder

KNOW ALL MEN BY THESE PRESENTS, that the above-named Bidder has tendered the attached cashier's or certified check in an amount equal to five percent (5%) of the total amount it bid for the project stated above, payable to **SHELBY COUNTY**, to be held pending the fulfillment of the following obligation conditions.

NOW, THEREFORE, the condition of this obligation is: the Bidder shall not withdraw its bid within sixty (60) days after the opening of the bids, or within such other time period as may be provided in the Proposal, and if **SHELBY COUNTY** shall award a Contract to the Bidder, the Bidder shall, within ten (10) days after it receives written notice of the award, fully execute a Contract on the basis of the terms, conditions and unit prices set forth in its Proposal or bid and provide bonds with good and sufficient surety, as required for the faithful performance of the Contract and for the protection of all persons supplying labor, material, and equipment for the prosecution of the work. In the event the Bidder withdraws its bid after bids are opened, or after award of the Contract has been made fails to execute such the Contract and/or such additional documents as may be required and to provide the required bonds within the time period specified above, then **SHELBY COUNTY** shall cash the attached check and retain the funds, not as a penalty, but as agreed upon liquidated damages.

IN WITNESS WHEREOF, the Bidder has caused these presents to be signed by a duly authorized official.

Bidder (1)

Bidder (2)*

By: _____

By: _____

Print Name and Title

Print Name and Title

Date

Date

***NOTE: The signature and information for Bidder(2) is to be provided when there is a joint venture.**

SHELBY COUNTY

CONTRACT NO. _____

This agreement is made and executed in three (3) originals, between **SHELBY COUNTY**, and _____ hereinafter referred to as the "Contractor."

WITNESSETH

SHELBY COUNTY did advertise for, receive and accept a bid from the Contractor for work on the above identified contract.

In consideration of the agreements herein contained, to be performed by the parties hereto and of the payments hereafter agreed to be made, it is mutually agreed by both parties that:

1. The contract between the parties consists of the following "Contract Documents" all of which constitute one instrument:
 - (a) the Instructions to Bidders
 - (b) the Proposal
 - (c) all conditions and terms of this Contract form
 - (d) the Contract Payment & Performance Bond and/or Letter of Credit, where applicable
 - (e) the most current version of the *Tennessee Department of Transportation Standard Specifications for Road and Bridge Construction* (herein referred to as *TDOT Standard Specifications*)
 - (f) Supplemental Specifications
 - (g) Revisions and Additions
 - (h) Special Provisions
 - (i) Addenda
 - (j) The most current version of the TDOT Standard Drawings
 - (k) The Contract Plans,
 - (l) The Work Order
 - (m) Construction Changes
 - (n) Supplemental Agreements

All of the provisions contained in the listed Contract Documents are incorporated herein by reference with the same force and effect as though set out in full.

2. The Contract Documents are intended to be complementary and to describe and provide for a complete work. Requirements in one of these are as binding as if occurring in all of them. In case of discrepancy, Supplemental Specifications will govern over the TDOT Standard Specifications; the TDOT Standard Specifications will govern over the local government standard specifications; the Contract Plans will govern over both Supplemental and Standard Specifications, and Special Provisions will govern over both Plans and Specifications. In interpreting Plans, calculated dimensions will govern over scaled dimensions. Contract Plans, typical cross sections and approved working drawings will govern over Standard Drawings.

3. The Contractor agrees to furnish all materials, equipment, machinery, tools and labor and to perform the work required to complete the project in a thorough and workmanlike manner, to the satisfaction of the appropriate official of **SHELBY COUNTY**.
4. **SHELBY COUNTY** agrees to pay to the Contractor such unit prices for the work actually done as are set out in the accompanying proposal, in the manner provided for in the TDOT Standard Specifications, Supplemental Specifications and applicable Special Provisions.
5. The Contractor shall, at all times, observe and comply with all applicable federal, state and local laws, ordinances and regulations and shall indemnify and hold harmless **SHELBY COUNTY** and all of its officers, agents and servants against any claim of liability or assessment of fines or penalties arising from or based upon the Contractor's and/or its employees' violations of any such law ordinance or regulation. The Contractor shall maintain documentation for all charges against **SHELBY COUNTY** under this Contract. The books, records and documents of the Contractor insofar as they relate to the work performed or money received under this contract shall be maintained for a period of three (3) full years from the date of the final payment and shall be subject to audit at any reasonable time and upon reasonable notice by **SHELBY COUNTY**, the State, the Comptroller of the Treasury, the Tennessee Department of Transportation, or their duly appointed representatives.
6. The Contractor shall be responsible for any and all injury or damage to persons or to property arising from the prosecution of the work and due to any act, omission, neglect or misconduct in its manner or method of prosecuting the work or due to its non-execution of the work or due to defective work or materials. The Contractor shall provide proof of adequate and appropriate general liability insurance providing liability coverage in an amount not less than \$1 million dollars per occurrence and \$300,000 per claimant, naming **SHELBY COUNTY** as an additional insured.
7. The Contractor shall indemnify and hold harmless **SHELBY COUNTY** and all of its officers, agents and employees from all suits, actions or claims of any character arising from the Contractor's acts or omissions in the prosecution of the work, use of unacceptable materials in constructing the work, infringement of patent, trade mark or copyright, or claims for Workers' Compensation. If any such suit, action or claim is filed, **SHELBY COUNTY** may retain from the monies due to the Contractor under this Contract a sum deemed sufficient by **SHELBY COUNTY** to protect **SHELBY COUNTY** from loss therefrom. Upon resolution of the suit, action or claim, any remaining retained funds will be released.
8. Upon execution of this Contract, the Contractor shall be prepared to begin the work to be performed under the Contract, but will not proceed until it has received official "Notice to Proceed". This official notice will stipulate the date upon which it is expected that the Contractor will begin his work, and from which date the working days tabulated against its time limit will begin. All other requirements in regard to the beginning of construction set forth in the Proposal and Special Provisions will date from the official notice.

IN WITNESS WHEREOF, the parties hereto have cause this Contract to be signed and executed by their respective authorized agents or officials.

Contractor 1

Contractor 2*

By: _____

By: _____

Printed Name and Title

Printed Name and Title

Date

Date

SHELBY COUNTY

This Contract is accepted this _____ day of _____, _____,
and is effective on the _____ day of _____, _____.

SHELBY COUNTY Official

Approved:

SHELBY COUNTY Attorney

***NOTE: The signature and information for Contractor 2 is to be provided when there is a joint venture.**

CONTRACT PAYMENT AND PERFORMANCE BOND

CONTRACT NO. _____

Be it known that _____, as Principal, and _____, as Surety(ies), all authorized to do business in the State of Tennessee, hereby bind themselves to **SHELBY COUNTY**, and other potential claimants, for all obligations incurred by the Principal under its contract with **SHELBY COUNTY**, for the construction of the above identified contract; in _____ the _____ full _____ contract _____ amount _____ of _____ (\$_____).

The obligations of the Principal and Surety(ies) under these payment and performance bonds shall continue in full force and effect until all materials, equipment and labor have been provided AND all requirements contained in the contract, plans and specifications have been completed in a timely, thorough and workmanlike manner. The parties agree that these bonds are statutory in nature and are governed by the provisions contained in Title 12, chapter 4 and Title 54, chapter 5 of the Tennessee Code Annotated relating to bonds required of contractors and that those provisions constitute a part of this bond.

By this instrument, the Principal and Surety(ies) specifically bind themselves, their heirs, successors, and assigns, *in solido*, under the following bonds:

Payment Bond. To **SHELBY COUNTY** and all "Claimants," as contemplated by T.C.A. Title 54, chapter 5, in the full contract amount of _____

_____ (\$_____), in order to secure the payment in full of all timely claims under the project.

Performance Bond. To **SHELBY COUNTY** in the full contract amount of _____

_____ (\$_____), in order to secure the full and faithful performance and timely completion of the project according to its plans and specifications, inclusive of overpayments to the contractor and liquidated damages as assessed.

Upon receipt of notice that the Principal is in default under the contract, the Surety(ies) shall undertake to complete performance, without regard to cost. If the Surety(ies) fail or refuse to complete performance of the contract, the **SHELBY COUNTY** may then proceed with the work in any lawful manner that it may elect until it is finally completed. When the work is thus finally completed, the total cost of the same will be computed. All costs and charges incurred by the **SHELBY COUNTY** in completing the Work will be deducted from any monies due or which may become due to the Principal. If the total costs of completion exceeds the sum which would have

been payable under the Contract, then the Principal and the Surety(ies), *in solido*, shall be liable for and shall pay to the **SHELBY COUNTY** the amount of such excess.

In witness whereof we have signed this instrument as dated.

Principal/Contractor 1 _____

By: _____

Date _____

Printed Name and Title

(For Joint Venture)

Principal/Contractor 2 _____

By: _____

Date _____

Printed Name and Title

Surety 1 _____

Surety 2 _____

By: _____

By: _____

Attorney-in-Fact

Attorney-in-Fact

Printed Name

Printed Name

Agency Name

Agency Name

Street Address

Street Address

City/State/Zip

City/State/Zip

(Seal)

(Seal)

Subsequent correspondence/communication from **SHELBY COUNTY** with respect to monthly progress reports and/or the contract bonds should be directed to:

For Surety 1:

Name

Address

City

State/Zip

Phone Number

Fax Number

For Surety 2:

Name

Address

City

State/Zip

Phone Number

Fax Number

SECTION C-1

SHELBY COUNTY GOVERNMENT

ENGINEERING DEPARTMENT

SPECIAL PROVISIONS

T A B L E O F C O N T E N T S

Supplemental Specifications to The Standard Specifications	Revision Date
Supplemental Specification to Section 100-----	10/31/11
Supplemental Specification to Section 200-----	05/05/10
Supplemental Specification to Section 300-----	01/05/10
Supplemental Specification to Section 400-----	02/13/12
Supplemental Specification to Section 500-----	12/13/10
Supplemental Specification to Section 600-----	05/09/11
Supplemental Specification to Section 700-----	12/13/10
Supplemental Specification to Section 800-----	05/05/10
Supplemental Specification to Section 900-----	12/13/12

The above Supplemental Specifications, revised as noted, are incorporated by reference for bidding purposes and will be printed with the contract after awards. These Supplemental Specifications may be obtained from the Department at Suite 700, James K. Polk Bldg., Nashville, Tennessee or viewed on the Department's website at <http://www.tdot.state.tn.us/construction>.

Special Provision Regarding:	Special Provision No.	Revision Date
Unbalanced Bids	102 B	
Employing and Contracting with Illegal Immigrants	102 I	02/05/07
Approval of Shop Drawings	105 A	
Pre-Construction Submittal Requirement	105.05	
Schedule of Work	105.06	
Damage to Service Lines	105.07A	
Control of Work Construction Stakes, Lines and Grades	105.09	
Buy American Requirements	106 A	06/20/11
Water Quality and Storm Water Permits	107 FP	02/13/12
Complaints	107.15	
Specialty Items	108 A	
Highway Signs, Luminaries, and Traffic Signals	700 SIG	02/03/07
Equal Opportunity Employment	1230	
Standard Federal Equal Opportunity Employment Construction Contract Specifications (Executive Order 11246)	1231	
Requirement of Affirmative Action to Ensure Equal Employment Opportunity (Executive Order 11246)	1232	
Disadvantage Business Enterprise Participation	1246	11/10/08
DBE Contract Goal	1247	09/17/11
Required Contract Provisions (Federal-Aid Construction Contracts)	1273	03/10/94
Certification Regarding Debarment, Suspension, and other Responsibility Matters Primary and Lower Tier Covered Transactions	1275	
Non-Discrimination in Employment	1290	

Tennessee Department of Transportation Minimum Wage Scales for
Federal-Aid Construction and State Funded Construction
Federal Wage Rates
State Wage Rates

1320

01/11/12

Records Retention, Procurement and Auditing
FHWA Part 635.106 – Use of publicly owned equipment
FHWA Part 635.109 – Standardized changed condition clauses
FHWA Part 635.119 – False statements
FHWA Part 635.125 – Termination of contract
FHWA Part 635.127 – Agreement provisions regarding overruns in contract time
FHWA Part 635.407 – Use of materials made available by a public agency
FHWA Part 635.410 – Buy America requirements

A T T E N T I O N

It shall be the bidders' responsibility to confirm that the Contract Proposal contains all the documents indicated on the Table of Contents.

Should any omissions occur, the appropriate documents may be obtained from the Shelby County Government, upon request.

S T A T E

O F

T E N N E S S E E

March 1, 2006

SPECIAL PROVISION

REGARDING

UNBALANCED BIDS

The Department will review all unit prices submitted by the apparently lowest responsible bidder and will decide whether any of the unit prices are excessively above or below a reasonable cost analysis value determined by the Engineer.

In the event any unit prices are determined to be unbalanced and contrary to the interest of the Department, the right is reserved to reject such bid at the discretion of the Department or to award the Contract and limit progress payments on units of work performed on any excessively priced items to costs that are satisfactorily documented by the Contractor plus 20 percent, until 85 percent of the Contract has been completed. Upon completion of 85 percent of the Contract, the Contractor will be reimbursed in accordance with **Subsection 109.06** of the Standard Specifications for the accepted quantities of work performed on the excessively priced items.

S T A T E**O F****T E N N E S S E E**

October 1, 2006

REV: February 5, 2007

SPECIAL PROVISION**REGARDING****EMPLOYING AND CONTRACTING WITH ILLEGAL IMMIGRANTS**

The State shall endeavor to do business only with those contractors and subcontractors that are in compliance with the Federal Immigration and Nationality Act. This policy shall apply to all State Contractors including subcontractors. This policy statement is issued to establish implementation guidance to procuring state agencies and contractors reflecting the requirements of Governor's Executive Order #41, An Order Regarding Compliance with Federal and State Laws Related to Employing and Contracting with Illegal Immigrants, and the requirements of Public Acts of 2006, Chapter Number 878 of the State of Tennessee (codified at *Tennessee Code Annotated*, Title 12, Chapter 4, Part 1).

1. The Contractor hereby attests, certifies, warrants, and assures that the Contractor shall not knowingly utilize the services of an illegal immigrant in the performance of this Contract and shall not knowingly utilize the services of any subcontractor who will utilize the services of an illegal immigrant in the performance of this Contract. The Contractor shall reaffirm this attestation, in writing, by submitting to the State a completed and signed copy of the "Attestation form" provided by the Department, semi-annually during the period of this Contract.
2. Prior to the use of any subcontractor in the performance of this Contract, and semi-annually thereafter, during the period of this Contract, the Contractor shall obtain and retain a current, written attestation that the subcontractor shall not knowingly utilize the services of an illegal immigrant to perform work relative to this Contract and shall not knowingly utilize the services of any subcontractor who will utilize the services of an illegal immigrant to perform work relative to this Contract.
3. The Contractor shall maintain records for its employees used in the performance of this Contract. Said records shall include a completed federal Department of Homeland Security Form I-9, *Employment Eligibility Verification*, for each employee and shall be subject to review and random inspection at any reasonable time upon reasonable notice by the State.

4. The Contractor understands and agrees that failure to comply with this section will be subject to the sanctions of Public Chapter 878 of 2006 for acts or omissions occurring after its effective date. This law requires the Commissioner of Finance and Administration to prohibit a contractor from contracting with, or submitting an offer, proposal, or bid to contract with the State of Tennessee to supply goods or services for a period of one year after a contractor is discovered to have knowingly used the services of illegal immigrants during the performance of this contract.

For the Purposes of this policy, “illegal immigrant” shall be defined as a non-citizen who has entered the United State of America without federal government permission or stayed in this country beyond the period allowed by a federal government-issued visa authorizing the non-citizen to enter the country for specific purposes and a particular time period.

Compliance and non-compliance procedures will be as specified in the Tennessee Department of Finance and Administration’s Policy on “Ensuring Compliance with Federal Immigration Laws by State Contractors and Subcontractors”.

SHELBY COUNTY, TENNESSEE
SPECIAL PROVISION #105A
APPROVAL OF SHOP DRAWINGS

As soon as possible after naming the fabricator of a steel structure and before the shop drawings are prepared, the Contractor shall require the fabricator to submit prints of the shop drawing Title Sheet directly to the Shelby County Engineering Department. Shop drawings for all types of structures shall be submitted directly to the Engineering Department for handling with the checking agency and for distribution. A copy of the letter transmitting the shop drawings to the Engineering Department shall be furnished the project engineer.

Each shop drawing sheet shall contain in the title block the following:

The location, project number, and contract number. Shop drawings shall be submitted in sets with the drawing numbers running consecutively in each set, and if more than five (5) sheets in a set, shall be appropriately bound. Shop drawings marked "APPROVED" or "APPROVED AS NOTED" need not be resubmitted unless specifically asked for. The following minimum number of sets of shop drawings shall be submitted for approval.

Strain Poles and Mast Arm Poles - six (6) sets; Conventional Street Lighting Poles - six (6) sets.

It is recommended that a heading similar to the following be used in all correspondence:

Project Number

Location

Contract Number

SHELBY COUNTY, TENNESSEE
SPECIAL PROVISION 105.05
PRE-CONSTRUCTION SUBMITTAL REQUIREMENT

The Contractor shall be responsible for submitting asphalt mix design(s), concrete mix design(s), shop drawing(s), certification report(s), etc. for approval at the preconstruction conference or no later than thirty (30) days after the preconstruction conference. This is to allow sufficient time for review and approval.

Under no circumstances shall any materials be used or construction begin using any mix design or shop drawing prior to approval of submittals.

CONCRETE PLANTS, ASPHALT PLANTS, CEMENT TREATED BASE PLANTS, ETC.:

Regarding mix design submittal(s): The Contractor shall designate the plant location for the item(s) to be produced as per the mix design. The designated location shall not be changed by the Contractor without prior approval of Shelby County. The Contractor shall not be permitted to send any item(s) to the project without this approval. Any approved change(s) in plant location(s) shall require a mix design for that specific location. Any change(s) shall have prior approval and the approved design shall be on file with Shelby County per the requirements for the item(s) being produced per the mix design. Contractor(s) shall not change plant locations at will. Any change(s) shall only be made for an emergency type situation or with prior approval and a notification that such change is to take place. Convenience or poor planning shall not constitute being a valid reason for plant change(s). It shall be the Contractor's responsibility for coordinating the project work with the item(s) being produced and shipped.

REGARDING PROCESS CONTROL PLAN(S):

The Contractor shall submit a process control plan, with mix design submittals, which shall be approved by the Engineer. This process control plan shall be used by the Contractor per the specification requirements of the item being produced or supplied. This plan shall not be changed or otherwise altered without submittal and approval of a "new" plan.

SHELBY COUNTY, TENNESSEE
SPECIAL PROVISIONS 105.06
SCHEDULE OF WORK

The Contractor shall, in coordination with the Engineer, develop a proposed work schedule showing estimated work times for all major construction tasks. The schedule shall be updated as needed to afford the Engineer a view as to the progress and completion time. This schedule shall be submitted at the pre-construction conference and shall include a list of suppliers.

The Contractor shall follow this schedule unless a change is necessary. The Contractor shall notify the Engineer in advance of any deviation from this schedule. The plan of operations shall show the controlling item of work during each phase and a revised schedule shall be submitted when changed conditions warrant.

Sub-contractor notification: The successful Contractor shall submit to the Engineer at the pre-construction conference a list of any and all sub-contractor(s) that will be performing work under his supervision. The contractor shall also notify the Engineer before any change is made in sub-contractor(s) or suppliers of materials to the project.

Notification of sub-contractor(s) or suppliers shall in no way release the Contractor from any or all responsibility relating to work or liabilities relating to this contract.

SHELBY COUNTY, TENNESSEE
SPECIAL PROVISION 105.07A
DAMAGE TO SERVICE LINES

The Contractor shall immediately stop all work to repair any service lines that are damaged during construction. The construction process shall not commence until the damaged lines are satisfactorily repaired and the repair approved by the Engineer or his representative.

The Contractor shall also be responsible for any plumbing damage caused by foreign objects entering a broken water line.

The Contractor shall also be responsible for other damage caused by broken service lines including, but not limited to, damage to equipment due to interrupted service. This does not apply to cable television deemed by the Engineer to have been incorrectly installed.

SHELBY COUNTY, TENNESSEE
SPECIAL PROVISION #105.09
CONTROL OF WORK
CONSTRUCTION STAKES, LINES AND GRADES

In the context of this Special Provision, the word "Engineer" is used to mean The Shelby County Engineer or a duly assigned designee.

The word "**Department**" is used to mean The Shelby County Engineering Department or its assigned designee. The Contractor shall be required to make all calculations involved and to furnish and place all layout stakes, including those required for the location of public utility service lines (waterlines, sewer lines, gas lines, etc.) utility fixtures and right-of-way, as shown on the plans or as directed by the Engineer.

The Contractor shall be responsible for the placement and preservation of adequate ties to all control points, whether established by the Contractor or found on the project, which are necessary for the accurate re-establishment of all base lines or center lines shown on the plans. The contractor shall also be required to provide ROW or slope stakes, ditch or stream bed grades, or other essential survey staking as directed by the Engineer.

Dimensional details, including elevations, shown on the plans shall be checked by the Contractor to assure accuracy of the required layout. Any errors and apparent discrepancies found in previous surveys, or in either the specifications or the special provisions, shall be called to the Engineer's attention by the Contractor for correction or interpretation prior to proceeding with the work. All stakes, references and batter boards, including original, additional or replacement, which may be required for the construction operations, shall be furnished, set and properly referenced by the Contractor. The Contractor shall be solely and completely responsible for the accuracy of the line and grade of all features of the work.

The County reserves to itself the responsibility for making all measurements and surveys that involve the determination of final pay quantities, including original and final cross-sections for all earthwork.

The Contractor shall furnish to the Engineer copies of all data used in establishing line and grade for all features of work, including, but not limited to, the data used in setting and referencing all stakes and layout marking used by the Contractor.

When requested by the Engineer, the Contractor shall provide safe facilities for convenient access by the Department forces to control points, batter boards and references.

All staking shall be performed by qualified engineering or surveying personnel who are trained, experienced and skilled in construction layout and staking of the type required under the contract and who are acceptable to the Engineer. The personnel shall perform this staking under the direct supervision of a Tennessee licensed professional engineer, of engineering background experienced in the direction of such work and acceptable to the Engineer. A certified listing of all personnel used in the performance of the lines and grades on the project shall be submitted to the Engineer before any staking commences.

The Contractor shall not engage the services of any person or persons who are or have been, during the period of the contract, in the employment of the Shelby County Engineer's Office (except regularly retired employees) without the written consent of the Engineer. In addition, the Contractor shall not engage the services of any firm or any principal officer or employee of a firm that participated in the development of the design of the project to be constructed under this contract.

The Engineer may check the control of work, as established by the Contractor, at any time during the progress of the work. The Contractor will be informed of the results of these checks, but the County, by so doing, in no way relieves the Contractor of responsibility for the accuracy of the layout work. The Contractor shall correct or

replace, as required, any deficient layout and construction work which may be the result of inaccuracies in layout operations or of failure to report inaccuracies in layout operations or failure to report inaccuracies found in work done by the Department or by others. If, as a result of these inaccuracies, the Department is required to make further studies, redesign, or both, all expenses incurred by the Department due to such inaccuracies may be deducted from any monies due the Contractor.

The Contractor shall furnish all necessary personnel, engineering equipment and supplies, materials, transportation, and work incidental to the accurate and satisfactory completion of this work.

Basis of Payment

No separate payment will be made for these services. The costs of these services are to be included in the cost of other items contained within the bid.

STATE**OF****TENNESSEE**

(Rev. 6-19-95)

March 1, 2006

(Rev. 6-1-04)

(Rev. 06-20-2011)

SPECIAL PROVISION**REGARDING****BUY AMERICA REQUIREMENTS**

All manufacturing processes for iron and steel products, and coatings applied thereon, used in this project shall occur in the United States except that if the proposal has bid items for furnishing domestic and foreign iron and steel, the bidder will have the option of (1) submitting a bid for furnishing domestic iron and steel, or (2) submitting a bid for furnishing domestic iron and steel and a bid for furnishing foreign iron and steel. If option (2) is chosen the bid will be tabulated on the basis of (a) the total bid price using the bid price for furnishing domestic iron and steel and, (b) the total bid price using the bid price for furnishing foreign iron and steel.

For the total bid based on furnishing foreign iron and steel to be considered for award, the lowest total bid based on furnishing domestic iron and steel must exceed the lowest total bid based on furnishing foreign iron and steel by more than 25 percent. The 25 percent differential applies to the total bid for the entire project, not just the bid prices for the steel or iron products.

Iron and steel products are defined as products rolled, formed, shaped, drawn, extruded, forged, cast, fabricated or otherwise similarly processed from iron and steel made in the United States. Iron products are included, however, pig iron and processed, pelletized, and reduced iron ore may be purchased outside the United States.

Manufacturing begins with initial melting and continues through the coating stage. Any process which modifies chemical content, physical size or shape, or the final finish is considered a manufacturing process. Coatings include epoxy, galvanizing, painting or any other surface protection that enhances the value and/or durability of a material.

The contractor shall provide a certification to the Engineer with each shipment of iron and steel products to the project site that the manufacturing processes for the iron and steel products occurred in the United States. No steel shall be placed until the contractor ensures the requirements of this Special Provision are met.

The above requirements do not prevent a minimal use of foreign materials, if the cost of such materials used does not exceed 0.1 percent of the total contract cost or \$2,500.00, whichever is greater. If steel not meeting the requirements of this Special Provision is used, the contractor

shall provide a written statement to the Department prior to its use indicating where the steel will be incorporated in the work, the value of the steel, the percentage of the contract amount, and the appropriate invoices shall be submitted as documentation.

The contractor shall be responsible for all cost associated with any steel that is permanently incorporated into the project that does not meet the requirements of this Special Provision without prior written approval from the Department, up to and including removal and replacement.

S T A T E

Rev. 04-03-2006

Rev. 11-22-2011

Rev. 02-13-2012

O F**T E N N E S S E E**

March 1, 2006

SPECIAL PROVISION**REGARDING****WATER QUALITY AND STORM WATER PERMITS****Scope**

The conditions of this Special Provision apply to all construction on this project pursuant to the following:

1. Section 404 of the Federal Clean Water Act (33 U.S.C. §1344), and all implementing regulations, including without limitation regulations of the U.S. Army Corps of Engineers governing permits for discharges of dredged or fill material into waters of the United States in 33 CFR Part 323; and
2. The Tennessee Water Quality Control Act (T.C.A. §69-3-101, et seq.) and all implementing regulations, including without limitation the Rules of the Tennessee Department of Environment and Conservation governing NPDES permits in Chapter 1200-4-10, and Aquatic Resource Alteration permits in Chapter 1200-4-7; and
3. Section 26a of the TVA Act of 1933 as amended (49 Stat. 1079, 16 U. S. C. sec. 831y1.) and all implementing regulations, including without limitation the regulations of the Tennessee Valley Authority governing construction in the Tennessee River System in 18 C.F.R., Part 1304; and
4. The Tennessee Wildlife Resources Agency Reelfoot Lake Watershed Management permit program (T.C.A. section 70-5-1.), and all implementing regulations, including without limitation regulations authorizing any activity, practice, or project which has or is likely to have the effect of diverting surface or subsurface water from the Lake or have the effect of draining or otherwise removing water from Reelfoot Lake; and
5. Coast Guard Bridge Permit (USCG) (Section 9 of the Rivers and Harbors Appropriation Act of 1899) and all implementing regulations, including but not without limitation for projects which impact streams deemed navigable by the U.S. Coast Guard.

Responsibility

It is understood and agreed that the Contractor assumes all responsibilities of the permittee as indicated in the permit that relates to protection of the "waters of the United States" and/or "waters of the State of Tennessee."

It is also understood and agreed that the Contractor shall be responsible for obtaining any additional permits required by the Contractor's method of construction, including without limitation haul roads, temporary channels or temporary ditches, or off-site waste and/or borrow areas.

It is also understood that the Contractor shall be responsible for implementing the provisions of the Water Quality (including, but not limited to, TDEC ARAP, USACE 404, TVA Section 26a, Coast Guard, TWRA) and Storm Water [including, but not limited to, National Pollution Discharge Elimination System (NPDES), Statewide Stormwater Management Plan (SSWMP)] Permits and requirements that pertain to construction activities.

The Contractor by signing this contract is indicating that the Contractor has reviewed a copy of the permit provisions, including NPDES Permit provisions at <http://www.tdot.state.tn.us/construction/permits/npdes.pdf>, the site specific SWPPP, the contract plans, Standard Specifications and contract Special Provisions and finds the permit requirements and erosion prevention and sediment control (EPSC) procedures to be reasonable, workable, and binding.

It is also understood that the Contractor shall not be released from the project site responsibilities under the NPDES permit provisions until the Notice of Termination (NOT) is submitted to TDEC by the TDOT Regional Construction Supervisor. The NOT is a certification that the construction project site is permanently stabilized and that all construction related discharges have ceased. This means that the use of EPSC measures to alleviate concerns of surface erosion and transport of sediment to surface water conveyances or to waters of the state is no longer necessary. Furthermore, it means that permanent controls, hard surfaces and/or vegetation, employed at the site are deemed adequate to prevent erosion and sediment transport and no other potential sources of construction-related pollution are on the project.

It is also understood that the Contractor shall not be released from any warranty provided for EPSC plantings, including sod and trees. If the entire project is complete as outlined in **Subsection 105.15** of the **Standard Specifications**, the Contractor shall be required to supply a performance bond as outlined in **Subsection 802.15** of the **Standard Specifications** to cover any warranty for EPSC plantings.

NPDES Permit Required Action

The Contractor (or their representative) shall accompany the EPSC inspector (TDOT personnel or TDOT hired consultant) on all EPSC inspections of the entire construction project including permitted locations and potentially impacted streams as well as attend all QA/QC Project Assessments.

EPSC Inspections shall be conducted as required in the most current TN Construction General Permit.

EPSC inspections shall be performed on the schedule established in the TN Construction General Permit until the site is permanently stabilized to determine if the permit requirements are being met. Where sites or portion(s) of construction sites have been temporarily stabilized, or runoff is unlikely due to winter conditions (e.g. site covered with snow or ice), such inspection only has to be conducted once per month until thawing or precipitation results in runoff or construction activity resumes. Written notification of the intent to change the inspection frequency and the justification for such request must be submitted to the TDOT Project Supervisor and the TDEC Central Office before proceeding.

An individual representing the Contractor, who holds a current TDEC “*Fundamentals of Erosion Prevention and Sediment Control Level I*” certification shall accompany the EPSC inspector on all required EPSC inspections. The Contractors project supervisor(s) shall also hold a current TDEC “*Fundamentals of Erosion Prevention and Sediment Control Level I*”

certification. Proof of required personnel training for the individual(s) shall be provided to the TDOT Project Supervisor prior to beginning of construction.

The TDOT EPSC inspector shall document all deficiencies on the required TDOT EPSC Inspection Report form (provided in the SWPPP). The Contractor (or their representative) shall sign the TDOT EPSC Inspection Report form and any supporting documentation indicating that he is in agreement with the report, recommendations and repair schedule as stated within the documentation.

Additionally, the Contractor shall make necessary maintenance and repairs relative to deficiencies in these permit conditions or requirements within twenty-four (24) hours after an inspection identifies the maintenance or repair need, and/or when directed to do so by the TDOT Project Supervisor, unless conditions make a particular activity impracticable. Any such conditions that make immediate repairs impracticable shall be documented and provided to the TDOT Project Supervisor, via the inspection report, and be accompanied by an expected repair schedule based on forecasted weather conditions.

The Contractor further agrees that he will execute two (2) copies of the Notice of Intent (NOI) form of the permit (provided by the Department), indicating his acceptance of the stipulations contained therein. The Contractor further agrees, that should he fail to execute said copies and return them to the TDOT Construction Division within ten (10) calendar days after submittal of the contract proposal to him, that the Department may at its discretion cancel the award with the Contractor forfeiting his bid bond.

Further, the Contractor agrees to review the site specific Stormwater Pollution Prevention Plan (SWPPP) that will be made available prior to or at the pre-construction conference, for any additional EPSC requirements. The Contractor shall sign and submit two copies of the SWPPP signature page (provided by the Department within the site specific SWPPP). The Contractor may submit for review and approval changes/revisions to the SWPPP to better prevent erosion and sediment transport at any time after contract execution. Rejection of any submittals does not relieve the contractor of any liability for appropriate Best Management Practices (BMPs).

If at any time during this contract, the requirements for the Water Quality Permits and/or the Storm Water Permits for Construction Related Activities are changed/revised/updated, the Contractor shall be notified in writing by the Department of such requirements. The Contractor shall comply with the new requirements within thirty (30) days of the Department notification.

If at any time the Contractor becomes aware that sedimentation is occurring or has occurred in streams impacted by the specified project, the Contractor shall immediately notify the TDOT Project Supervisor to evaluate the EPSC measures employed. A determination of the cause for sedimentation will be made by the Department. The Contractor shall immediately repair or replace defective EPSC measures, and install, as applicable, additional or other EPSC measures with the goal of eliminating future sedimentation. Once a remediation plan is provided by the Department, the Contractor shall, within twenty-four (24) hours after notification, begin the remediation as required. Based on the cause of sedimentation, the Department will determine if the cost of remediation will be performed at the Contractor's expense.

Failure to Comply

In the event a Notice of Violation (NOV) or Order pursuant to the Tennessee Water Quality Control Act or the Federal Clean Water Act is issued on this project, any and all fines will be the sole responsibility of the Contractor as outlined in **Subsection 107.01 of the Standard Specifications for Road and Bridge Construction.**

Failure of the Contractor to comply with this Special Provision or take immediate corrective actions required within twenty-four (24) hours (unless documented conditions make a particular maintenance or repair activity impracticable immediately) shall be reason for the TDOT Project Supervisor to suspend all other work on the Project, except erosion prevention and sediment control (EPSC) and traffic control, applying non-refundable deductions of monies from the Contract per calendar day from monies due to the Contractor for any EPSC work on the Project. This deduction can be made for each location, as determined by the TDOT Project Supervisor, for each calendar day that the deficiency is allowed to remain and charged as item description "*Failure to Comply with Permit Deduction*". A deduction shall be made from monies due the Contractor, not as a penalty, but as liquidated damages, as indicated in **Subsection 108.07** of the **Standard Specifications for Road and Bridge Construction March 1, 2006**, as amended.

If the Contractor does not make necessary corrections/adjustments in a timely manner as required above, the Department will implement the provisions of **Subsection 209.07 and Subsection 109.08** of the **Standard Specifications for Road and Bridge Construction** that provides for the Department making repairs and recovering the costs thereof from the Contractor.

The Department will not participate in any payment or reimbursement for fines and will not authorize time extensions due to delays in project progress for work stoppage, to remedy the violations stated within the NOV, required by the TDOT Project Supervisor as stated in **Subsection 105.01** of the **Standard Specifications for Road and Bridge Construction**.

SHELBY COUNTY, TENNESSEE
SPECIAL PROVISION 107.15
COMPLAINTS

The Contractor shall ensure that all complaints are resolved promptly. Upon notification by the Engineer or his representative, the Contractor shall respond immediately to correct the problem, regardless of severity.

The Contractor shall inform the Engineer in writing as to when and how the complaint was resolved.

If any complaint is not resolved to the satisfaction of the Engineer within 48 hours of receipt of the complaint by the Contractor, then all other work shall cease upon order of the Engineer or his representative until the complaint is resolved to the satisfaction of the Engineer.

It will be the Engineer's responsibility to handle all communication with private property owners and residents.

The Engineer will have the authority to schedule a conference involving the Contractor, the property owner, and the Engineer for the purpose of clarifying the nature of the complaint.

The Engineer will mediate all disputes and his decision will be final. Under no circumstances shall the Contractor negotiate directly with a property owner.

STATE OF TENNESSEE
SPECIAL PROVISION 108A
SPECIALTY ITEMS

In accordance with the provisions of Subsection 108.01, Standard Specifications for Road and Bridge Construction, 2006, all construction items included in the following described work are hereby designated as "Specialty Items:"

All bid items beginning with the numbers "730" are considered Specialty Items as defined in Special Provision 1320, Part 635 Construction and Maintenance.

STATE**OF****TENNESSEE**

(Rev. 02-03-07)

March 1, 2006

SPECIAL PROVISION**REGARDING****HIGHWAY SIGNS, LUMINAIRES, AND TRAFFIC SIGNALS****Scope:**

The design requirements of this Special Provision shall apply to Section 713-Highway Signing, Section 714-Roadway and Structure Lighting, and Section 730-Traffic Signals of the Standard Specifications for Road and Bridge Construction, March 1, 2006.

Description:

The design of the supports for overhead sign bridges, cantilever and butterfly configurations, high mast lighting, luminaires and traffic signals shall be in accordance with the American Association of Highway and Transportation Officials (AASHTO) Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals, current edition, with addenda.

General Conditions:

All overhead sign bridge, cantilever and butterfly sign structures, traffic signal mast arm structures and high mast light poles, as well as any luminaire poles 90-ft or greater in height, shall be designed using the Fatigue Category 1 provisions found in the subject specifications except that, design for galloping-induced fatigue, is excluded. Fatigue designs are not required for luminaire poles less than 90-ft in height, span-wire poles or roadside sign poles.

In lieu of designing for galloping-induced fatigue in mast arm pole assemblies, a 60-inch by 16-inch by 0.125 gauge aluminum or galvanized steel panel shall be installed near the end of the mast arm with the long axis of the panel collinear with the long axis of the mast. The panel shall be mounted at such a height as to provide a least a 6-inch clearance from the top of the signal assembly or sign blank located on the mast arm within the length of the anti-galloping panel. The panel and attachment hardware shall be shown on the shop drawings, and is considered an item included in the price bid for the mast arm assembly.

Additionally, all mast arm connections to the support pole shall be accomplished using a wrap-around ring stiffener assembly.

The following design coordinating instructions are as follows:

- The Basic Wind Speed shall be 90 mph.
- The Design Life/Recurrence Interval shall be 50-years.
- The speed for calculating Truck-induced gust loads shall be 65 mph.

S T A T E**O F****T E N N E S S E E**

March 1, 2006

SPECIAL PROVISION**REGARDING****EQUAL EMPLOYMENT OPPORTUNITY**

Reference:

Federal-Aid Highway Program Manual

Transmittal 147, June 26, 1975

Replaces FHWA Order Interim 7-2(1)

Specific Equal Employment Opportunity Responsibilities**GENERAL**

- a) Equal employment opportunity requirements not to discriminate and to take affirmative action to assure equal employment opportunity as required by Executive Order 11246 and Executive Order 11375 are set forth in Required Contract Provisions (Form FHWA-1273 or PR-1316, as appropriate) and these Special Provisions which are imposed pursuant to Section 140 of Title 23, U.S.C., as established by Section 22 of the Federal-Aid Highway Act of 1968. The requirements set forth in these Special Provisions shall constitute the specific affirmative action requirements for project activities under this contract and supplement the equal employment opportunity requirements set forth in the Required Contract Provisions.
- b) The contractor will work with the Tennessee Department of Transportation and the Federal Government in carrying out equal employment opportunity obligations and in their review of his/her activities under the contract.
- c) The contractor and all his/her subcontractors holding subcontracts not including material suppliers, exceeding \$10,000, will comply with the following minimum specific requirement activities of equal employment opportunity: (The equal employment opportunity requirements of Executive Order 11246, as set forth in Volume 6, Chapter 4, Section 1, Subsection 1 of the Federal-Aid Highway Program Manual, are applicable to material suppliers as well as contractors and subcontractors). The contractor will include these requirements in every subcontract exceeding \$10,000 with such modification of language as is necessary to make them binding on the subcontractor.

Equal Employment Opportunity Policy

The contractor will accept as his operating policy the following statement which is designed to further the provision of equal employment opportunity to all persons without regard to their age, race, color, religion, sex, national origin or disability and to promote the full realization of equal employment opportunity through a positive continuing program:

It is the policy of this Company to assure that applicants are employed, and that employees are treated during employment opportunity officer (hereinafter referred to as the EEO Officer) who will have the responsibility for and must be capable of effectively administering and promoting an active contractor program of equal employment opportunity and who must be assigned adequate authority and responsibility to do so.

Equal Employment Opportunity Officer

The contractor will designate and make known to the Tennessee Department of Transportation contracting officers an equal employment opportunity officer (hereinafter referred to as the EEO Officer) who will have the responsibility for and must be capable of effectively administering and promoting an active contractor program of equal employment opportunity and who must be assigned adequate authority and responsibility to do so.

Dissemination of Policy

- (a) All members of the contractor's staff who are authorized to hire, supervise, promote, and discharge employees, or who recommend such action, or who are substantially involved in such action, will be made fully cognizant of, and will implement, the contractor's equal employment opportunity policy and contractual responsibilities to provide equal employment opportunity in each grade and classification of employment. To ensure that the above agreement will be met, the following actions will be taken as a minimum:
 - (1) Periodic meetings of supervisory and personnel office employees will be conducted before the start of work and then not less often than once every six months, at which time the contractor's equal employment opportunity policy and its implementation will be reviewed and explained. The meetings will be conducted by the EEO Officer or other knowledgeable company official.
 - (2) All new supervisory or personnel office employees will be given a thorough indoctrination by the EEO Officer or other knowledgeable company official covering all major aspects of the contractor's equal employment opportunity obligations within thirty days following their reporting for duty with the contractor.
 - (3) All personnel who are engaged in direct recruitment for the project will be instructed by the EEO Officer or appropriate company official in the contractor's procedures for locating and hiring minority group employees.

- (b) In order to make the contractor's equal employment opportunity policy known to all employees, prospective employees and potential sources of employees, i.e., schools, employment agencies, labor unions (where appropriate), college placement officers, etc., the contractor will take the following actions:
 - (1) Notices and posters setting forth the contractor's equal employment opportunity policy will be placed in areas readily accessible to employees, applicants for employment and potential employees.
 - (2) The contractor's equal employment opportunity policy and the procedures to implement such policy will be brought to the attention of employees by means of meetings, employee handbooks, or other appropriate means.

Recruitment

- (a) When advertising for employees, the contractor will include in all advertisements for employees the notation: "An Equal Opportunity Employer." All such advertisements will be published in newspapers or other publications having a large circulation among minority groups in the area from which the project work force would normally be derived.
- (b) The contractor will, unless precluded by a valid bargaining agreement, conduct systematic and direct recruitment through public and private employee referral sources likely to yield qualified minority group applicants, including, but not limited to, State employment agencies, schools, colleges and minority group organizations. To meet this requirement, the contractor will, through his EEO Officer, identify sources of potential minority group employees, and establish with such identified sources procedures whereby minority group applicants may be referred to the contractor for employment consideration.
- (c) In the event the contractor has a valid bargaining agreement providing for exclusive hiring hall referrals, he is expected to observe the provisions of that agreement to the extent that the system permits the contractor's compliance with equal employment opportunity contract provisions. (The U.S. Department of Labor has held that where implementation of such agreements have the effect of discriminating against minorities or women, or obligates the contractor to do the same, such implementation violates Executive Order 11246, as amended).
- (d) The contractor will encourage his present employees to refer minority group applicants for employment by posting appropriate notices or bulletins in areas accessible to all such employees. In addition, information and procedures with regard to referring minority group applicants will be discussed with employees.

Personnel Actions

Wages, working conditions, and employee benefits shall be established and administered, and personnel actions of every type, including hiring, upgrading, promotion, transfer, demotion, layoff, and termination, shall be taken without regard to age, race, color, religion, sex, national origin or disability. The following procedures shall be followed:

- (a) The contractor will conduct periodic inspections of project sites to insure that working conditions and employee facilities do not indicate discriminatory treatment of project site personnel.
- (b) The contractor will periodically evaluate the spread of wages paid within each classification to determine any evidence of discriminatory wage practices.
- (c) The contractor will periodically review selected personnel actions in depth to determine whether there is evidence of discrimination. Where evidence is found, the contractor will promptly take corrective action. If the review indicates that the discrimination may extend beyond the actions reviewed, such corrective action shall include all affected persons.
- (d) The contractor will promptly investigate all complaints of alleged discrimination made to the contractor in connection with his obligations under this contract, will attempt to resolve such complaints, and will take appropriate corrective action within a reasonable time. If the investigation indicates that the discrimination may affect persons other than the complainant, such corrective action shall include such other persons. Upon completion of each investigation, the contractor will inform every complainant of all of his avenues of appeal.

Training and Promotion

- (a) The contractor will assist in locating, qualifying, and increasing the skills of minority group and women employees, and applicants for employment.
- (b) Consistent with the contractor's work force requirements and as permissible under Federal and State regulations, the contractor shall make full use of training programs, i.e., apprenticeship, and on-the-job training programs for the geographical area of contract performance. Where feasible, 25 percent of apprentices or trainees in each occupation shall be in their first year of apprenticeship or training. In the event the Special Provision Regarding Training Program Requirements is provided under this contract, this subparagraph will be superseded as indicated therein.
- (c) The contractor will advise employees and applicants for employment of available training programs and entrance requirements for each.

- (d) The contractor will periodically review the training and promotion potential of minority group and women employees and will encourage eligible employees to apply for such training and promotion.

Unions

If the contractor relies in whole or in part upon unions as a source of employees, the contractor will use his/her best efforts to obtain the cooperation of such unions to increase opportunities for minority groups and women within the unions, and to effect referrals by such unions of minority and female employees. Actions by the contractor either directly or through a contractor's association acting as agent will include the procedures set forth below:

- (a) The contractor will use best efforts to develop, in cooperation with the unions, joint training programs aimed toward qualifying more minority group members and women for membership in the unions and increasing the skills of minority group employees and women so that they may qualify for higher paying employment.
- (b) The contractor will use best efforts to incorporate an equal employment opportunity clause into each union agreement to the end that such union will be contractually bound to refer applicants without regard to their age, race, color, religion, sex, national origin or disability .
- (c) The contractor is to obtain information as to the referral practices and policies of the labor union except that to the extent such information is within the exclusive possession of the labor union and such labor union refuses to furnish such information to the contractor, the contractor shall so certify to the Tennessee Department of Transportation and shall set forth what efforts have been made to obtain such information.
- (d) In the event the union is unable to provide the contractor with a reasonable flow of minority and women referrals within the time limit set forth in the collective bargaining agreement, the contractor will, through independent recruitment efforts, fill the employment vacancies without regard to age, race, color, religion, sex, national origin or disability, making full efforts to obtain qualified and/or qualifiable minority group persons and women. (The U.S. Department of Labor has held that it shall be no excuse that the union with which the contractor has a collective bargaining agreement providing for exclusive referral failed to refer minority employees). In the event the union referral practice prevents the contractor from meeting the obligations pursuant to Executive Order 11246, as amended, and these special provisions, such contractor shall immediately notify the Tennessee Department of Transportation.

Subcontracting

- (a) The contractor will use his best efforts to solicit bids from and to utilize minority group subcontractors or subcontractors with meaningful minority group and female representation among their employees. Contractors shall obtain lists of minority-owned construction firms from the Tennessee Department of Transportation.

- (b) The contractor will use his best efforts to ensure subcontractor compliance with their equal employment opportunity obligations.

Records and Reports

- (a) The contractor will keep such records as are necessary to determine compliance with the contractor's equal employment opportunity obligations. The records kept by the contractor will be designed to indicate:
 - (1) The number of minority and non-minority group members and women employed in each work classification on the project.
 - (2) The progress and efforts being made in cooperation with unions to increase employment opportunities for minorities and women. (Applicable only to contractors who rely in whole or in part on unions as a source for their work force).
 - (3) The progress and efforts being made in locating, hiring, training, qualifying, and upgrading minority and female employees.
 - (4) The progress and efforts being made in securing the services of minority group subcontractors or subcontractors with meaningful minority and female representation among their employees.
- (b) All such records must be retained for a period of 3 years following completion of the contract work and shall be available at reasonable times and places for inspection by authorized representatives of the of the Tennessee Department of Transportation and the Federal Highway Administration.
- (c) Each contractor and subcontractor shall submit to the Tennessee Department of Transportation an annual report for every July during which work is performed indicating the number of minority, women and non-minority group employees currently engaged in each work classification required by the contract work. This information is to be reported on Form PR 1391 and is to be received by the Department not later than the 20th of the month following the reporting period.
- (d) The contractor and/or sub-contractor will be required to complete other reports as instructed by the Engineer.
- (e) Current estimates may be withheld by the Project Engineer when reports are not received within the above specified time limits.

S T A T E**O F****T E N N E S S E E**

March 1, 2006

SPECIAL PROVISION**REGARDING****STANDARD FEDERAL EQUAL EMPLOYMENT OPPORTUNITY****CONSTRUCTION CONTRACT SPECIFICATIONS (EXECUTIVE ORDER 11246)**

- 1) As used in these specifications:
 - a. "Covered area" means the geographical area described in the solicitation from which this contract resulted;
 - b. "Director" means Director, Office of Federal Contract Compliance Programs, United States Department of Labor, or any person to whom the Director delegates authority;
 - c. "Employer identification number" means the Federal Social Security number used on the Employer's Quarterly Federal Tax Return, U.S. Treasury Department Form 941
 - d. "Minority" includes:
 - I. Black (all persons having origins in any of the Black African racial groups not of Hispanic origin);
 - II. Hispanic (all persons of Mexican, Puerto Rican, Cuban, Central or South American or other Spanish or Portuguese Culture or origin, regardless of race);
 - III. Asian and Pacific Islander (all persons having origins in any of the original peoples of the Far East, Southeast Asia, the Indian Subcontinent, or the Pacific Islands); and
 - IV. American Indian or Alaskan Native (all persons having origins in any of the original peoples of North America and maintaining indentifiable tribal affiliations through membership and participation or community identification).
- 2) Whenever the Contractor, or any Subcontractor at any tier, subcontracts a portion of the work involving any construction trade, it shall physically include in each subcontract in excess of \$10,000 the provisions of these specifications and the Notice which contains the applicable goals for minority and female participation and which is set forth in the solicitations from which this contract resulted.

- 3) If the Contractor is participating (pursuant to 41 CFR 60-4.5) in a Hometown Plan approved by the U.S. Department of Labor in the covered area either individually or through an association, its affirmative action obligations on all work in the Plan area (including goals (including goals and time tables) shall be in accordance with that Plan for those trades which have unions participating in the Plan. Contractors must be able to demonstrate their participation in and compliance with the provisions of any such Hometown Plan. Each Contractor or Subcontractor participating in an approved Plan is individually required to comply with its obligations under the EEO clause, and to make a good faith effort to achieve each goal under the Plan in each trade in which it has employees. The overall good faith performance by other Contractors or Subcontractors toward a goal in an approved Plan does not excuse any covered Contractor's or Subcontractor's failure to take good faith efforts to achieve the Plan goals and timetables.
- 4) The Contractor shall implement the specific affirmative action standards provided in paragraphs 7a through p of these specifications. The goal set forth in the solicitation from which this contract resulted are expressed as percentages of the total hours of employment and training of minority and female utilization the Contractor should reasonably be able to achieve in each construction trade in which it has employees in the covered area. The Contractor is expected to make substantially uniform progress toward its goals in each craft during the period specified.
- 5) Neither the provisions of any collective bargaining agreement, nor the failure by a union with whom the Contractor has a collective bargaining agreement, to refer either minorities or women shall excuse the Contractor's obligations under these specification, Executive Order 11246, or the regulations promulgated pursuant thereto.
- 6) In order for the nonworking training hours of apprentices and the trainees to be counted in meeting the goals, such apprentices and trainees must be employed by the Contractor during the training period, and the Contractor must have made a commitment to employ the apprentices and trainees at the completion of their training, subject to the availability of employment opportunities. Trainees must be trained pursuant to training programs approved by the U.S. Department of Labor.
- 7) The Contractor shall take specific affirmative actions to ensure equal employment opportunity. The evaluation of the Contractor's compliance with these specifications shall be based upon its effort to achieve maximum results from its actions. The Contractor shall document these efforts fully, and shall implement affirmative action steps at least as extensive as the following:
 - (a) Ensure and maintain a working environment free of harassment, intimidation, and coercion at all sites, and in all facilities at which the Contractor's employees are assigned to work. The Contractor, where possible, will assign two or more women to each construction project. The Contractor shall specifically ensure that all foremen, superintendents, and other on-site supervisory personnel are aware of and carry out the Contractor's obligation to maintain such a working environment, with specific attention to minority or female individuals working at such sites or in such facilities.

- (b) Establish and maintain a current list of minority and female recruitment sources, provide written notification to minority and female recruitment sources and to community organizations when the Contractor or its unions have employment opportunities available and maintain a record of the organization's responses.
- (c) Maintain a current file of the names, addresses and telephone numbers of each minority and female off-the-street applicant and minority or female referral from a union, a recruitment source or community organization and of what action was taken with respect to each such individual. If such individual was sent to the union hiring hall for referral and was not referred back to the Contractor by the union or, if referred, not employed by the Contractor, this shall be documented in the file with the reason therefor, along with whatever additional actions the Contractor may have taken.
- (d) Provide immediate written notification to the Director when the union or unions with which the Contractor has a collective bargaining agreement has not referred to the Contractor a minority person or woman sent by the Contractor, or when the Contractor has other information that the union referral process has impeded the Contractor's efforts to meet its obligations.
- (e) Develop on-the-job training opportunities and/or participate in training programs for the area which expressly include minorities and women, including upgrading programs and apprenticeship and trainee programs relevant to the Contractor's employment needs, especially those programs funded or approved by the Department of Labor. The contractor shall provide notice of these programs to the sources complied under 7b above.
- (f) Disseminate the Contractor's EEO policy by providing notice of the policy to unions and training programs and requesting their cooperation in assisting the Contractor in meeting its EEO obligations; by including it in any policy manual and collective bargaining agreement; by publicizing it in the company newspaper, annual report, etc.; by specific review of the policy with all management personnel and with all minority and female employees at least once a year; and by posting the company EEO policy on bulletin boards accessible to all employees at each location where construction work is performed.
- (g) Review, at least annually, the company's EEO policy and affirmative action obligations under these specifications with all employees having any responsibility for hiring, assignment, layoff, termination or other employment decisions including specific review of these items with on-site supervisory personnel such as Superintendents, General Foremen, etc., prior to the initiation of construction work at any job site. A written record shall be made and maintained identifying the time and place of these meetings, persons attending, subject matter discussed, and disposition of the subject matter.

- (h) Disseminate the Contractor's EEO policy externally by including it in any advertising in the news media, specifically including minority and female news media, and providing written notification to and discussing the Contractor's EEO policy with other Contractors and Subcontractors with whom the Contractor does or anticipates doing business.
 - (i) Direct its recruitment efforts, both oral and written, to minority, female and community organizations, to schools with minority and female students and to minority and female recruitment and training organizations serving the Contractor's recruitment area and employment needs. Not later than one month prior to the date for the acceptance of applications for apprenticeship or other training by any recruitment source, the Contractor shall send written notification to organizations such as the above, describing the openings, screenings procedures, and tests to be used in the selection process.
 - (j) Encourage present minority and female employees to recruit other minority persons and women and, where reasonable, provide after school, summer and vacation employment to minority and female youth both on the site and in other areas of a Contractor's workforce.
 - (k) Validate all tests and other selection requirements where there is an obligation to do so under 41 CFR Part 60-3.
 - (l) Conduct, at least annually, an inventory and evaluation at least of all minority and female personnel for promotional opportunities and encourage these employees to seek or to prepare for, through appropriation training, etc., such opportunities.
 - (m) Ensure that seniority practices, job classifications, work assignments and other personnel practices, do not have a discriminatory effect by continually monitoring all personnel and employment related activities to ensure that the EEO policy and the Contractor's obligations under these specifications are being carried out.
 - (n) Ensure that all facilities and company activities are nonsegregated except that separate or single-user toilet and necessary changing facilities shall be provided to assure privacy between the sexes.
 - (o) Document and maintain a record of all solicitations of offers for subcontracts from minority and female construction contractors and suppliers, including circulation of solicitations to minority and female contractor associations and other business associations.
 - (p) Conduct a review, at least annually, of all supervisor's adherence to and performance under the Contractor's EEO policies and affirmative action obligations.
- 8) Contractors are encouraged to participate in voluntary associations which assist in fulfilling one or more of their affirmative action obligations (7a through p). The efforts of a contractor

association, joint contractor-union, contractor-community, or other similar group of which the contractor is a member and participant, may be asserted as fulfilling any one or more of its obligations under 7a through p of these Specifications provided that the contractor actively participates in the group, makes every effort to assure that the group has a positive impact on the employment of minorities and women in the industry, ensures that the concrete benefits of the program are reflected in the Contractor's minority and female workforce participation, makes a good faith effort to meet its individual goals and timetables, and can provide access to documentation which demonstrates the effectiveness of actions taken on behalf of the Contractor. The obligation to comply, however, is the Contractor's and failure of such a group to fulfill an obligation shall not be a defense for the Contractor's noncompliance.

- 9) A single goal for minorities and a separate single goal for women have been established. The Contractor, however, is required to provide equal employment opportunity and to take affirmative action for all minority groups, both male and female, and all women, both minority and non-minority. Consequently, the Contractor may be in violation of the Executive Order if a particular group is employed in a substantially disparate manner (for example, even though the Contractor has achieved its goals for women, generally, the Contractor may be in violation of the Executive Order if a specific minority group of women is underutilized).
- 10) The Contractor shall not use the goals and timetables or affirmative action standards to discriminate against any person because of age, race, color, religion, sex, national origin or disability.
- 11) The Contractor shall not enter into any Subcontract with any person or firm debarred from Government contracts pursuant to Executive Order 11246.
- 12) The Contractor shall carry out such sanctions and penalties for violations of these specifications and of the Equal Opportunity Clause, including suspension, termination and cancellation of existing subcontracts as may be imposed or ordered pursuant to Executive Order 11246, as amended, and its implementing regulations, by the Office of Federal Contract Compliance Programs. Any Contractor who fails to carry out such sanctions and penalties shall be in violation of these specifications and Executive Order 11246, as amended.
- 13) The Contractor, in fulfilling its obligations under these specifications, shall implement specific affirmative action steps, at least as extensive as those standards prescribed in paragraph 7 of these specifications, so as to achieve maximum results from its efforts to ensure equal employment opportunity. If the Contractor fails to comply with the requirements of the Executive Order, the implementing regulations, or these specifications, the Director shall proceed in accordance with 41 CFR 60-4.8.
- 14) The Contractor shall designate a responsible official to monitor all employment related activity to ensure that the company EEO policy is being carried out, to submit reports relating to the provisions hereof as may be required by the Government and to keep records. Records

shall at least include for each employee the name, address, telephone numbers, construction trade, union affiliation if any, employee identification number when assigned, social security number, race, sex, status (e.g., mechanic, apprentice, trainee, helper, or laborer), dates of changes in status, hours worked per week in the indicated trade, rate of pay, and locations at which the work was performed. Records shall be maintained in an easily understandable and retrievable form; however, to the degree that existing records satisfy this requirement, contractors shall not be required to maintain separate records.

- 15) Nothing herein provided shall be construed as a limitation upon the application of other laws which establish different standards of compliance or upon the application of requirements for the hiring of local or other area residents (e.g., those under the Public Works Employment Act of 1977 and the Community Development Block Grant Program).

S T A T E**O F****T E N N E S S E E**

March 1, 2006

SPECIAL PROVISION**REGARDING****NOTICE OF REQUIREMENT FOR AFFIRMATIVE ACTION****TO ENSURE EQUAL EMPLOYMENT OPPORTUNITY (EXECUTIVE ORDER 11246)**

1. The Bidder's attention is called to the "Equal Opportunity Clause" and the "Standard Federal Equal Employment Opportunity Construction Contract Specifications" set forth herein.
2. The goals for minority and female participation, expressed in percentage terms for the Contractor's aggregate workforce in each trade on all construction work are as follows:

<u>County</u>	Goals for Female Participation <u>in each Trade</u>
All Counties	6.9
<u>County</u>	Goals for Minority Participation <u>for each Trade</u>
Lincoln	11.2
Hamilton, Marion, Sequatchie	12.5
Bledsoe, Bradley, Grundy, McMinn, Meigs, Monroe, Polk, Rhea	8.6
Carter, Hawkins, Sullivan, Unicoi, Washington	2.6
Greene, Hancock, Johnson	3.2
Anderson, Blount, Knox, Union	6.6
Campbell, Claiborne, Cocke, Cumberland, Fentress, Grainger, Hamblen, Jefferson, Loudon, Morgan, Roane, Scott, Sevier	4.5

<u>County</u>	<u>Goals for Minority Participation for each Trade</u>
Montgomery	18.2
Davidson, Cheatham, Dickson, Robertson, Sumner, Williamson, Wilson, Rutherford	15.8
Bedford, Cannon, Clay, Coffee, DeKalb, Franklin, Giles, Hickman, Houston, Humphreys, Jackson, Lawrence, Lewis, Macon, Marshall, Maury, Moore, Overton, Perry, Pickett, Putnam, Smith, Stewart, Trousdale, Van Buren, Warren, Wayne, White	12.0
Shelby, Tipton	32.3
Benton, Carroll, Chester, Crockett, Decatur, Dyer, Fayette, Gibson, Hardeman, Hardin, Haywood, Henderson, Henry, Lake, Lauderdale, McNairy, Madison, Obion, Weakley	26.5

These goals are applicable to all the Contractor's construction work whether or not it is Federal or federally assisted.

The Contractor's compliance with the Executive Order and the regulations in 41 CFR Part 60-4 shall be based on its implementation of the Equal Opportunity Clause, specific affirmative action obligations required by the specifications set forth in CFR Part 60-4.3(a), and its efforts to meet the goals established for the geographical area where the contract resulting from this solicitation is to be performed. The hours of minority and female employment and training must be substantially uniform throughout the length of the contract, and in each trade, and the Contractor shall make a good faith effort to employ minorities and women evenly on each of its projects. The transfer of minority or female employees or trainees from Contractor to Contractor or from Project to Project for the sole purpose of meeting the Contractor's goals shall be a violation of the contract, the Executive Order and the regulations in 41 CFR Part 60-4. Compliance with the goals will be measured against the total work hours performed.

3. The Contractor shall provide written notification to the Office of Federal Contract Compliance Programs at the following address within 10 working days of award of any construction subcontract in excess of \$10,000 at any tier for construction work under the contract resulting from this solicitation:

Associate Regional Director
Office of Federal Contract Compliance Program
1371 Peachtree Street, N.E., Room 111
Atlanta, GA 30367

The notification shall list the name, address and telephone number of the subcontractor; employer identification number; estimated dollar amount of the subcontract; estimated starting and completion dates of the subcontract; and the geographical area in which the contract is to be performed.

STATE**OF**Sheet 1 of 1
TENNESSEE

(Rev. 06-01-03)

(Rev. 06-23-08)

(Rev. 11-10-08)

March 1, 2006

SPECIAL PROVISION**REGARDING****DISADVANTAGED BUSINESS ENTERPRISE PARTICIPATION**

Disadvantaged Business Enterprises (DBE) as defined in 49 CFR Part 23/26 shall have the maximum opportunity to participate in the performance of contracts let by the Department. Consequently, the disadvantaged business enterprise requirements of 49 CFR Part 23/26 apply to this contract.

Disadvantaged Business Enterprises (DBE) as defined in 49 CFR Part 23/26 shall have the maximum opportunity to participate in the performance of this contract or in the performance of subcontracts to this contract. In this latter regard, the Contractor shall take all necessary and reasonable steps in accordance with 49 CFR Part 23/26 to ensure that disadvantaged enterprises, including enterprises owned and controlled by women, have the maximum opportunity to compete for and perform subcontracts. The Contractor shall not discriminate on the basis of age, race, color, religion, national origin, sex or disability in the award of subcontracts.

The Contractor shall submit to the Civil Rights Office Small Business Development Program copies of any agreements with DBE/WBEs upon execution.

The Contractor is advised that failure to carry out the requirements as set forth above shall constitute a breach of contract, and after notification by the Department, may result in termination of the contract or other remedy deemed appropriate by the Department.

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STATEOFTENNESSEE

(Rev. 12-01-06)

(Rev. 11-10-08)

(Rev. 9-17-11)

March 1, 2006

SPECIAL PROVISIONREGARDINGDBE CONTRACT GOAL

All contractors shall pursue affirmative action requirements to encourage and increase participation of disadvantaged individuals in business enterprises as set forth in this specification which is imposed pursuant to 49 CFR 26. The bidder shall arrange for 0% percent of the work to be performed by Disadvantaged Business Enterprises (DBEs) or clearly demonstrate adequate good faith efforts as described herein.

A. Disadvantaged Business Enterprise Policy.

The Contractor shall accept as operating policy and include in all subcontract agreements the following statement, which is designed to promote full participation of DBEs as suppliers and subcontractors through a continuous, positive result-oriented program on contracts let by the Department:

The Contractor, sub recipient or subcontractor shall not discriminate on the basis of race, color, national origin, or sex in the performance of this contract. The Contractor shall carry out applicable requirements of 49 CFR part 26 in the award and administration of Department assisted contracts. Failure by the Contractor to carry out these requirements is a material breach of this contract, which may result in the termination of this contract or such other remedy, as the Department deems appropriate.

B. Counting DBE Participation Toward Meeting Goals.

The Contractor shall count DBE participation toward goals in accordance with 49 CFR 26. The Contractor may count toward the goals only expenditures to DBEs that perform a commercially useful function of a contract, including those functions as a subcontractor. A DBE performs a commercially useful function when it is responsible for execution of the work of the contract and is carrying out its responsibilities by actually performing, managing, and supervising the work involved. To perform a commercially useful function, the DBE must also be responsible, with respect to materials and supplies used on the contract, for negotiating price, determining quality and quantity, ordering the material, and installing (where applicable) and paying for the material itself. Work performed by a DBE firm

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in a particular transaction may be counted toward the goal only if the Department determines that it involves a commercially useful function. The work performed by the DBE firm shall be necessary and useful to the completion of the contract, and consistent with normal highway construction industry practices in Tennessee. The bidder may count the following DBE expenditures towards the DBE commitment:

- 1. Projects where the DBE is the Prime Contractor** - The portions of the contract to be completed by certified DBE firms will be counted toward meeting the goal. Items of the contract subcontracted to non-DBE firms will not be counted in the commitment.
- 2. Portions of a bid from a Joint Venture** - A bid from a joint venture, between a DBE and non-DBE Contractor, shall include a "Statement of DBE Commitments" which must be approved by the Department prior to the Letting. Only the DBE's portion will be counted toward the goal. Joint venture agreements have to be approved separately from the bid documents, prior to the awarding of the contract.
- 3. DBE Subcontractors** - The DBE subcontractor shall assume actual and contractual responsibility for provision of materials and supplies, subcontracted work, or other commercially useful functions of the items of work subcontracted to them. Cost of materials purchased from or the cost of equipment leased from the Contractor will not count toward the project DBE commitment. Prior written approval must be obtained from the Department's Civil Rights Office - Small Business Development Program (CRO - SBDP) for any DBE use of prime contractor's personnel or equipment.
- 4. Manufacturers** - The Contractor may count toward the DBE commitment 100% of its expenditures for materials and supplies required under a contract and obtained from a DBE manufacturer only if the DBE firm produces and supplies goods manufactured from raw materials or substantially alters them before resale.
- 5. Regular Dealers (e.g. Material Suppliers)** - The Contractor may count toward the DBE goal 60% of its expenditures for materials and supplies required under a contract and obtained from a DBE regular dealer only if the DBE firm performs a commercially useful function in the supply process. For purposes of this section, a regular dealer is a firm that owns; operates; or maintains a store, warehouse, or other establishment in which materials or supplies required for the performance of the contract are bought, kept in stock, and regularly sold to the public in the usual course of business. To be a regular dealer, the firm shall engage in, as its principal business and in its own name, the purchase and sale of the products in question. A regular dealer in such bulk items as steel, cement, gravel, stone, and petroleum products need not keep such products in stock if it owns or operates the distribution equipment. If the DBE supplier does not own the distribution equipment, a lease containing the terms of the agreement shall be available and must be approved in writing by the CRO - SBDP.

- 6. Brokers and Packagers** - Brokers and packagers will not be regarded as regular dealers within the meaning of this section. Only the cost of the service performed may be used towards meeting the DBE commitment.
- 7. Transportation or Hauling of Materials** –The Department will continue to utilize the trucking regulations, under 49 CFR 26.55. This regulation allows for DBE goal hauling-credit in either DBE trucks or in trucks leased to or by DBE firms. The verification of truck drivers employed by DBE firms will continue to be by submission of payrolls independent from any Davis-Bacon regulations.
- a) The DBE must be responsible for the management and supervision of the entire trucking operation for which it is responsible on a particular contract, and there cannot be a contrived arrangement for the purpose of meeting DBE goals.
 - b) The DBE must itself own and operate at least one fully licensed, insured, and operational truck used on the contract.
 - c) The DBE receives credit for the total value of the transportation services it provides on the contract using trucks it owns, insures, and operates using drivers it employs.
 - d) The DBE may lease trucks from another DBE firm, including an owner-operator who is certified as a DBE. The DBE who leases trucks from DBE receives credit for the total value of the transportation services the lessee DBE provides on the contract.
 - e) The DBE may also lease trucks from a non-DBE firm, including an owner-operator. The DBE who leases trucks from a non-DBE is entitled to the total value of transportation services provided by non-DBE lessees not to exceed the value of transportation services provided by DBE-owned trucks on the contract. Additional participation by non-DBE lessees receives credit only for the fee or commission it receives as a result of the lease arrangement.
 - f) For purposes of this paragraph a lease must indicate that the DBE has exclusive use of and control over the truck. Leases cannot be Department contract-specific, must be long term, and must be approved by the CRO - SBDP Staff. This does not preclude the leased truck from working for others during the term of the lease with the consent of the DBE, so long as the lease gives the DBE absolute priority for use of the leased truck. Leased trucks must display the name and identification number of the DBE.
 - g) Prior to hauling, the Contractor and DBE shall provide the Department's Project Supervisor a complete list of trucks that will be used on the project for DBE goal participation. The Department will provide a form that shall be used by the Contractor and DBE to identify the trucks. A revised list will be required any time the trucks used changes. The Contractor and DBE must be able to adequately document the actual amount of hauling eligible for DBE goal participation.

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7. **Contracted Labor / Temporary Employment Agencies** – utilization of these services via subcontract will be allowed to count toward DBE goal commitment, in accordance with 49 CFR part 26.55. The Department will count the entire amount of fees or commissions charged by a DBE for providing a bona fide service. Provided, the Department must find the fee to be reasonable and not excessive as compared to the fees customarily allowed for similar services.
8. **Other Commercially Useful Functions** - The fees paid to certified DBE firms, which are necessary for the completion of the contract and commonplace outside of the DBE program, may be counted towards the commitment.

C. Contract Award Procedures

The established DBE goal will be shown on the proposal as a percent of the total amount bid. If the total proposed DBE work submitted with the bid is less than the percentage of participation goals set by the Department, the bidder shall, within three (3) business days from the bid openings, propose sufficient additional DBE participation to meet the goal or shall clearly demonstrate by documentation that good faith efforts were made to meet the goal.

1. Bidder' Responsibility.

It is the bidder's responsibility to determine the level of professional competence and financial responsibility of any proposed DBE subcontractor. The bidder shall ascertain that the proposed DBE subcontractor has suitable experience and equipment to perform a commercially useful function for work that is common industry practice in the Tennessee highway construction industry.

Contractor shall develop and maintain records of negotiations with DBEs to reach agreeable prices, quotations and work schedules, including but not limited to a record of dates when the Contractor first contacted each DBE.

2. Proposals With Established Project DBE Goals.

For proposals with established project goals, the bidder will be required to complete computer generated Form 1247A. The bidder shall list the following information on Form 1247A that is submitted:

- a. All DBE firms being used or being considered for use as part of the bidder's DBE commitment.
- b. The type of work items on the contract for which the DBE will be used.
- c. The "Amount to DBE" which has been committed to each DBE firm which will be used on the contract.

The completed 1247A form shall be submitted within three (3) business days of the Letting. Failure to provide a completed form or documentation clearly evidencing a good faith effort, as detailed in C.3. below, within three (3) business days of the Letting may cause the bid to be rejected as irregular. Only certified DBE firms may

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be used. Contractor may access this information on the DBE list by viewing the Department's website or the certified DBE listing.

When DBE goal projects are involved and the prime contractor subcontracts to a non DBE, and the non-DBE subcontractor in turn subcontracts to a DBE as a second tier subcontractor, the prime contractor must affirm in writing his/her knowledge and approval of such an arrangement. Recognition of a second tier arrangement with a DBE subcontractor for goal work must be forwarded to the Director of the CRO - SBDP for verification, in writing, prior to any work performed by the DBE being counted toward the goal.

3. Bidder Selection and Good Faith Efforts

- a.** Bidders shall submit proposals that meet the DBE goal or shall submit documentation clearly evidencing that they made good faith effort to meet the DBE goal. Contractors who meet or exceed the contract goal will be assumed to have made good faith efforts to utilize DBE firms. DBE firms who bid as prime contractors will be considered to have met the goal.
- b.** The following are illustrative of factors which will be considered in determining whether the bidder has made adequate good faith efforts:
 - 1) Whether the bidder selected portions of the work likely to attract DBE participation. The total dollar value of the portions selected should meet or exceed the contract DBE goal. If it is necessary, the bidder should break down subcontracts into economically feasible units in order to facilitate participation.
 - 2) Whether the bidder provided notice to a reasonable number of specific DBEs, including those not regularly used by the bidder, that their participation in the contract is being solicited in sufficient time to allow them to participate effectively.
 - 3) Whether the bidder provided interested DBEs with adequate information about the plans, specifications and requirements of the contract.
 - 4) Whether the bidder advertised in general circulation, trade association, or minority-focus media concerning participation opportunities or effectively used the services of available minority, community organizations, minority contractors groups, local, state or federal minority business assistance offices, or other organizations that provide assistance in the recruitment and placement of DBEs.
 - 5) Whether the bidder negotiated in good faith with interested DBEs, not rejecting DBEs as unqualified without sound reasons based on a thorough investigation of their capabilities.

- 6) Whether the bidder made efforts to assist interested DBEs in obtaining bonding or insurance required by the bidder.
 - 7) Whether the bidder submitted all quotations received from DBEs, and for those quotations not accepted, an explanation of why the DBE was not accepted including price comparisons. Receipt of a lower quotation from a non-DBE will not in itself excuse a bidder's failure to meet contract goal.
 - 8) Whether the bidder has adequate records of its contacts and negotiations with DBEs
- c) If the Contractor has not met the DBE goal or submitted documentation clearly evidencing good faith efforts within three (3) business days after the bid opening, the Contractor's bid will be considered non-responsive and the Department may consider the next lowest responsive bid for award.
 - d) Failure of the bidder to meet the DBE goal in its bid or failure to provide documentation clearly evidencing good faith efforts to meet the goal, may be cause for the forfeiture of the Proposal Guaranty which shall become the property of the Department, not as penalty, but in liquidation of damages sustained.

As soon as practical after award of the contract, the contractor shall submit copies of all binding subcontracts and purchase orders with DBEs to the Project Supervisor and the CRO - SBDP Director. No progress estimate shall be processed until this information is received.

4. Joint Checking Allowance for DBE

A DBE must receive pre-approval by the Department before using a joint check. Joint check requests shall be submitted, by the DBE, to the CRO - SBDP prior to the contract agreement.

The following are some general conditions that must be met regarding joint check use:

- a. The second party (typically the prime contractor) acts solely as a guarantor.
- b. The DBE must release the check to the supplier.
- c. The use of joint checks must be a commonly recognized business practice in the industry.
- d. The DBE remains responsible for all other elements of 49 CFR 26.55(c)(1)
- e. The DBE is not required to use a specific supplier nor the prime contractor's negotiated unit price.
- f. The DBE shall submit receipt/copy of cancelled checks to the CRO - SBDP.

D. Construction Period Requirements.

1. After adequate notice by the Contractor, if any DBE is unable to perform work committed toward the goal, the DBE shall provide to the CRO - SBDP a signed statement saying why they are unable to complete the work. The Contractor shall document their efforts to have another DBE perform the item or to have a DBE perform other items to replace the original DBE commitment amounts. In the event the Contractor is not able to find replacement DBE work, the Contractor must provide the CRO - SBDP documentation clearly evidencing good faith efforts, as detailed in C.3. above. Any request for substitution of a DBE subcontractor shall be made to the Department and approved by the CRO - SBDP.
2. Brokering of work by DBEs is not allowed and is a material breach of contract. A DBE firm involved in brokering of work may have their certification removed or suspended. Any firm involved in brokering of work that engages in willful falsification distortion, or misrepresentation with respect to any facts related to the project shall be referred to the U. S. Department of Transportation's Office of the Inspector General for prosecution under Title 18, U. S. Code, Section 100.20. Contractor shall place this provision in all subcontracts with DBEs.
3. A Department Project Supervisor/Inspector shall complete a Commercially Useful Function (CUF) Checklist to document the first date of work, work items, equipment, and forces of each DBE.
4. The Contractor shall provide monthly payment certification to the Department entitled "Prompt Payment Certification Form." The Department shall provide Contractor with the Prompt Payment Certification Form. An officer of the contractor shall sign the Prompt Payment Certification Form. The Department will hold estimate payments if information is not submitted. Reasons for non payment to a DBE could include the following:
 - a) Whether the DBE is performing satisfactorily;
 - b) Whether Contractor has reason to believe the DBE is not performing a commercially useful function, and if so, why and what steps Contractor is taking to rectify the situation.

In the event the Contractor promptly reports questions on the Prompt Payment Certification Form regarding whether a DBE is independent and performing a commercially useful function and takes appropriate steps promptly to address the issue, then the Department will take this effort into account when considering contractor compliance measures as described below.

E. Post Construction Requirements.

Prior to receiving final payment, the Contractor shall provide to the Engineer certification of the dollars paid to each DBE firm, using Form CC3, Certification of DBE Accomplishment. The certification shall be dated and signed by a responsible officer of the contractor and by the DBE. Falsification of this certification will result in suspension of bidder qualifications.

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The final estimate will not be paid to the Contractor until proper certifications have been made.

F. Required Records.

The Prime Contractor and all subcontractors shall retain, for a period of not less than 3 years after final acceptance of a project, copies of canceled checks or other documentation that substantiates payments to DBE firms. These records shall be available at reasonable times and places for inspection by authorized representatives of the Department and Federal Agencies.

G. Contractor Compliance

1. It is the intent of this Special Provision to require the Contractor to take full responsibility for the performance of a commercially useful function by all DBE subcontractors, manufacturers and materials suppliers who work on the project and are counted by the Contractor toward the project DBE goal. A DBE is considered to perform a commercially useful function when it is responsible for execution of a distinct element of the work of a contract and carrying out its responsibilities by actually performing, managing and supervising the work involved (49 CFR Part 26).
2. If the Contractor fails to comply with this Special Provision 1247, the Department may take one or a combination of the following steps:
 - 1) Require the Contractor to have its entire management staff attend DBE training arranged by the Department and paid by the Contractor.
 - 2) The next bid when Contractor is the low bidder on a DBE goal project, require that Contractor shall achieve a DBE participation that is twice the stated goals.
 - 3) For the Contractor's failure to find another DBE subcontractor to substitute for a DBE that is terminated or fails to complete its work on the contract for any reason or to provide the CRO - SBDP documentation clearly evidencing good faith efforts, as detailed in D.1. above, then the Department may withhold from the Contractor an amount not to exceed the amount of money originally committed to the non-complying DBE subcontractor, not as a penalty but as liquidated damages.
 - 4) Suspend the Contractor from participation in Department bid lettings pursuant to rules promulgated by the Department.
 - 5) For repeated failures to comply, debar the Contractor pursuant to rules promulgated by the Department.
 - 6) Invoke other remedies available by law and/or in the contract.
 - 7) Invoke remedy agreed upon by the Commissioner and Contractor in writing.

REQUIRED CONTRACT PROVISIONS FEDERAL-AID CONSTRUCTION CONTRACTS

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I. GENERAL

1. These contract provisions shall apply to all work performed on the contract by the contractor's own organization and with the assistance of workers under the contractor's immediate superintendence and to all work performed on the contract by piecework, station work, or by subcontract.
2. Except as otherwise provided for in each section, the contractor shall insert in each subcontract all of the stipulations contained in these Required Contract Provisions, and further require their inclusion in any lower tier subcontract or purchase order that may in turn be made. The Required Contract Provisions shall not be incorporated by reference in any case. The prime contractor shall be responsible for compliance by any subcontractor or lower tier subcontractor with these Required Contract Provisions.
3. A breach of any of the stipulations contained in these Required Contract Provisions shall be sufficient grounds for termination of the contract.
4. A breach of the following clauses of the Required Contract Provisions may also be grounds for debarment as provided in 29 CFR 5.12:
 - Section I, paragraph 2;
 - Section IV, paragraphs 1, 2, 3, 4, and 7;
 - Section V, paragraphs 1 and 2a through 2g.
5. Disputes arising out of the labor standards provisions of Section IV (except paragraph 5) and Section V of these Required Contract Provisions shall not be subject to the general disputes clause of this contract. Such disputes shall be resolved in accordance with the procedures of the U.S. Department of Labor (DOL) as set forth in 29 CFR 5, 6, and 7. Disputes within the meaning of this clause include disputes between the contractor (or any of its subcontractors) and the contracting agency, the DOL, or the contractor's employees or their representatives.
6. Selection of Labor: During the performance of this contract, the contractor shall not:
 - a. discriminate against labor from any other State, possession, or territory of the United States (except for employment preference for Appalachian contracts, when applicable, as specified in Attachment A), or
 - b. employ convict labor for any purpose within the limits of the project unless it is labor performed by convicts who are on parole, supervised release, or probation.

II. NONDISCRIMINATION

(Applicable to all Federal-aid construction contracts and to all related subcontracts of \$10,000 or more.)

1. **Equal Employment Opportunity:** Equal employment opportunity (EEO) requirements not to discriminate and to take affirmative action to assure equal opportunity as set forth under laws, executive orders, rules, regulations (28 CFR 35, 29 CFR 1630 and 41 CFR 60) and orders of the Secretary of Labor as modified by the provisions prescribed herein, and imposed pursuant to 23 U.S.C. 140 shall constitute the EEO and specific affirmative action standards for the contractor's project activities under this contract. The Equal Opportunity Construction Contract Specifications set forth under 41 CFR 60-4.3 and the provisions of the American Disabilities Act of 1990 (42 U.S.C. 12101 *et seq.*) set forth under 28 CFR 35 and 29 CFR 1630 are incorporated by reference in this contract. In the execution of this contract, the contractor agrees to comply with the following minimum specific requirement activities of EEO:

- a. The contractor will work with the State highway agency (SHA) and the Federal Government in carrying out EEO obligations and in their review of his/her activities under the contract.
- b. The contractor will accept as his operating policy the following statement:

"It is the policy of this Company to assure that applicants are employed, and that employees are treated during employment, without regard to their race, religion, sex, color, national origin, age or disability. Such action shall include: employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship, preapprenticeship, and/or on-the-job training."

2. **EEO Officer:** The contractor will designate and make known to the SHA contracting officers an EEO Officer who will have the responsibility for and must be capable of effectively administering and promoting an active contractor program of EEO and who must be assigned adequate authority and responsibility to do so.

3. **Dissemination of Policy:** All members of the contractor's staff who are authorized to hire, supervise, promote, and discharge employees, or who recommend such action, or who are substantially involved in such action, will be made fully cognizant of, and will implement, the contractor's EEO policy and contractual responsibilities to provide EEO in each grade and classification of employment. To ensure that the above agreement will be met, the following actions will be taken as a minimum:

- a. Periodic meetings of supervisory and personnel office employees will be conducted before the start of work and then not less often than once every six months, at which time the contractor's EEO policy and its implementation will be reviewed and explained. The meetings will be conducted by the EEO Officer.
- b. All new supervisory or personnel office employees will be given a thorough indoctrination by the EEO Officer, covering all major aspects of the contractor's EEO obligations within thirty days following their reporting for duty with the contractor.
- c. All personnel who are engaged in direct recruitment for the project will be instructed by the EEO Officer in the contractor's procedures for locating and hiring minority group employees.
- d. Notices and posters setting forth the contractor's EEO policy will be placed in areas readily accessible to employees, applicants for employment and potential employees.
- e. The contractor's EEO policy and the procedures to implement such policy will be brought to the attention of employees by means of meetings, employee handbooks, or other appropriate means.

4. **Recruitment:** When advertising for employees, the contractor will include in all advertisements for employees the notation: "An Equal Opportunity Employer." All such advertisements will be placed in publications having a large circulation among minority groups in the area from which the project work force would normally be derived.

- a. The contractor will, unless precluded by a valid bargaining agreement, conduct systematic and direct recruitment through public and private employee referral sources likely to yield qualified minority group applicants. To meet this requirement, the contractor will identify sources of potential minority group employees, and establish with such identified sources procedures whereby minority group applicants may be referred to the contractor for employment consideration.
- b. In the event the contractor has a valid bargaining agreement providing for exclusive hiring hall referrals, he is expected to observe the provisions of that agreement to the extent that the system permits the contractor's compliance with EEO contract provisions. (The DOL has held that where implementation of such agreements have the effect of discriminating against minorities or women, or obligates the contractor to do the same, such implementation violates Executive Order 11246, as amended.)
- c. The contractor will encourage his present employees to refer minority group applicants for employment. Information and procedures with regard to referring minority group applicants will be discussed with employees.

5. **Personnel Actions:** Wages, working conditions, and employee benefits shall be established and administered, and personnel actions of every type, including hiring, upgrading, promotion, transfer, demotion, layoff, and termination, shall be taken without regard to race, color, religion, sex, national origin, age or disability. The following procedures shall be followed:

- a. The contractor will conduct periodic inspections of project sites to insure that working conditions and employee facilities do not indicate discriminatory treatment of project site personnel.
- b. The contractor will periodically evaluate the spread of wages paid within each classification to determine any evidence of discriminatory wage practices.

- c. The contractor will periodically review selected personnel actions in depth to determine whether there is evidence of discrimination. Where evidence is found, the contractor will promptly take corrective action. If the review indicates that the discrimination may extend beyond the actions reviewed, such corrective action shall include all affected persons.
- d. The contractor will promptly investigate all complaints of alleged discrimination made to the contractor in connection with his obligations under this contract, will attempt to resolve such complaints, and will take appropriate corrective action within a reasonable time. If the investigation indicates that the discrimination may affect persons other than the complainant, such corrective action shall include such other persons. Upon completion of each investigation, the contractor will inform every complainant of all of his avenues of appeal.

6. Training and Promotion:

- a. The contractor will assist in locating, qualifying, and increasing the skills of minority group and women employees, and applicants for employment.
- b. Consistent with the contractor's work force requirements and as permissible under Federal and State regulations, the contractor shall make full use of training programs, i.e., apprenticeship, and on-the-job training programs for the geographical area of contract performance. Where feasible, 25 percent of apprentices or trainees in each occupation shall be in their first year of apprenticeship or training. In the event a special provision for training is provided under this contract, this subparagraph will be superseded as indicated in the special provision.
- c. The contractor will advise employees and applicants for employment of available training programs and entrance requirements for each.
- d. The contractor will periodically review the training and promotion potential of minority group and women employees and will encourage eligible employees to apply for such training and promotion.

7. Unions: If the contractor relies in whole or in part upon unions as a source of employees, the contractor will use his/her best efforts to obtain the cooperation of such unions to increase opportunities for minority groups and women within the unions, and to effect referrals by such unions of minority and female employees. Actions by the contractor either directly or through a contractor's association acting as agent will include the procedures set forth below:

- a. The contractor will use best efforts to develop, in cooperation with the unions, joint training programs aimed toward qualifying more minority group members and women for membership in the unions and increasing the skills of minority group employees and women so that they may qualify for higher paying employment.
- b. The contractor will use best efforts to incorporate an EEO clause into each union agreement to the end that such union will be contractually bound to refer applicants without regard to their race, color, religion, sex, national origin, age or disability.
- c. The contractor is to obtain information as to the referral practices and policies of the labor union except that to the extent such information is within the exclusive possession of the labor union and such labor union refuses to furnish such information to the contractor, the contractor shall so certify to the SHA and shall set forth what efforts have been made to obtain such information.
- d. In the event the union is unable to provide the contractor with a reasonable flow of minority and women referrals within the time limit set forth in the collective bargaining agreement, the contractor will, through independent recruitment efforts, fill the employment vacancies without regard to race, color, religion, sex, national origin, age or disability; making full efforts to obtain qualified and/or qualifiable minority group persons and women. (The DOL has held that it shall be no excuse that the union with which the contractor has a collective bargaining agreement providing for exclusive referral failed to refer minority employees.) In the event the union referral practice prevents the contractor from meeting the obligations pursuant to Executive Order 11246, as amended, and these special provisions, such contractor shall immediately notify the SHA.

8. Selection of Subcontractors, Procurement of Materials and Leasing of Equipment: The contractor shall not discriminate on the grounds of race, color, religion, sex, national origin, age or disability in the selection and retention of subcontractors, including procurement of materials and leases of equipment.

- a. The contractor shall notify all potential subcontractors and suppliers of his/her EEO obligations under this contract.
- b. Disadvantaged business enterprises (DBE), as defined in 49 CFR 23, shall have equal opportunity to compete for and perform subcontracts which the contractor enters into pursuant to this contract. The contractor will use his best efforts to solicit bids from and to utilize DBE subcontractors or subcontractors with meaningful minority group and female representation among their employees. Contractors shall obtain lists of DBE construction firms from SHA personnel.
- c. The contractor will use his best efforts to ensure subcontractor compliance with their EEO obligations.

9. **Records and Reports:** The contractor shall keep such records as necessary to document compliance with the EEO requirements. Such records shall be retained for a period of three years following completion of the contract work and shall be available at reasonable times and places for inspection by authorized representatives of the SHA and the FHWA.

a. The records kept by the contractor shall document the following:

- (1) The number of minority and non-minority group members and women employed in each work classification on the project;
- (2) The progress and efforts being made in cooperation with unions, when applicable, to increase employment opportunities for minorities and women;
- (3) The progress and efforts being made in locating, hiring, training, qualifying, and upgrading minority and female employees; and
- (4) The progress and efforts being made in securing the services of DBE subcontractors or subcontractors with meaningful minority and female representation among their employees.

b. The contractors will submit an annual report to the SHA each July for the duration of the project, indicating the number of minority, women, and non-minority group employees currently engaged in each work classification required by the contract work. This information is to be reported on Form FHWA-1391. If on-the-job training is being required by special provision, the contractor will be required to collect and report training data.

III. NONSEGREGATED FACILITIES

(Applicable to all Federal-aid construction contracts and to all related subcontracts of \$10,000 or more.)

- a. By submission of this bid, the execution of this contract or subcontract, or the consummation of this material supply agreement or purchase order, as appropriate, the bidder, Federal-aid construction contractor, subcontractor, material supplier, or vendor, as appropriate, certifies that the firm does not maintain or provide for its employees any segregated facilities at any of its establishments, and that the firm does not permit its employees to perform their services at any location, under its control, where segregated facilities are maintained. The firm agrees that a breach of this certification is a violation of the EEO provisions of this contract. The firm further certifies that no employee will be denied access to adequate facilities on the basis of sex or disability.
- b. As used in this certification, the term "segregated facilities" means any waiting rooms, work areas, restrooms and washrooms, restaurants and other eating areas, timeclocks, locker rooms, and other storage or dressing areas, parking lots, drinking fountains, recreation or entertainment areas, transportation, and housing facilities provided for employees which are segregated by explicit directive, or are, in fact, segregated on the basis of race, color, religion, national origin, age or disability, because of habit, local custom, or otherwise. The only exception will be for the disabled when the demands for accessibility override (e.g. disabled parking).
- c. The contractor agrees that it has obtained or will obtain identical certification from proposed subcontractors or material suppliers prior to award of subcontracts or consummation of material supply agreements of \$10,000 or more and that it will retain such certifications in its files.

IV. PAYMENT OF PREDETERMINED MINIMUM WAGE

(Applicable to all Federal-aid construction contracts exceeding \$2,000 and to all related subcontracts, except for projects located on roadways classified as local roads or rural minor collectors, which are exempt.)

1. General:

- a. All mechanics and laborers employed or working upon the site of the work will be paid unconditionally and not less often than once a week and without subsequent deduction or rebate on any account [except such payroll deductions as are permitted by regulations (29 CFR 3) issued by the Secretary of Labor under the Copeland Act (40 U.S.C. 276c)] the full amounts of wages and bona fide fringe benefits (or cash equivalents thereof) due at time of payment. The payment shall be computed at wage rates not less than those contained in the wage determination of the Secretary of Labor (hereinafter "the wage determination") which is attached hereto and made a part hereof, regardless of any contractual relationship which may be alleged to exist between the contractor or its subcontractors and such laborers and mechanics. The wage determination (including any additional classifications and wage rates conformed under paragraph 2 of this Section IV and the DOL poster (WH-1321) or Form FHWA-1495) shall be posted at all times by the contractor and its subcontractors at the site of the work in a prominent and accessible place where it can be easily seen by the workers. For the purpose of this Section, contributions made or costs reasonably anticipated for bona fide fringe benefits under Section 1(b)(2) of the Davis-Bacon Act (40 U.S.C. 276a) on behalf of laborers or mechanics are considered wages paid to such laborers or mechanics, subject to the provisions of Section IV, paragraph 3b, hereof. Also, for the purpose of this Section, regular contributions made or costs incurred for more than a weekly period (but not less often than quarterly) under plans, funds, or programs, which cover the particular weekly period, are deemed to be constructively made or incurred during such weekly period. Such laborers and mechanics shall be paid the appropriate wage rate and fringe benefits on the wage determination for the classification of work actually performed, without regard to skill, except as provided in paragraphs 4 and 5 of this Section IV.

- b. Laborers or mechanics performing work in more than one classification may be compensated at the rate specified for each classification for the time actually worked therein, provided, that the employer's payroll records accurately set forth the time spent in each classification in which work is performed.
- c. All rulings and interpretations of the Davis-Bacon Act and related acts contained in 29 CFR 1, 3, and 5 are herein incorporated by reference in this contract.

2. Classification:

- a. The SHA contracting officer shall require that any class of laborers or mechanics employed under the contract, which is not listed in the wage determination, shall be classified in conformance with the wage determination.
- b. The contracting officer shall approve an additional classification, wage rate and fringe benefits only when the following criteria have been met:
 - (1) the work to be performed by the additional classification requested is not performed by a classification in the wage determination;
 - (2) the additional classification is utilized in the area by the construction industry;
 - (3) the proposed wage rate, including any bona fide fringe benefits, bears a reasonable relationship to the wage rates contained in the wage determination; and
 - (4) with respect to helpers, when such a classification prevails in the area in which the work is performed.
- c. If the contractor or subcontractors, as appropriate, the laborers and mechanics (if known) to be employed in the additional classification or their representatives, and the contracting officer agree on the classification and wage rate (including the amount designated for fringe benefits where appropriate), a report of the action taken shall be sent by the contracting officer to the DOL, Administrator of the Wage and Hour Division, Employment Standards Administration, Washington, D.C. 20210. The Wage and Hour Administrator, or an authorized representative, will approve, modify, or disapprove every additional classification action within 30 days of receipt and so advise the contracting officer or will notify the contracting officer within the 30-day period that additional time is necessary.
- d. In the event the contractor or subcontractors, as appropriate, the laborers or mechanics to be employed in the additional classification or their representatives, and the contracting officer do not agree on the proposed classification and wage rate (including the amount designated for fringe benefits, where appropriate), the contracting officer shall refer the questions, including the views of all interested parties and the recommendation of the contracting officer, to the Wage and Hour Administrator for determination. Said Administrator, or an authorized representative, will issue a determination within 30 days of receipt and so advise the contracting officer or will notify the contracting officer within the 30-day period that additional time is necessary.
- e. The wage rate (including fringe benefits where appropriate) determined pursuant to paragraph 2c or 2d of this Section IV shall be paid to all workers performing work in the additional classification from the first day on which work is performed in the classification.

3. Payment of Fringe Benefits:

- a. Whenever the minimum wage rate prescribed in the contract for a class of laborers or mechanics includes a fringe benefit which is not expressed as an hourly rate, the contractor or subcontractors, as appropriate, shall either pay the benefit as stated in the wage determination or shall pay another bona fide fringe benefit or an hourly case equivalent thereof.
- b. If the contractor or subcontractor, as appropriate, does not make payments to a trustee or other third person, he/she may consider as a part of the wages of any laborer or mechanic the amount of any costs reasonably anticipated in providing bona fide fringe benefits under a plan or program, provided, that the Secretary of Labor has found, upon the written request of the contractor, that the applicable standards of the Davis-Bacon Act have been met. The Secretary of Labor may require the contractor to set aside in a separate account assets for the meeting of obligations under the plan or program.

4. Apprentices and Trainees (Programs of the U.S. DOL) and Helpers:

- a. Apprentices:
 - (1) Apprentices will be permitted to work at less than the predetermined rate for the work they performed when they are employed pursuant to and individually registered in a bona fide apprenticeship program registered with the DOL, Employment and Training Administration, Bureau of Apprenticeship and Training, or with a State apprenticeship agency recognized by the

Bureau, or if a person is employed in his/her first 90 days of probationary employment as an apprentice in such an apprenticeship program, who is not individually registered in the program, but who has been certified by the Bureau of Apprenticeship and Training or a State apprenticeship agency (where appropriate) to be eligible for probationary employment as an apprentice.

- (2) The allowable ratio of apprentices to journeyman-level employees on the job site in any craft classification shall not be greater than the ratio permitted to the contractor as to the entire work force under the registered program. Any employee listed on a payroll at an apprentice wage rate, who is not registered or otherwise employed as stated above, shall be paid not less than the applicable wage rate listed in the wage determination for the classification of work actually performed. In addition, any apprentice performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. Where a contractor or subcontractor is performing construction on a project in a locality other than that in which its program is registered, the ratios and wage rates (expressed in percentages of the journeyman-level hourly rate) specified in the contractor's or subcontractor's registered program shall be observed.
- (3) Every apprentice must be paid at not less than the rate specified in the registered program for the apprentice's level of progress, expressed as a percentage of the journeyman-level hourly rate specified in the applicable wage determination. Apprentices shall be paid fringe benefits in accordance with the provisions of the apprenticeship program. If the apprenticeship program does not specify fringe benefits, apprentices must be paid the full amount of fringe benefits listed on the wage determination for the applicable classification. If the Administrator for the Wage and Hour Division determines that a different practice prevails for the applicable apprentice classification, fringes shall be paid in accordance with that determination.
- (4) In the event the Bureau of Apprenticeship and Training, or a State apprenticeship agency recognized by the Bureau, withdraws approval of an apprenticeship program, the contractor or subcontractor will no longer be permitted to utilize apprentices at less than the applicable predetermined rate for the comparable work performed by regular employees until an acceptable program is approved.

b. Trainees:

- (1) Except as provided in 29 CFR 5.16, trainees will not be permitted to work at less than the predetermined rate for the work performed unless they are employed pursuant to and individually registered in a program which has received prior approval, evidenced by formal certification by the DOL, Employment and Training Administration.
- (2) The ratio of trainees to journeyman-level employees on the job site shall not be greater than permitted under the plan approved by the Employment and Training Administration. Any employee listed on the payroll at a trainee rate who is not registered and participating in a training plan approved by the Employment and Training Administration shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any trainee performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed.
- (3) Every trainee must be paid at not less than the rate specified in the approved program for his/her level of progress, expressed as a percentage of the journeyman-level hourly rate specified in the applicable wage determination. Trainees shall be paid fringe benefits in accordance with the provisions of the trainee program. If the trainee program does not mention fringe benefits, trainees shall be paid the full amount of fringe benefits listed on the wage determination unless the Administrator of the Wage and Hour Division determines that there is an apprenticeship program associated with the corresponding journeyman-level wage rate on the wage determination which provides for less than full fringe benefits for apprentices, in which case such trainees shall receive the same fringe benefits as apprentices.
- (4) In the event the Employment and Training Administration withdraws approval of a training program, the contractor or subcontractor will no longer be permitted to utilize trainees at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

c. Helpers:

Helpers will be permitted to work on a project if the helper classification is specified and defined on the applicable wage determination or is approved pursuant to the conformance procedure set forth in Section IV.2. Any worker listed on a payroll at a helper wage rate, who is not a helper under an approved definition, shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed.

5. Apprentices and Trainees (Programs of the U.S. DOT):

Apprentices and trainees working under apprenticeship and skill training programs which have been certified by the Secretary of Transportation as promoting EEO in connection with Federal-aid highway construction programs are not subject to the requirements of paragraph 4 of this Section IV. The straight time hourly wage rates for apprentices and trainees under such programs will be established by

the particular programs. The ratio of apprentices and trainees to journeymen shall not be greater than permitted by the terms of the particular program.

6. Withholding:

The SHA shall upon its own action or upon written request of an authorized representative of the DOL withhold, or cause to be withheld, from the contractor or subcontractor under this contract or any other Federal contract with the same prime contractor, or any other Federally-assisted contract subject to Davis-Bacon prevailing wage requirements which is held by the same prime contractor, as much of the accrued payments or advances as may be considered necessary to pay laborers and mechanics, including apprentices, trainees, and helpers, employed by the contractor or any subcontractor the full amount of wages required by the contract. In the event of failure to pay any laborer or mechanic, including any apprentice, trainee, or helper, employed or working on the site of the work, all or part of the wages required by the contract, the SHA contracting officer may, after written notice to the contractor, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds until such violations have ceased.

7. Overtime Requirements:

No contractor or subcontractor contracting for any part of the contract work which may require or involve the employment of laborers, mechanics, watchmen, or guards (including apprentices, trainees, and helpers described in paragraphs 4 and 5 above) shall require or permit any laborer, mechanic, watchman, or guard in any workweek in which he/she is employed on such work, to work in excess of 40 hours in such workweek unless such laborer, mechanic, watchman, or guard receives compensation at a rate not less than one-and-one-half times his/her basic rate of pay for all hours worked in excess of 40 hours in such workweek.

8. Violation:

Liability for Unpaid Wages; Liquidated Damages: In the event of any violation of the clause set forth in paragraph 7 above, the contractor and any subcontractor responsible thereof shall be liable to the affected employee for his/her unpaid wages. In addition, such contractor and subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory) for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer, mechanic, watchman, or guard employed in violation of the clause set forth in paragraph 7, in the sum of \$10 for each calendar day on which such employee was required or permitted to work in excess of the standard work week of 40 hours without payment of the overtime wages required by the clause set forth in paragraph 7.

9. Withholding for Unpaid Wages and Liquidated Damages:

The SHA shall upon its own action or upon written request of any authorized representative of the DOL withhold, or cause to be withheld, from any monies payable on account of work performed by the contractor or subcontractor under any such contract or any other Federal contract with the same prime contractor, or any other Federally-assisted contract subject to the Contract Work Hours and Safety Standards Act, which is held by the same prime contractor, such sums as may be determined to be necessary to satisfy any liabilities of such contractor or subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in paragraph 8 above.

V. STATEMENTS AND PAYROLLS

(Applicable to all Federal-aid construction contracts exceeding \$2,000 and to all related subcontracts, except for projects located on roadways classified as local roads or rural collectors, which are exempt.)

1. Compliance with Copeland Regulations (29 CFR 3):

The contractor shall comply with the Copeland Regulations of the Secretary of Labor which are herein incorporated by reference.

2. Payrolls and Payroll Records:

- a. Payrolls and basic records relating thereto shall be maintained by the contractor and each subcontractor during the course of the work and preserved for a period of 3 years from the date of completion of the contract for all laborers, mechanics, apprentices, trainees, watchmen, helpers, and guards working at the site of the work.
- b. The payroll records shall contain the name, social security number, and address of each such employee; his or her correct classification; hourly rates of wages paid (including rates of contributions or costs anticipated for bona fide fringe benefits or cash equivalent thereof the types described in Section 1(b)(2)(B) of the Davis Bacon Act); daily and weekly number of hours worked; deductions made; and actual wages paid. In addition, for Appalachian contracts, the payroll records shall contain a notation indicating whether the employee does, or does not, normally reside in the labor area as defined in Attachment A, paragraph 1. Whenever the Secretary of Labor, pursuant to Section IV, paragraph 3b, has found that the wages of any laborer or mechanic include the amount of any costs reasonably anticipated in providing benefits under a plan or program described in Section 1(b)(2)(B) of the Davis Bacon Act, the contractor and each subcontractor shall maintain records which show that the commitment to provide such benefits is enforceable, that the plan or program is financially responsible, that the plan or program has been communicated in writing to the laborers or mechanics affected, and show the cost anticipated or the actual cost incurred in providing benefits.

Contractors or subcontractors employing apprentices or trainees under approved programs shall maintain written evidence of the registration of apprentices and trainees, and ratios and wage rates prescribed in the applicable programs.

- c. Each contractor and subcontractor shall furnish, each week in which any contract work is performed, to the SHA resident engineer a payroll of wages paid each of its employees (including apprentices, trainees, and helpers, described in Section IV, paragraphs 4 and 5, and watchmen and guards engaged on work during the preceding weekly payroll period). The payroll submitted shall set out accurately and completely all of the information required to be maintained under paragraph 2b of this Section V. This information may be submitted in any form desired. Optional Form WH-347 is available for this purpose and may be purchased from the Superintendent of Documents (Federal stock number 029-005-0014-1), U.S. Government Printing Office, Washington, D.C. 20402. The prime contractor is responsible for the submission of copies of payrolls by all subcontractors.
- d. Each payroll submitted shall be accompanied by a "Statement of Compliance," signed by the contractor or subcontractor or his/her agent who pays or supervises the payment of the persons employed under the contract and shall certify the following:
 - (1) that the payroll for the payroll period contains the information required to be maintained under paragraph 2b of this Section V and that such information is correct and complete;
 - (2) that such laborer or mechanic (including each helper, apprentice, and trainee) employed on the contract during the payroll period has been paid the full weekly wages earned, without rebate, either directly or indirectly, and that no deductions have been made either directly or indirectly from the full wages earned, other than permissible deductions as set forth in the Regulations, 29 CFR 3;
 - (3) that each laborer or mechanic has been paid not less than the applicable wage rate and fringe benefits or cash equivalent for the classification of work performed, as specified in the applicable wage determination incorporated into the contract.
- e. The weekly submission of a properly executed certification set forth on the reverse side of Optional Form WH-347 shall satisfy the requirement for submission of the "Statement of Compliance" required by paragraph 2d of this Section V.
- f. The falsification of any of the above certifications may subject the contractor to civil or criminal prosecution under 18 U.S.C. 1001 and 31 U.S.C. 231.
- g. The contractor or subcontractor shall make the records required under paragraph 2b of this Section V available for inspection, copying, or transcription by authorized representatives of the SHA, the FHWA, or the DOL, and shall permit such representatives to interview employees during working hours on the job. If the contractor or subcontractor fails to submit the required records or to make them available, the SHA, the FHWA, the DOL, or all may, after written notice to the contractor, sponsor, applicant, or owner, take such actions as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds. Furthermore, failure to submit the required records upon request or to make such records available may be grounds for debarment action pursuant to 29 CFR 5.12.

VI. RECORD OF MATERIALS, SUPPLIES, AND LABOR

1. On all Federal-aid contracts on the National Highway System, except those which provide solely for the installation of protective devices at railroad grade crossings, those which are constructed on a force account or direct labor basis, highway beautification contracts, and contracts for which the total final construction cost for roadway and bridge is less than \$1,000,000 (23 CFR 635) the contractor shall:

- a. Become familiar with the list of specific materials and supplies contained in Form FHWA-47, "Statement of Materials and Labor Used by Contractor of Highway Construction Involving Federal Funds," prior to the commencement of work under this contract.
- b. Maintain a record of the total cost of all materials and supplies purchased for and incorporated in the work, and also of the quantities of those specific materials and supplies listed on Form FHWA-47, and in the units shown on Form FHWA-47.
- c. Furnish, upon the completion of the contract, to the SHA resident engineer on Form FHWA-47 together with the data required in paragraph 1b relative to materials and supplies, a final labor summary of all contract work indicating the total hours worked and the total amount earned.

2. At the prime contractor's option, either a single report covering all contract work or separate reports for the contractor and for each subcontract shall be submitted.

VII. SUBLETTING OR ASSIGNING THE CONTRACT

1. The contractor shall perform with its own organization contract work amounting to not less than 30 percent (or a greater percentage if specified elsewhere in the contract) of the total original contract price, excluding any specialty items designated by the State. Specialty items may be performed by subcontract and the amount of any such specialty items performed may be deducted from the total original contract price before computing the amount of work required to be performed by the contractor's own organization (23 CFR 635).

- a. "Its own organization" shall be construed to include only workers employed and paid directly by the prime contractor and equipment owned or rented by the prime contractor, with or without operators. Such term does not include employees or equipment of a subcontractor, assignee, or agent of the prime contractor.
 - b. "Specialty Items" shall be construed to be limited to work that requires highly specialized knowledge, abilities, or equipment not ordinarily available in the type of contracting organizations qualified and expected to bid on the contract as a whole and in general are to be limited to minor components of the overall contract.
2. The contract amount upon which the requirements set forth in paragraph 1 of Section VII is computed includes the cost of material and manufactured products which are to be purchased or produced by the contractor under the contract provisions.
3. The contractor shall furnish (a) a competent superintendent or supervisor who is employed by the firm, has full authority to direct performance of the work in accordance with the contract requirements, and is in charge of all construction operations (regardless of who performs the work) and (b) such other of its own organizational resources (supervision, management, and engineering services) as the SHA contracting officer determines is necessary to assure the performance of the contract.
4. No portion of the contract shall be sublet, assigned or otherwise disposed of except with the written consent of the SHA contracting officer, or authorized representative, and such consent when given shall not be construed to relieve the contractor of any responsibility for the fulfillment of the contract. Written consent will be given only after the SHA has assured that each subcontract is evidenced in writing and that it contains all pertinent provisions and requirements of the prime contract.

VIII. SAFETY: ACCIDENT PREVENTION

1. In the performance of this contract the contractor shall comply with all applicable Federal, State, and local laws governing safety, health, and sanitation (23 CFR 635). The contractor shall provide all safeguards, safety devices and protective equipment and take any other needed actions as it determines, or as the SHA contracting officer may determine, to be reasonably necessary to protect the life and health of employees on the job and the safety of the public and to protect property in connection with the performance of the work covered by the contract.
2. It is a condition of this contract, and shall be made a condition of each subcontract, which the contractor enters into pursuant to this contract, that the contractor and any subcontractor shall not permit any employee, in performance of the contract, to work in surroundings or under conditions which are unsanitary, hazardous or dangerous to his/her health or safety, as determined under construction safety and health standards (29 CFR 1926) promulgated by the Secretary of Labor, in accordance with Section 107 of the Contract Work Hours and Safety Standards Act (40 U.S.C. 333).
3. Pursuant to 29 CFR 1926.3, it is a condition of this contract that the Secretary of Labor or authorized representative thereof, shall have right of entry to any site of contract performance to inspect or investigate the matter of compliance with the construction safety and health standards and to carry out the duties of the Secretary under Section 107 of the Contract Work Hours and Safety Standards Act (40 U.S.C. 333).

IX. FALSE STATEMENTS CONCERNING HIGHWAY PROJECTS

In order to assure high quality and durable construction in conformity with approved plans and specifications and a high degree of reliability on statements and representations made by engineers, contractors, suppliers, and workers on Federal-aid highway projects, it is essential that all persons concerned with the project perform their functions as carefully, thoroughly, and honestly as possible. Willful falsification, distortion, or misrepresentation with respect to any facts related to the project is a violation of Federal law. To prevent any misunderstanding regarding the seriousness of these and similar acts, the following notice shall be posted on each Federal-aid highway project (23 CFR 635) in one or more places where it is readily available to all persons concerned with the project:

NOTICE TO ALL PERSONNEL ENGAGED ON FEDERAL-AID HIGHWAY PROJECTS

18 U.S.C. 1020 reads as follows:

"Whoever, being an officer, agent, or employee of the United States, or of any State or Territory, or whoever, whether a person, association, firm, or corporation, knowingly makes any false statement, false representation, or false report as to the character, quality, quantity, or cost of the material used or to be used, or the quantity or quality of the work performed or to be performed, or the cost thereof in connection with the submission of plans, maps, specifications, contracts, or costs of construction on any highway or related project submitted for approval to the Secretary of Transportation; or

Whoever knowingly makes any false statement, false representation, false report or false claim with respect to the character, quality, quantity, or cost of any work performed or to be performed, or materials furnished or to be

*furnished, in connection with the construction of any highway or related project approved by the Secretary of Transportation; or
Whoever knowingly makes any false statement or false representation as to material fact in any statement, certificate, or report submitted pursuant to provisions of the Federal-aid Roads Act approved July 1, 1916, (39 Stat. 355), as amended and supplemented;*

Shall be fined not more than \$10,000 or imprisoned not more than 5 years or both."

X. IMPLEMENTATION OF CLEAN AIR ACT AND FEDERAL WATER POLLUTION CONTROL ACT

(Applicable to all Federal-aid construction contracts and to all related subcontracts of \$100,000 or more.)

By submission of this bid or the execution of this contract, or subcontract, as appropriate, the bidder, Federal-aid construction contractor, or subcontractor, as appropriate, will be deemed to have stipulated as follows:

1. That any facility that is or will be utilized in the performance of this contract, unless such contract is exempt under the Clean Air Act, as amended (42 U.S.C. 1857 *et seq.*, as amended by Pub.L. 91-604), and under the Federal Water Pollution Control Act, as amended (33 U.S.C. 1251 *et seq.*, as amended by Pub.L. 92-500), Executive Order 11738, and regulations in implementation thereof (40 CFR 15) is not listed, on the date of contract award, on the U.S. Environmental Protection Agency (EPA) List of Violating Facilities pursuant to 40 CFR 15.20.
2. That the firm agrees to comply and remain in compliance with all the requirements of Section 114 of the Clean Air Act and Section 308 of the Federal Water Pollution Control Act and all regulations and guidelines listed thereunder.
3. That the firm shall promptly notify the SHA of the receipt of any communication from the Director, Office of Federal Activities, EPA, indicating that a facility that is or will be utilized for the contract is under consideration to be listed on the EPA List of Violating Facilities.
4. That the firm agrees to include or cause to be included the requirements of paragraph 1 through 4 of this Section X in every nonexempt subcontract, and further agrees to take such action as the government may direct as a means of enforcing such requirements.

XI. CERTIFICATION REGARDING DEBARMENT, SUSPENSION, ELIGIBILITY AND VOLUNTARY EXCLUSION

1. Instructions for Certification - Primary Covered Transactions:

(Applicable to all Federal-aid contracts - 49 CFR 29)

- a. By signing and submitting this proposal, the prospective primary participant is providing the certification set out below.
- b. The inability of a person to provide the certification set out below will not necessarily result in denial of participation in this covered transaction. The prospective participant shall submit an explanation of why it cannot provide the certification set out below. The certification or explanation will be considered in connection with the department or agency's determination whether to enter into this transaction. However, failure of the prospective primary participant to furnish a certification or an explanation shall disqualify such a person from participation in this transaction.
- c. The certification in this clause is a material representation of fact upon which reliance was placed when the department or agency determined to enter into this transaction. If it is later determined that the prospective primary participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government, the department or agency may terminate this transaction for cause of default.
- d. The prospective primary participant shall provide immediate written notice to the department or agency to whom this proposal is submitted if any time the prospective primary participant learns that its certification was erroneous when submitted or has become erroneous by reason of changed circumstances.
- e. The terms "covered transaction," "debarred," "suspended," "ineligible," "lower tier covered transaction," "participant," "person," "primary covered transaction," "principal," "proposal," and "voluntarily excluded," as used in this clause, have the meanings set out in the Definitions and Coverage sections of rules implementing Executive Order 12549. You may contact the department or agency to which this proposal is submitted for assistance in obtaining a copy of those regulations.
- f. The prospective primary participant agrees by submitting this proposal that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized by the department or agency entering into this transaction.
- g. The prospective primary participant further agrees by submitting this proposal that it will include the clause titled "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion-Lower Tier Covered Transaction," provided by the department or agency entering into this covered transaction, without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions.

- h. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. A participant may decide the method and frequency by which it determines the eligibility of its principals. Each participant may, but is not required to, check the nonprocurement portion of the "Lists of Parties Excluded From Federal Procurement or Nonprocurement Programs" (Nonprocurement List) which is compiled by the General Services Administration.
- i. Nothing contained in the foregoing shall be construed to require establishment of a system of records in order to render in good faith the certification required by this clause. The knowledge and information of participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.
- j. Except for transactions authorized under paragraph f of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to other remedies available to the Federal Government, the department or agency may terminate this transaction for cause or default.

* * * * *

Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion-- Primary Covered Transactions

1. The prospective primary participant certifies to the best of its knowledge and belief, that it and its principals:
 - a. Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from covered transactions by any Federal department or agency;
 - b. Have not within a 3-year period preceding this proposal been convicted of or had a civil judgement rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State or local) transaction or contract under a public transaction; violation of Federal or State antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property;
 - c. Are not presently indicted for or otherwise criminally or civilly charged by a governmental entity (Federal, State or local) with commission of any of the offenses enumerated in paragraph 1b of this certification; and
 - d. Have not within a 3-year period preceding this application/proposal had one or more public transactions (Federal, State or local) terminated for cause or default.
2. Where the prospective primary participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

* * * * *

2. Instructions for Certification - Lower Tier Covered Transactions:

(Applicable to all subcontracts, purchase orders and other lower tier transactions of \$25,000 or more - 49 CFR 29)

- a. By signing and submitting this proposal, the prospective lower tier is providing the certification set out below.
- b. The certification in this clause is a material representation of fact upon which reliance was placed when this transaction was entered into. If it is later determined that the prospective lower tier participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government, the department, or agency with which this transaction originated may pursue available remedies, including suspension and/or debarment.
- c. The prospective lower tier participant shall provide immediate written notice to the person to which this proposal is submitted if at any time the prospective lower tier participant learns that its certification was erroneous by reason of changed circumstances.
- d. The terms "covered transaction," "debarred," "suspended," "ineligible," "primary covered transaction," "participant," "person," "principal," "proposal," and "voluntarily excluded," as used in this clause, have the meanings set out in the Definitions and Coverage sections of rules implementing Executive Order 12549. You may contact the person to which this proposal is submitted for assistance in obtaining a copy of those regulations.
- e. The prospective lower tier participant agrees by submitting this proposal that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared

ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized by the department or agency with which this transaction originated.

- f. The prospective lower tier participant further agrees by submitting this proposal that it will include this clause titled "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion-Lower Tier Covered Transaction," without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions.
- g. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. A participant may decide the method and frequency by which it determines the eligibility of its principals. Each participant may, but is not required to, check the Nonprocurement List.
- h. Nothing contained in the foregoing shall be construed to require establishment of a system of records in order to render in good faith the certification required by this clause. The knowledge and information of participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.
- i. Except for transactions authorized under paragraph e of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to other remedies available to the Federal Government, the department or agency with which this transaction originated may pursue available remedies, including suspension and/or debarment.

* * * * *

**Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion—
Lower Tier Covered Transactions:**

- 1. The prospective lower tier participant certifies, by submission of this proposal, that neither it nor its principals is presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participation in this transaction by any Federal department or agency.
- 2. Where the prospective lower tier participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

* * * * *

XII. CERTIFICATION REGARDING USE OF CONTRACT FUNDS FOR LOBBYING

(Applicable to all Federal-aid construction contracts and to all related subcontracts which exceed \$100,000 - 49 CFR 20)

- 1. The prospective participant certifies, by signing and submitting this bid or proposal, to the best of his or her knowledge and belief, that:
 - a. No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.
 - b. If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.
- 2. This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by 31 U.S.C. 1352. Any person who fails to file the required certification shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.
- 3. The prospective participant also agrees by submitting his or her bid or proposal that he or she shall require that the language of this certification be included in all lower tier subcontracts, which exceed \$100,000 and that all such recipients shall certify and disclose accordingly.

STATE**OF****TENNESSEE**

March 1, 2006

CERTIFICATION REGARDING
DEBARMENT, SUSPENSION, AND OTHER RESPONSIBILITY MATTERS
PRIMARY AND LOWER TIER COVERED TRANSACTIONS

The prospective Primary and/or Lower Tier participant certifies, by signing and submitting this proposal, to the best of its knowledge and belief, that it and its principals:

Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from covered transactions by any Federal, State or local department or agency.

Have not within a three-year period preceding this proposal been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State or local) transaction or contract under a public transaction; violation of Federal or State antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property.

Are not presently indicted for or otherwise criminally or civilly charged by a governmental entity (Federal, State or local) with commission of any of the offenses enumerated in the preceding paragraph of this certification; and

Have not within a three- year period preceding this application/proposal had one or more public transactions (Federal, State, or local) terminated for cause or default.

Where the prospective Primary and/or Lower Tier participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

(Exceptions to the above are to be submitted on a separate sheet with the bid proposal)

For any exception noted, indicate to whom it applies, initiating agency, and dates of action. Providing false information may result in criminal prosecution or administrative sanctions.

STATE**OF****TENNESSEE**

March 1, 2006

SPECIAL PROVISION**REGARDING****NON-DISCRIMINATION IN EMPLOYMENT**

Bidders are cautioned as follows:

By signing this bid, the bidder will be deemed to have signed and agreed that all persons, firms or corporations supplying goods, material, equipment or service of any kind to the State of Tennessee will not discriminate against any employee or applicant for employment on the basis of handicap, race, religion, national origin or sex and further, that while under contract with the State will show proof upon request that all employment practices including, but not limited to, promotion, rates of pay, transfers, recruitment, recruitment advertising, terminations, layoffs and training and apprenticeship programs are not discriminatory in nature. Each contractor shall be required to post in conspicuous places, available to all employees and applicants for employment, notices of non-discrimination.

S T A T E

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T E N N E S S E E

March 1, 2006

(Rev. 12-21-10)

(Rev. 09-12-11)

(Rev. 12-15-11)

(Rev. 01-11-12)

SPECIAL PROVISION

REGARDING

TENNESSEE DEPARTMENT OF TRANSPORTATION

2012 MINIMUM WAGE SCALES FOR FEDERAL-AID CONSTRUCTION

& 2012 MINIMUM WAGE SCALES FOR STATE FUNDED CONSTRUCTION

This Contract contains "Tennessee Department of Transportation 2012 Minimum Wage Scales for State Funded Construction", Tennessee Department of Labor Decision No. T-33823, dated December 15, 2011, and Tennessee Department of Transportation 2012 Minimum Wage Scales for Federal-Aid Highway Construction, U. S. Department of Labor Decision No. TN120002 (dated January 6, 2012).

The Contractor is required to pay the greater of the two (2) rates for each classification.

Note: Minimum Wage Scales for Federal-Aid Heavy Construction are on file with the Department, and will be included in all applicable Contract Proposals.

(Rev. 01-11-12)

STATE

OF

TENNESSEE

TENNESSEE DEPARTMENT OF TRANSPORTATION

MINIMUM WAGE SCALES FOR FEDERAL AID HIGHWAY CONSTRUCTION

Publication Date: January 6, 2012

General Decision Number: **TN120002**

Modification No.: 0

Superseded General Decision No.: TN20100002

Construction Types: Highway

Counties: Tennessee Statewide

HIGHWAY CONSTRUCTION PROJECTS : (excluding tunnels, building structures in rest area projects & railroad construction; bascule, suspension & spandrel arch bridges designed for commercial navigation, bridges involving marine construction; and other major bridges).

<u>CLASSIFICATION</u>	<u>Rates</u>
Bricklayer	\$16.62
Carpenter	\$16.10
Cement Mason/Concrete Finisher	\$13.91
Electrician	\$21.62
Ironworkers	
-Reinforcing	\$15.90
-Structural	\$17.15
Traffic Controller	\$16.98
Painter & Sandblaster	\$21.54
Powder Person	\$17.79
Power Equipment Operators	
- Group 1	\$17.14
- Group 2	\$15.26
- Group 3	\$15.75
- Group 4	\$14.19
Drill Operator (Caisson)	\$18.43
Farm Tractor Operator (Power Broom)	\$12.58
Sweeping Machine (Vacuum) Operator	\$13.39
Heavy Duty Mechanic	\$18.04
Light Duty Mechanic	\$16.27
Truck Drivers	
- 2 Axles	\$13.02
- 3 - 4 Axles	\$12.91
- 5 or more Axles	\$15.24
- Heavy Duty Off-Road	\$12.98
Laborers	
- Common/Unskilled	\$11.50
- Skilled	\$13.34

WELDERS - Receive rate prescribed for craft performing operation to which welding is incidental.

LABORER CLASSIFICATIONS

Skilled Laborers: Air tool operator, Asphalt Raker, Chain saw operator, Concrete Mixer (Less than 1 yard), Concrete Rubber, Edger, Fence Erector, Form Setter (Steel), Guard Rail Erector, Mechanic's Tender (Tire Changer or Oiler), Mortar Mixer, Nozzleman or Gun Operator (Gunitite), Pipelayer, Sign Erector.

POWER EQUIPMENT OPERATOR CLASSIFICATIONS

GROUP 1: Backhoe/Hydraulic Excavator (3/4 yard & over), Crane, End Loader (3 yards & over), Motor Patrol (Rough), Tractor (Crawler/Utility), Scraper, Shovel, Trenching Machine.

GROUP 2: Backhoe/Hydraulic Excavator (Less than 3/4 yard), Bull dozer or Push dozer, End Loader (Less than 3 yards), Motor Patrol (Rough), Tractor (Crawler/Utility), Scraper, Shovel, Trenching Machine.

GROUP 3: Asphalt Paver, Concrete Finishing Machine, Concrete Paver, Scale, Spreader (Self-Propelled), Concrete Grinder, Asphalt Milling Machine, Boring Machine Operator (Horizontal).

GROUP 4: Bobcat, Central Mining Plant, Concrete Pump, Concrete Saw, Curb machine (Automatic or Manual), Dozer or Loader (Stockpile), Drill(piling), Mulcher or Seeder, Rock Drill (truck mounted), Roller (asphalt), Roller(compaction self-propelled), Soil Stabilization Machine, Tractor (boom & hoist), Bituminous Distributor Machine, Pump, Track Drill, Striping Machine

STATEOFTENNESSEETENNESSEE DEPARTMENT OF TRANSPORTATION2012 MINIMUM WAGE SCALES FOR STATE FUNDED CONSTRUCTION

December 15, 2011

Tenn. DOL Decision No. T-33823

CLASSIFICATION (ENGLISH)	CLASSIFICATION (SPANISH)	Basic Hourly Rates	Craft No.
Bricklayer	Ladrillero	19.82	01
Carpenter / Leadsperson	Carpintero o Lider	16.33	02
Class "A" Operators	Operador Clase A	17.98	03
Class "B" Operators	Operador Clase B	15.74	04
Class "C" Operators	Operador Clase C	16.55	05
Class "D" Operators	Operador Clase D	15.44	06
Concrete Finisher	Terminador de Cemento	14.70	07
Drill Operator (Caisson)	Operador de Perfordora	23.13	08
Electrician	Electricista	21.35	09
Farm Tractor Operator (Power Broom)	Operador de Tractor de Rancho	12.77	10
Ironworkers (Reinforcing)	Herrero	15.86	11
Ironworkers (Structural)	Herrero de Estructura	16.60	12
Mechanic (Class I) Heavy Duty	Mecanico Clase 1	20.05	13
Mechanic (Class II) Light Duty	Mecanico Clase 2	18.24	14
Painter / Sandblaster	Pintor o Lajador	23.08	15
Powder Person / Blaster	Proveedor de Explosivos	18.84	16
Skilled Laborer	Obrero Diestro	14.51	17
Survey Instrument Operator	Operador de Agrimensor	23.54	18
Sweeping Machine (Vacuum) Operator	Operador de Barredora	14.35	19
Truck Driver (2 axles)	Camionero (2 ejes)	14.37	20
Truck Driver (3/4 axles)	Camionero (3 o 4 ejes)	13.79	21
Truck Driver (5 or more axles)	Camionero (5 o más ejes)	16.13	22
Laborer /Unskilled , Flagger, Traffic Control, Pickup Driver	Obrero no Diestro	12.41	23
Worksite Traffic Coordinator	Coordinar de Trafico en el Lugar de Trabajo	18.17	24

CLASSIFICATION

CRAFT NO.

SKILLED LABORER:

17

Air Tool Operator, Asphalt Raker, Chain Saw Operator, Concrete Mixer Operator (less than 1 yard), Concrete Rubber/Edger, Fence Erector, Form Setter (Steel Road), Guardrail Erector, Mechanic's Helper (Tire Changer or Oiler), Mortar Mixer, Nozzelman or Gun Operator (Gunitite), *Pipelayer, Sign Erector

CLASS "A" OPERATORS:

03

Backhoe/Hydraulic Excavator (3/4 yard and over), Crane, End Loader (3 yards and over), Motor Patrol (Finish), Pile Driver, Dragline

CLASS "B" OPERATORS:

04

Backhoe/Hydraulic Excavator (less than 3/4 yard), Bull Dozer or Push Dozer, End Loader (less than 3 yards), Motor Patrol (Rough), Tractor (Crawler/Utility), Scraper, Shovel, Trenching Machine, Truck Driver (Heavy Duty, Off- Road)

CLASS "C" OPERATORS:

05

Asphalt Paver, Concrete Finishing Machine, Concrete Paver, Scale, Spreader (Self-Propelled), Concrete Grinder, Asphalt Milling Machine, Boring Machine Operator (Horizontal)

CLASS "D" OPERATORS:

06

Bobcat, Central Mixing Plant, Concrete Pump, Concrete Saw, Curb Machine (Automatic or Manual), Dozer or Loader (Stockpile), Drill (Piling), Mulcher or Seeder, Rock Drill (Truck Mounted), Roller (Asphalt), Roller (Compaction Self-Propelled), Soil Stabilization Machine, Tractor (Boom & Hoist), Bituminous Distributor Machine, Pump, Track Drill, Stripping Machine Operator, Ditch Paving Machine

***Skilled Laborer - Pipelayer Classification**

For any work where prevailing wage rates apply which is located five feet or more outside the actual building if building construction is involved:

AND

- (a) which consists of the building, rebuilding, locating, relocating or repairing any street, highway, bridges, water lines, sewer lines, gas lines, force mains or other related utilities**

OR

- (b) which involves the construction or upgrading of industrial parks or sites and is located outside the five foot limitation.**

The classification of pipelayer shall be applicable and the description of work under this classification shall be as follows:

Lays, connects, inspects and tests water lines, force mains, gas lines, sanitary or storm sewers and drains, underground telephone and electric ducts or other utilities manufactured from clay, concrete, steel, plastic, cast iron pipe or other similar materials.

May smooth bottom of trench to proper elevation by scooping with a shovel; receives pipe lowered from top of trench; inserts spigot end of pipe into bell end of last laid pipe; adjusts pipe to line and grades, caulks and seals joint with cement or other sealing compound; may connect threaded or flanged joint pipe; may assemble and place corrugated metal or plastic pipe and performs other related duties.

Additional Information :

Wage Rates : <http://www.tennessee.gov/labor-wfd/prevail.html>

Poster Page : <http://www.state.tn.us/labor-wfd/poster.htm>

Note: Adobe Acrobat Reader is required in order to download & print. If you do not have this software a link is provided at the bottom of the Poster Page for a free download.

Tenn.Dept. of Labor & Workforce Development (Labor Standards Division) : (615) 741-2858.

APPRENTICESHIP REGULATIONS:

Under T.C.A., §12-449, the Prevailing Wage Commission has promulgated Rule 0800-3-2-.04 which provides that: "Apprentices shall mean those persons registered individually under a bona fide apprenticeship program registered with the Bureau of Apprentiship and Training in the United States Department of Labor. The state agency contracting officer shall require the contractor or sub-contractor using the apprentice to submit evidence of his indenture and/or apprenticeship registration when the apprentice's name first appears on a submitting payroll."

AUTHORITY: T.C.A., §12-449. Administrative History: Original Rule filed June 4, 1976. Effective: July 14, 1976.

§18.42 Retention and access requirements for records.

a. *Applicability.*

1. This section applies to all financial and programmatic records, supporting documents, statistical records, and other records of grantees or subgrantees which are:
 - i. Required to be maintained by the terms of this part, program regulations or the grant agreement, or
 - ii. Otherwise reasonably considered as pertinent to program regulations or the grant agreement.
2. This section does not apply to records maintained by contractors or subcontractors. For a requirement to place a provision concerning records in certain kinds of contracts, see §18.36(i)(10).

b. *Length of retention period.*

1. Except as otherwise provided, records must be retained for three years from the starting date specified in paragraph (c) of this section.
2. If any litigation, claim, negotiation, audit or other action involving the records has been started before the expiration of the 3-year period, the records must be retained until completion of the action and resolution of all issues which arise from it, or until the end of the regular 3-year period, whichever is later.
3. To avoid duplicate recordkeeping, awarding agencies may make special arrangements with grantees and subgrantees to retain any records which are continuously needed for joint use. The awarding agency will request transfer of records to its custody when it determines that the records possess long-term retention value. When the records are transferred to or maintained by the Federal agency, the 3-year retention requirement is not applicable to the grantee or subgrantee.

c. *Starting date of retention period --*

1. *General.* When grant support is continued or renewed at annual or other intervals, the retention period for the records of each funding period starts on the day the grantee or subgrantee submits to the awarding agency its single or last expenditure report for that period. However, if grant support is continued or renewed quarterly, the retention period for each year's records starts on the day the grantee submits its expenditure report for the last quarter of the Federal fiscal year. In all other cases, the retention period starts on the day the grantee submits its final expenditure report. If an expenditure report has been waived, the retention period starts on the day the report would have been due.
2. *Real property and equipment records.* The retention period for real property and equipment records starts from the date of the disposition or replacement or transfer at the direction of the awarding agency.
3. *Records for income transactions after grant or subgrant support.* In some cases grantees must report income after the period of grant support. Where there is such a requirement, the retention period for the records pertaining to the earning of the income starts from the end of the grantee's fiscal year in which the income is earned.
4. *Indirect cost rate proposals, cost allocations plans, etc.* This paragraph applies to the following types of documents, and their supporting records: indirect cost rate computations or proposals, cost allocation plans, and any similar accounting computations of the rate at which a particular group of costs is chargeable (such as computer usage chargeback rates or composite fringe benefit rates).
 - i. *If submitted for negotiation.* If the proposal, plan, or other computation is required to be submitted to the Federal Government (or to the grantee) to form the basis for negotiation of the rate, then the 3-year retention period for its supporting records starts from the date of such submission.
 - ii. *If not submitted for negotiation.* If the proposal, plan, or other computation is not required to be submitted to the Federal Government (or to the grantee) for negotiation purposes, then the 3-year retention period for the proposal plan, or computation and its supporting records starts from the end of the fiscal year (or other accounting period) covered by the proposal, plan, or other computation.

d. *Substitution of microfilm.* Copies made by microfilming, photocopying, or similar methods may be substituted for the original records.

e. *Access to records --*

1. *Records of grantees and subgrantees.* The awarding agency and the Comptroller General of the United States, or any of their authorized representatives, shall have the right of access to any pertinent books, documents, papers, or other records of grantees

- and subgrantees which are pertinent to the grant, in order to make audits, examinations, excerpts, and transcripts.
2. *Expiration of right of access.* The right of access in this section must not be limited to the required retention period but shall last as long as the records are retained.
- f. *Restrictions on public access.* The Federal Freedom of Information Act (5 U.S.C. 552) does not apply to records unless required by Federal, State, or local law, grantees and subgrantees are not required to permit public access to their records.

§18.36 Procurement.

- i. *Contract provisions.* A grantee's and subgrantee's contracts must contain provisions in paragraph (i) of this section. Federal agencies are permitted to require changes, remedies, changed conditions, access and records retention, suspension of work, and other clauses approved by the Office of Federal Procurement Policy.
1. Administrative, contractual, or legal remedies in instances where contractors violate or breach contract terms, and provide for such sanctions and penalties as may be appropriate. (Contracts more than the simplified acquisition threshold)
 2. Termination for cause and for convenience by the grantee or subgrantee including the manner by which it will be effected and the basis for settlement. (All contracts in excess of \$10,000)
 3. Compliance with Executive Order 11246 of September 24, 1965, entitled "Equal Employment Opportunity," as amended by Executive Order 11375 of October 13, 1967, and as supplemented in Department of Labor regulations (41 CFR chapter 60). (All construction contracts awarded in excess of \$10,000 by grantees and their contractors or subgrantees)
 4. Compliance with the Copeland "Anti-Kickback" Act (18 U.S.C. 874) as supplemented in Department of Labor regulations (29 CFR part 3). (All contracts and subgrants for construction or repair)
 5. Compliance with the Davis-Bacon Act (40 U.S.C. 276a to 276a-7) as supplemented by Department of Labor regulations (29 CFR part 5). (Construction contracts in excess of \$2000 awarded by grantees and subgrantees when required by Federal grant program legislation)
 6. Compliance with Sections 103 and 107 of the Contract Work Hours and Safety Standards Act (40 U.S.C. 327-330) as supplemented by Department of Labor regulations (29 CFR part 5). (Construction contracts awarded by grantees and subgrantees in excess of \$2000, and in excess of \$2500 for other contracts which involve the employment of mechanics or laborers)
 7. Notice of awarding agency requirements and regulations pertaining to reporting.
 8. Notice of awarding agency requirements and regulations pertaining to patent rights with respect to any discovery or invention which arises or is developed in the course of or under such contract.
 9. Awarding agency requirements and regulations pertaining to copyrights and rights in data.
 10. Access by the grantee, the subgrantee, the Federal grantor agency, the Comptroller General of the United States, or any of their duly authorized representatives to any books, documents, papers, and records of the contractor which are directly pertinent to that specific contract for the purpose of making audit, examination, excerpts, and transcriptions.
 11. Retention of all required records for three years after grantees or subgrantees make final payments and all other pending matters are closed.
 12. Compliance with all applicable standards, orders, or requirements issued under section 306 of the Clean Air Act (42 U.S.C. 1857(h)), section 508 of the Clean Water Act (33 U.S.C. 1368), Executive Order 11738, and Environmental Protection Agency regulations (40 CFR part 15). (Contracts, subcontracts, and subgrants of amounts in excess of \$100,000)
 13. Mandatory standards and policies relating to energy efficiency which are contained in the state energy conservation plan issued in compliance with the Energy Policy and Conservation Act (Pub. L. 94-163, 89 Stat. 871).

§18.26 Non-Federal audits.

- a. *Basic rule.* Grantees and subgrantees are responsible for obtaining audits in accordance with the Single Audit Act Amendments of 1996 (31 U.S.C. 7501-7507) and revised OMB Circular A-133, "Audits of States, Local Governments, and Non-Profit Organizations." The audits shall be made by an independent auditor in accordance with generally accepted government auditing standards covering financial audits.
- b. *Subgrantees.* State or local governments, as those terms are defined for purposes of the Single Audit Act Amendments of 1996, that provide Federal awards to a subgrantee, which expends \$300,000 or more (or other amount as specified by OMB) in Federal awards in a fiscal year, shall:
 - 1. Determine whether State or local subgrantees have met the audit requirements of the Act and whether subgrantees covered by OMB Circular A-110, "Uniform Administrative Requirements for Grants and Agreements with Institutions of Higher Education, Hospitals, and Other Non-Profit Organizations," have met the audit requirements of the Act. Commercial contractors (private for-profit and private and governmental organizations) providing goods and services to State and local governments are not required to have a single audit performed. State and local governments should use their own procedures to ensure that the contractor has complied with laws and regulations affecting the expenditure of Federal funds;
 - 2. Determine whether the subgrantee spent Federal assistance funds provided in accordance with applicable laws and regulations. This may be accomplished by reviewing an audit of the subgrantee made in accordance with the Act, Circular A-110, or through other means (e.g., program reviews) if the subgrantee has not had such an audit;
 - 3. Ensure that appropriate corrective action is taken within six months after receipt of the audit report in instance of noncompliance with Federal laws and regulations;
 - 4. Consider whether subgrantee audits necessitate adjustment of the grantee's own records; and
 - 5. Require each subgrantee to permit independent auditors to have access to the records and financial statements.
- c. *Auditor selection.* In arranging for audit services, §18.36 shall be followed.

Federal Highway Administration
Department of Transportation
Required Contract Provisions

PART 635-CONSTRUCTION AND MAINTENANCE

§ 635.108 Health and safety.

Contracts for projects shall include provisions designed:

- (a) To insure full compliance with all applicable Federal, State, and local laws governing safety, health and sanitation; and
- (b) To require that the contractor shall provide all safeguards, safety devices, and protective equipment and shall take any other actions reasonably necessary to protect the life and health of persons working at the site of the project and the safety of the public and to protect property in connection with the performance of the work covered by the contract.

§635.109 Standardized changed condition clauses.

(a) Except as provided in paragraph (b) of this section, the following changed conditions contract clauses shall be made part of, and incorporated in, each highway construction project approved under 23 U.S.C. 106:

(1) Differing site conditions.

(i) During the progress of the work, if subsurface or latent physical conditions are encountered at the site differing materially from those indicated in the contract or if unknown physical conditions of an unusual nature, differing materially from those ordinarily encountered and generally recognized as inherent in the work provided for in the contract, are encountered at the site, the party discovering such conditions shall promptly notify the other party in writing of the specific differing conditions before the site is disturbed and before the affected work is performed.

(ii) Upon written notification, the engineer will investigate the conditions, and if it is determined that the conditions materially differ and cause an increase or decrease in the cost or time required for the performance of any work under the contract, an adjustment, excluding anticipated profits, will be made and the contract modified in writing accordingly. The engineer will notify the contractor of the determination whether or not an adjustment of the contract is warranted.

(iii) No contract adjustment which results in a benefit to the contractor will be allowed unless the contractor has provided the required written notice.

(iv) No contract adjustment will be allowed under this clause for any effects caused on unchanged work. (This provision may be omitted by the STD's at their option.)

(2) Suspensions of work ordered by the engineer.

(i) If the performance of all or any portion of the work is suspended or delayed by the engineer in writing for an unreasonable period of time (not originally anticipated, customary, or inherent to the construction industry) and the contractor believes that additional compensation and/ or contract time is due as a result of such suspension or delay, the contractor shall submit to the engineer in writing a request for adjustment within 7 calendar days of receipt of the notice to resume work. The request shall set forth the reasons and support for such adjustment.

(ii) Upon receipt, the engineer will evaluate the contractor's request. If the engineer agrees that the cost and/or time required for the performance of the contract has increased as a result of such suspension and the suspension was caused by conditions beyond the control of and not the fault of the contractor, its suppliers, or subcontractors at any approved tier, and not caused by weather, the engineer will make an adjustment (excluding profit) and modify the contract in writing accordingly. The contractor will be notified of the engineer's determination whether or not an adjustment of the contract is warranted.

(iii) No contract adjustment will be allowed unless the contractor has submitted the request for adjustment within the time prescribed.

(iv) No contract adjustment will be allowed under this clause to the extent that performance would have been suspended or delayed by any other cause, or for which an adjustment is provided or excluded under any other term or condition of this contract.

(3) Significant changes in the character of work.

(i) The engineer reserves the right to make, in writing, at any time during the work, such changes in quantities and such alterations in the work as are necessary to satisfactorily complete the project. Such changes in quantities and alterations shall not invalidate the contract nor release the surety, and the contractor agrees to perform the work as altered.

(ii) If the alterations or changes in quantities significantly change the character of the work under the contract, whether such alterations or changes are in themselves significant changes to the character of the work or by affecting other work cause such other work to become significantly different in character, an adjustment, excluding anticipated profit, will be made to the contract. The basis for the adjustment shall be agreed upon prior to the performance of the work. If a basis cannot be agreed upon, then an adjustment will be made either for or against the contractor in such amount as the engineer may determine to be fair and equitable.

(iii) If the alterations or changes in quantities do not significantly change the character of the work to be performed under the contract, the altered work will be paid for as provided elsewhere in the contract.

(iv) The term "significant change" shall be construed to apply only to the following circumstances:

(A) When the character of the work as altered differs materially in kind or nature from that involved or included in the original proposed construction; or

(B) When a major item of work, as defined elsewhere in the contract, is increased in excess of 125 percent or decreased below 75 percent of the original contract quantity. Any allowance for an increase in quantity shall apply only to that portion in excess of 125 percent of original contract item quantity, or in case of a decrease below 75 percent, to the actual amount of work performed.

(b) The provisions of this section shall be governed by the following:

(1) Where State statute does not permit one or more of the contract clauses included in paragraph (2) of this section, the State statute shall prevail and such clause or clauses need not be made applicable to Federal-aid highway contracts.

(2) Where the State transportation department has developed and implemented one or more of the contract clauses included in paragraph (a) of this section, such clause or clauses, as developed by the State transportation department may be included in Federal-aid highway contracts in lieu of the

corresponding clause or clauses in paragraph (a) of this section. The State's action must be pursuant to a specific State statute requiring differing contract conditions clauses. Such State developed clause or clauses, however, must be in conformance with 23 U.S.C., 23 CFR and other applicable Federal statutes and regulations as appropriate and shall be subject to the Division Administrator's approval as part of the PS&E.

(c) In the case of a design-build project, STDs are strongly encouraged to use "suspensions of work ordered by the engineer" clauses, and may consider "differing site condition" clauses and "significant changes in the character of work" clauses which are appropriate for the risk and responsibilities that are shared with the design-builder.

§635.112 Advertising for bids and proposals.

f) The STD shall include a noncollusion provision substantially as follows in the bidding documents:

Each bidder shall file a statement executed by, or on behalf of the person, firm, association, or corporation submitting the bid certifying that such person, firm, association, or corporation has not, either directly or indirectly, entered into any agreement, participated in any collusion, or otherwise taken any action, in restraint of free competitive bidding in connection with the submitted bid. Failure to submit the executed statement as part of the bidding documents will make the bid nonresponsive and not eligible for award consideration.

§635.116 Subcontracting and contractor responsibilities.

(a) Contracts for projects shall specify the minimum percentage of work that a contractor must perform with its own organization. This percentage shall be not less than 30 percent of the total original contract price excluding any identified specialty items. Specialty items may be performed by subcontract and the amount of any such specialty items so performed may be deducted from the total original contract before computing the amount of work required to be performed by the contractor's own organization. The contract amount upon which the above requirement is computed includes the cost of materials and manufactured products which are to be purchased or produced by the contractor under the contract provisions.

(b) The STD shall not permit any of the contract work to be performed under a subcontract, unless such arrangement has been authorized by the STD in writing. Prior to authorizing a subcontract, the STD shall assure that each subcontract is evidenced in writing and that it contains all pertinent provisions and requirements of the prime contract. The Division Administrator may permit the STD to satisfy the subcontract assurance requirements by concurrence in a STD process which requires the contractor to certify that each subcontract arrangement will be in the form of a written agreement containing all the requirements and pertinent provisions of the prime contract. Prior to the Division Administrator's concurrence, the STD must demonstrate that it has an acceptable plan for monitoring such certifications.

(c) To assure that all work (including subcontract work) is performed in accordance with the contract requirements, the contractor shall be required to furnish:

(1) A competent superintendent or supervisor who is employed by the firm, has full authority to direct performance of the work in accordance with the contract requirements, and is in charge of all construction operations (regardless of who performs the work), and;

(2) Such other of its own organizational resources (supervision, management, and engineering services) as the STD contracting officer determines are necessary to assure the performance of the contract.

(d) In the case of a design-build project, the following requirements apply:

(1) The provisions of paragraph (a) of this section are not applicable to design-build contracts;

(2) At their discretion, the STDs may establish a minimum percentage of work that must be done by the design-builder. For the purpose of this section, the term design-builder may include any firms that are equity participants in the design-builder, their sister and parent companies, and their wholly owned subsidiaries;

(3) No procedure, requirement or preference shall be imposed which prescribes minimum subcontracting requirements or goals (other than those necessary to meet the Disadvantaged Business Enterprise program requirements of 49 CFR part 26).

§ 635.117 Labor and employment.

(a) No construction work shall be performed by convict labor at the work site or within the limits of any Federal-aid highway construction project from the time of award of the contract or the start of work on force account until final acceptance of the work by the STD unless it is labor performed by convicts who are on parole, supervised release, or probation.

(b) No procedures or requirement shall be imposed by any State which will operate to discriminate against the employment of labor from any other State, possession or territory of the United States, in the construction of a Federal-aid project.

(c) The selection of labor to be employed by the contractor on any Federal-aid project shall be by the contractor without regard to race, color, religion, sex, national origin, age, or handicap and in accordance with 23 CFR part 230, 41 CFR part 60 and Exec. Order No. 11246 (Sept. 24, 1965), 3 CFR 339 (1964-1965), as amended.

(d) Pursuant to 23 U.S.C. 140(d), it is permissible for STD's to implement procedures or requirements which will extend preferential employment to Indians living on or near a reservation on eligible projects as defined in paragraph (e) of this section. Indian preference shall be applied without regard to tribal affiliation or place of enrollment. In no instance should a contractor be compelled to layoff or terminate a permanent core-crew employee to meet a preference goal.

(e) Projects eligible for Indian employment preference consideration are projects located on roads within or providing access to an Indian reservation or other Indian lands as defined under the term "Indian Reservation Roads" in 23 U.S.C. 101 and regulations issued there under. The terminus of a road "providing access to" is that point at which it intersects with a road functionally classified as a collector or higher classification (outside the reservation boundary) in both urban and rural areas. In the case of an Interstate highway, the terminus is the first interchange outside the reservation.

(f) The advertisement or call for bids on any contract for the construction of a project located on the Federal-aid system either shall include the minimum wage rates determined by the Secretary of Labor to be prevailing on the same type of work on similar construction in the immediate locality or shall provide that such rates are set out in the bidding documents and shall further specify that such rates are a part of the contract covering the project.

§ 635.125 Termination of contract.

(a) All contracts exceeding \$10,000 shall contain suitable provisions for termination by the State, including the manner by which the termination will be effected and the basis for settlement. In addition, such contracts shall describe conditions under which the contract may be terminated for default as well as conditions where the contract may be terminated because of circumstances beyond the control of the contractor.

(b) The STD prior to termination of a Federal-aid contract shall consult with and receive the concurrence of the Division Administrator. The extent of Federal-aid participation in contract termination costs, including final settlement, will depend upon the merits of the individual case. However, under no circumstances shall Federal funds participate in anticipated profit on work not performed.

(c) Except as provided for in paragraph (e) of this section, normal Federal-aid plans, specifications, and estimates, advertising, and award procedures are to be followed when a STD awards the contract for completion of a terminated Federal-aid contract.

(d) When a STD awards the contract for completion of a Federal-aid contract previously terminated for default, the construction amount eligible for Federal participation on the project should not exceed whichever amount is the lesser, either:

(1) The amount representing the payments made under the original contract plus payments made under the new contract; or

(2) The amount representing what the cost would have been if the construction had been completed as contemplated by the plans and specifications under the original contract.

(e) If the surety awards a contract for completion of a defaulted Federal-aid contract or completes it by some other acceptable means, the FHWA will consider the terms of the original contract to be in effect and that the work will be completed in accordance with the approved plans and specifications included therein. No further FHWA approval or concurrence action will therefore be needed in connection with any defaulted Federal-aid contract awarded by a surety. Under this procedure, the construction amount eligible for Federal participation on the project should not exceed the amount representing what the cost would have been if the construction had been completed as contemplated by the plans and specifications under the original contract.

§635.127 Agreement provisions regarding overruns in contract time.

(a) Each State transportation department (STD) shall establish specific liquidated damages rates applicable to projects in that State. The rates may be project-specific or may be in the form of a table or schedule developed for a range of project costs and/or project types. These rates shall, as a minimum, be established to cover the estimated average daily construction engineering (CE) costs associated with the type of work encountered on the project. The amounts shall be assessed by means of deductions, for each calendar day or workday overrun in contract time, from payments otherwise due to the contractor for performance in accordance with the contract terms.

(b) The rates established shall be subject to FHWA approval either on a project-by-project basis, in the case of project-specific rates, or on a periodic basis after initial approval where a rate table or schedule is used. In the latter case, the STD shall periodically review its cost data to ascertain if the rate table/schedule closely approximates, at a minimum, the actual average daily CE costs associated with the type and size of the projects in the State. Where rate schedules or other means are already included in the STD specifications or standard special provisions, verification by the STD that the amounts are adequate shall be submitted to the FHWA for review and approval. After initial approval by the FHWA of the rates, the STD shall review the rates at least every 2 years and provide updated rates, when necessary, for FHWA approval. If updated rates are not warranted, justification of this fact is to be sent to the FHWA for review and acceptance.

(c) The STD may, with FHWA concurrence, include additional amounts as liquidated damages in each contract to cover other anticipated costs of project related delays or inconveniences to the STD or the public. Costs resulting from winter shutdowns, retaining detours for an extended time, additional demurrage, or similar costs as well as road user delay costs may be included.

(d) In addition to the liquidated damages provisions, the STD may also include incentive/disincentive for early completion provisions in the contract. The incentive/disincentive amounts shall be shown separately from the liquidated damages amounts.

(e) Where there has been an overrun in contract time, the following principles shall apply in determining the cost of a project that is eligible for Federal-aid reimbursement:

(1) A proportional share, as used in this section, is the ratio of the final contract construction costs eligible for Federal participation to the final total contract construction costs of the project.

(2) Where CE costs are claimed as a participating item based upon actual expenses incurred or where CE costs are not claimed as a participating item, and where the liquidated damages rates cover only CE expenses, the total CE costs for the project shall be reduced by the assessed liquidated damages amounts prior to figuring any Federal pro rata share payable. If the amount of liquidated damages assessed is more than the actual CE totals for the project, a proportional share of the excess shall be deducted from the federally participating contract construction cost before determining the final Federal share.

(3) Where the STD is being reimbursed for CE costs on the basis of an approved percentage of the participating construction cost, the total contract construction amount that would be eligible for Federal participation shall be reduced by a proportional share of the total liquidated damages amounts assessed on the project.

(4) Where liquidated damages include extra anticipated non-CE costs due to contractor caused delays, the amount assessed shall be used to pay for the actual non-CE expenses incurred by the STD, and, if a Federal participating item(s) is involved, to reduce the Federal share payable for that item(s). If the amount assessed is more than the actual expenses incurred by the STD, a proportional share of the excess shall be deducted from the federally participating contract construction cost of the project before the Federal share is figured.

(f) When provisions for incentive/disincentive for early completion are used in the contract, a proportion of the increased project costs due to any incentive payments to the contractor shall be added to the federally participating contract construction cost before calculating the Federal share. When the disincentive provision is applicable, a proportion of the amount assessed the contractor shall be deducted from the federally participating contract construction cost before the Federal share calculation. Proportions are to be calculated in the same manner as set forth in paragraph (e)(1) of this section.

SECTION C-2

SHELBY COUNTY GOVERNMENT

ENGINEERING DEPARTMENT

TECHNICAL SPECIFICATIONS

SECTION D
TRAFFIC SIGNAL SPECIFICATIONS

SECTION 1. GENERAL

1.01 Work Included:

The complete electrical system for traffic signal intersection control as specified herein or as indicated on the plans, consisting generally of, but not limited to: cabinets, conduit, wire, cable, switches, the traffic signal controller, traffic signal heads, and poles. For definition of terms, see General Requirements and Conditions, Section 1, herein.

1.02 Bids:

- (1) Each bid shall be accompanied by engineering and operational specifications for the equipment bid. Each bidder may be required to furnish one controller of each type bid with cabinet meeting these specifications for 30 days testing and evaluation prior to award of any contract. If a bidder is requested to furnish sample controllers, they shall be furnished to the Department within 15 days of date requested. If the equipment is not submitted as required, the Department may reject that bid. All material, parts and workmanship shall be guaranteed for a period of one (1) year after field installation with defective equipment either repaired or replaced entirely at bidder's expense.
- (2) The successful bidder shall provide, as part of the bid price, a minimum of twenty-four (24) hours of classroom and laboratory instruction on the operation and maintenance of the controllers supplied for three (3) Department technicians. Instructions shall be on a highly technical level, describing the design and operation of electric circuitry in great detail as well as demonstrating trouble shooting and repair techniques. The rudiments of dial systems and basic solid-state theory are below the level of the instruction required by this specification. This instruction shall begin at any time requested by the Department following the contract award and shall be conducted at facilities provided by the bidder. The successful bidder shall provide round-trip transportation from Memphis to the school site and suitable lodging during the school period.
- (3) The Department reserves the right to itemize and award separate contracts for the equipment on this bid.
- (4) The time of delivery after receipt of an order may be considered along with bid price in the evaluation of bids.
- (5) It is the bidder's responsibility to list all exceptions to these specifications on a per item basis. This listing shall not constitute acceptance or rejection of these exceptions by the Department.
- (6) Nothing in these specifications shall be construed as being proprietary or discriminatory. References to brand names are used as a quality reference for bidders. Any quotation will be considered if, in the opinion of the Department, the equipment quoted meets this specification.
- (7) All equipment shall be described completely with the manufacturer's name, model number, catalog number, and any other identifying information provided with the unit price.

- (8) All equipment bid shall be securely packed for shipment so as to avoid damage during transit. All cartons shall be clearly labeled as to their contents, including controller type, and County of Shelby contract number.
- (9) The successful bidder(s) shall arrange for the proper expediting, delivery, and shipment tracing, if necessary, of all equipment awarded to them under this specification. Unless directed by the Shelby County Engineer, delivery shall be F.O.B., including inside delivery, to the City of Memphis, Traffic Signal Maintenance Department, 980 South Third Street, Memphis, Tennessee 38106, (Phone Number 901/528-2844).

1.03 Codes and Standards:

All electrical equipment and materials shall conform to the Standards of the National Electrical Manufacturers' Association (NEMA) or the Radio Manufacturers' Association, whichever is applicable. In addition to the requirements of the Specifications, the Plans, and other Contract Documents, all material and work shall conform to the requirements of the National Electrical Code (NEC); the Standards of the American Society for Testing Materials (ASTM); the American National Standards Institute National Electrical Safety Code (ANSI-C-2) the American Standards Association (ASA); U.S. Department of Transportation, Tennessee Department of Transportation Manual on Uniform Traffic Control Devices (MUTCD); Institute of Transportation Engineers (ITE); International Municipal Signal Association, Inc. (IMSA); and any other local ordinance which may apply.

1.04 Accuracy of Data and Drawings:

Electrical plans and drawings are generally diagrammatic, and where not dimensioned or detailed, indicate approximate locations and general arrangements of electrical work. All electrical work offsets, rises, and fittings are not necessarily shown; however, provide these as required by the conditions involved.

1.05 Submittals:

- (1) As soon as possible, after award of contract, and prior to purchase of materials, submit to the Engineer for approval a complete list of all proposed material; include with the list complete catalog data and descriptive literature of all materials, if requested.
- (2) The supplier shall provide detailed technical circuit description and circuit schematic information applicable to the operation and maintenance of the controller and associated auxiliary equipment. Cabinet wiring diagrams with interconnection details, schematics and maintenance techniques shall be furnished. Information shall be in manual form and shall include a materials guide which shall contain the replacement part numbers and description of all components used. All solid-state devices shall be listed by their generic name or, in lieu of this, a complete cross-index from manufacturer's numbers of generic numbers shall be provided. Parts list shall be itemized with the respective chassis, module or circuit wherein parts may be found. A total listing of parts without grouping shall not be acceptable. Schematic circuit drawings shall be furnished which are slow to fade when exposed to sunlight over long periods of time. A developed and fixed printing process or one of the forms of printing by actual ink transfer will be acceptable. Five (5) copies of all the above information shall be provided for each controller unit. In addition, three (3) copies of a cabinet wiring diagram, including all auxiliary equipment, shall be

supplied with each controller unit. A clear resealable plastic envelope shall be attached with screws to the inside of each cabinet door for storage of the cabinet wiring print. This envelope shall be mounted so as to avoid restriction of the circulation of air into and out of the cabinet.

- (3) Upon completion of the work, and prior to final inspection and acceptance, the Contractor shall submit to the Engineer two (2) copies of "As Built" or corrected plans on mylar or linen showing in detail all construction changes, including location and depth of conduit. The Contractor shall also furnish all literature and drawings which are received with the equipment to be installed and which pertain to the engineering installation, operation, warranty, and maintenance of that equipment.

1.06 Maintenance of Traffic

Traffic disruption and delay shall be kept to a minimum, and traffic operations shall be maintained through the project area for the length of the contract. No more than a curb or parking lane may be closed at any one time. The Engineer or his representative may direct special efforts during certain phases of work to ensure compliance with the approved construction schedule. The waiver of restriction, or the imposition of additional restrictions in critical areas of work and traffic flow, may be granted or established by the Shelby County Engineer.

The Contractor may request permission to work at night in accordance with local ordinances and statutes and as approved by the Engineer. When the Contractor performs any operations after daylight hours, he shall provide and maintain, at his expense, sufficient artificial lighting to permit proper construction and inspection.

The Contractor shall be responsible for providing and maintaining adequate safety lights and barricades to protect the public and must maintain access to abutting property. Such protective work shall be done in conformity with applicable portions of the Manual on Uniform Traffic Control Devices (MUTCD), Tennessee Edition. Steel plates of adequate size and strength shall be installed over trenches in street pavements or driveways left open or incompletely backfilled at the end of a work period. Pedestrians and persons alighting from parked vehicles shall be protected against hazards resulting from construction operations.

1.07 Grounding:

Ground electrical equipment and conductors shall be supplied by the Contractors as required by NEC and other applicable electrical codes.

1.08 Wiring Methods:

- (1) Electrical systems characteristics shall be as indicated on the plans. In addition, whether indicated or not, provide low voltage (less than 120 volts) wiring for controls and other purposes, as required for the complete electrical system.
- (2) Regardless of voltage or use, wiring shall be installed in conduits and metal or other enclosures, unless otherwise indicated or otherwise specified.

1.09 Tests, Service Checks, Inspections, and Documentation:

- (1) The Contractor shall be responsible for the installation tests, demonstration of the functioning system, and checks of all hardware.

(2) Conduit Tests.

After installation of the conduit is completed, all conduit installed shall be tested with a mandrel having a diameter 1/2 inch smaller than the conduit and a length of 2 inches. All conduit which will not allow passage of the mandrel shall be repaired to the satisfaction of the Engineer; if repairs cannot be made, the conduit shall be removed and replaced at no additional cost to the County. After the mandrel test, all conduit shall be scoured with a stiff wire brush slightly larger in diameter than the conduit. The Contractor shall clear all conduit in the presence of the Engineer.

(3) Field Tests

Prior to completion of the work, the Contractor shall cause the following tests to be made on all traffic signal circuits in the presence of the Engineer. Any fault in any material or in any part of the installation revealed by these tests shall be replaced or repaired by the Contractor in a manner approved by the Engineer, and the same tests shall be repeated until no fault appears.

(4) Ground Test.

Each circuit shall be tested for grounds in the circuit.

(5) Megger Test.

A megger test shall be made on each circuit between the circuit and ground. The insulation resistance shall not be less than the values specified in Section 19 of the NEC. The load in amperes of each signal circuit shall be measured at the controller cabinet with a clamp-on ammeter. If the amperage is in excess of the expected lamp load plus minimal transmission losses, the circuit will not be accepted and shall be replaced or corrected by the Contractor at no additional compensation.

(6) Functional Test.

A functional test shall be performed in which it is demonstrated that each and every part of the system functions as specified or intended herein. Signal circuits shall be "flashed out" from the cabinet terminals to determine that the proper function has been assigned each circuit.

(7) Detector Ground Test.

All detector loops and leads shall be tested before and after they are sealed in the pavement to be sure there are no shorts to ground in the system and to assure that the loop plus lead-in inductance is within the operating range of the detector, all according to the Standards on Loop installation.

(8) Inspection

All work and materials to be performed or finished under these specifications shall be subject to observation and inspection by the Engineer according to Section 1112 of this Contract Document Book. Request for an Engineer or Inspector in connection with work under these Specifications shall be made by the Contractor at least twenty-four (24) hours before the services thereof will be required.

(9) Mill Test Reports and Certification.

Mill Test Reports or Certifications of Specifications for Materials and Design will be required for all materials incorporated into the work. The following shall be supplied by the Contractor prior to acceptance of the materials:

- a. "Mill Test Reports" (M.T.R.) for MAJOR structural items only, as noted in Table, shall include both physical and chemical descriptions of the materials as supplied to the fabricator. When physical properties are altered during the fabrication, M.T.R. covering chemical composition will be supplemented by certified test reports indicating the physical properties of this material after fabrication.
- b. Certification of conformance to the Specifications for all remaining material not covered by M.T.R. as noted in Table.
- c. Certification that all welding was performed by operations qualified as follows: Steel welders to AWS and aluminum welders to ASME.
- d. Certification of conformance to the Specification for design of all components not completely dimensioned and detailed in the Design Standards.

TABLE

MILL TEST REPORT AND CERTIFICATION OF CONFORMANCE REQUIREMENTS

Component Materials	M.T.R.	Certification
Tubes for arms and poles	X	
Base castings	X	
Anchor Bolts	X	
Pole tops, miscellaneous fittings and hardware		X
Fabricated or cast-type arm connections		X
Galvanizing		X
Signal cable and wire		X
Loop Sealant		X
Concrete	X	

- (10) Until such time as the Department has made final acceptance, fixture heads shall remain concealed from view of approaching traffic by means of heavy, opaque plastic or canvas cloths, draped over and securely attached to heads.

1.10 Documentation of Traffic Signal Controller/Cabinet:

The Contractor shall furnish to the Engineer one set of the documentation described in page of these Specifications for each traffic signal controller/cabinet installed.

1.11 Guarantee:

The traffic signal system(s) installed under these specifications, including all equipment, parts and appurtenances in connection therewith, shall be guaranteed to Shelby County by the Contractor against defective workmanship and materials for a period of not less than one year following the

date of acceptance thereof. Upon completion of the project, warranties or guarantees on equipment and materials that are offered by the manufacturers as normal trade practice and have not expired shall be turned over by the Contractor to the Engineer.

1.12 Removal and Salvable Equipment:

Utility companies will be responsible for the relocation and/or removal of their poles and equipment. The poles, equipment, and other items to be removed by the Contractor have been generally noted on the Plans; however, it is the intent of these Specifications to have the Contractor remove any traffic control-related items that are in conflict with the installation of the proposed signal and stockpile it on the project site as directed by the Engineer to be picked up by the local municipalities. This includes but is not limited to signal poles, controllers and cabinets, pullboxes, signal heads, and signs. All items so designated or directed to be removed, upon placing in operation new or temporary signals, shall be removed and stockpiled in such a manner that the removed equipment will not be damaged. Poles shall be removed complete and undamaged. The pole shall be cleaned of any concrete foundation material. Any damage due to negligence on the part of the Contractor because of lack of proper care and equipment shall be cause for Shelby County to order its replacement. The cost of such replacement shall be borne fully by the Contractor without extra compensation. All such removed and salvable equipment is now and shall remain the property of the municipality from which it was removed.

SECTION 2. EXCAVATION AND BACKFILL

2.01 Excavation:

The Contractor shall excavate and backfill, as required, for the electrical work. He shall cut bottoms of trenches to the proper lines and grades to provide firm and continuous support for the underground electrical work, and to provide 24" MINIMUM depth from finished grade to tops of all exterior underground electrical work. Sheet and brace excavations, as required, to protect personnel and adjacent structures.

2.02 Backfill:

After the underground electrical work has been installed and approved, the Contractor shall place backfill in 8" maximum thickness loose layers, and compact each layer to at least the density of the adjacent undisturbed site soil using pneumatic or other suitable power tampers. Mass backfilling (backfilling without tamping) is prohibited.

SECTION 3 CONDUITS AND FITTINGS

3.01 General:

Metallic or plastic conduit may be used for all installations except non-metallic conduit shall be used for ground wire raceways in pole foundations and. Conduit size shall be taken as the inside diameter.

3.02 Materials:

- (1) Metal conduit and fittings shall be rigid heavy-walled, hot-dipped galvanized steel and shall comply with the latest edition of Underwriters Laboratories' Standard UL 6, Federal Specification WW-C-581 and American National Standards Institute C 80.

- (2) Plastic conduit (PVC) shall be heavy-walled, extruded moisture and oilproof polyvinylchloride, corrosion resistant, with watertight joints and high impact strength. Conduit and fittings shall be in accordance with NEMA TC-2 and WC-1094 Specifications, UL listed.

3.03 Installation - General:

- (1) Jacking and boring shall be accomplished by approved jacking and drilling methods that will not disturb the pavement. Jacking and drilling pits shall be kept at least two (2) feet clear of the edge of any type pavement whenever possible. Use of water that may cause undermining of the pavement will not be permitted. Excavation and backfilling incidental to the operation will not be paid for separately.
- (2) The Contractor shall remove all excess dirt, asphalt, concrete, etc., following installation and acceptance of conduit. Sod shall be placed after inspection to match surroundings.
- (3) Metallic conduit shall be properly threaded and reamed with wire entrances protected by bushings and shall be grounded. Where more than one metallic conduit enters a pull box, cabinet, or foundation, bonding shall be accomplished by the use of straps and jumpers. Bends and offsets shall be avoided where possible, but where necessary, shall be made with a proper hickey, pipe bender, or conduit bending machine. Article 346 of the National Electrical Code shall govern metallic conduit installation.
- (4) Equipment and methods recommended by the manufacturer shall be used in field bending of non-metallic conduit. This shall include the use of plugs where recommended. Conduit which has been crushed or deformed due to improper bending or handling shall not be installed. Article 347 of the National Electrical Code shall govern non-metallic conduit installation.
- (5) Threads on metal conduits shall be clean cut, straight, and true, and of sufficient length to permit proper coupling; long running threads will not be permitted on any part of the work. Threads shall be protected in transit and during installation, and conduit shall be provided with proper supports and protection during construction to prevent damage to the threads. All ends of pipe installed for future connections shall be properly threaded, reamed, and capped to prevent water and foreign matter from entering the conduit system. Sections shall be made up with pipe dope so that ends of conduit will abut. Threaded ends in pull boxes and foundations shall be provided with approved conduit bushings. All joints shall be sealed with pipe dope for a waterproof installation.
- (6) All bends into pull boxes and foundations shall be free from kinks and of such easy curvature to permit the drawing in of cables without damage to insulation. Conduit between pull boxes, foundations, and poles shall be placed in a straight line, unless otherwise shown in the Plans.
- (7) After installation of the conduit is completed, all conduit installed shall be tested with a mandrel having a diameter 1/2 inch smaller than the conduit and a length of 2 inches. All conduit which will not allow passage of the mandrel shall be repaired to the satisfaction of the Engineer; if repairs cannot be made, the conduit shall be removed and replaced at no additional cost to the County. After the mandrel test, all conduit shall be scoured with a stiff wire brush slightly larger in diameter than the conduit. The Contractor shall clear all conduit in the presence of the Engineer.

- (8) All conductors, except sawed loop detector conductors and span wire runs (as shown on the Plans), shall be run in conduit, except where the run is inside poles. Where signal conductors are run in standards containing high voltage (over 600 volts) street lighting conductors, the lighting conductors shall be disconnected and encased in flexible metal or rigid metal conduit.
- (9) Conduit shall be laid to a depth of not less than 36 inches below pavement grade, unless otherwise approved by the Engineer, except conduit may be laid at a depth of not less than 24 inches below top of curb when placed behind the curb. Conduit runs shall be located as shown on the Plans or as directed otherwise by the Engineer.
- (10) Conduit sizes will be indicated on the Plans. Signal conduit shall be a minimum of 2 inches in diameter and detector conduit a minimum of 1 inch in diameter, unless otherwise indicated. Conduit for service connections shall be 2 inches in diameters. Conduits smaller than 1 inch diameter shall not be used unless otherwise specified, except grounding conductors at service points shall be enclosed in 3/4 inch diameter PVC conduit. The Contractor may, at his own expense, use larger size conduit than specified, in which case it shall be for the entire length of the run with no reducing couplings permitted.
- (11) Conduit terminating in anchor base standards and pedestals shall extend approximately 6 inches above the foundation and shall be sloped toward the handhole opening. Conduit shall enter concrete pull boxes from the bottom and shall terminate not less than 2 inches nor more than 4 inches above the bottom of the box and near the box walls to leave the major portion of the box clear. All such metal conduit terminations shall be fitted with a grounding bushing to protect the cable jackets and to bond the conduits into the ground system in accordance with the Plans.
- (12) Existing underground conduit to be incorporated into a new system shall be checked with a mandrel and scoured the same as new conduit, all in the presence of the Engineer.
- (13) An approved rope or snaking device shall be placed in all conduit (new and reused) following mandrel and scouring for use in pulling in pull ropes for installing the wiring cable of conductors. A 2-inch mandrel 1/2 inch smaller in diameter than the conduit shall be passed through the entire length of the conduit immediately before installation of cable.

3.04 Installation of Jacked Underground Conduit:

Conduit under existing pavement shall be placed by an approved jacking or drilling method. Existing pavement shall not be disturbed unless otherwise directed by the Plans or by the Engineer.

3.05 Installation of Conduit Risers:

Conduit risers shall be fitted with condulets and a weatherhead, and attached to the poles as shown on the Plans or Design Standards.

3.06 Installation of Conduits under Streets and Driveways:

All conduits installed under streets and existing driveways shall be placed in accordance with the Plans or as approved by the Engineer. No more than one-half of street width may be closed to traffic at any one time. Temporary bridging of narrow trenches with suitable steel plates will be permitted if requested in the Contractor's schedule of operation plans. Existing pavement surfaces shall be removed to neat lines. Pavement patches shall conform to the details shown in

the Plans for areas where future improvements, like material and methods, will be used for replacement unless, otherwise directed by the Engineer. Finished grade shall conform to the surrounding pavement and shall present a smooth riding surface when completed.

The Contractor shall maintain the patched trench by adding or removing asphaltic concrete paving materials as directed by the Engineer until a stable, smooth crossing is obtained.

SECTION 4. WIRE, JOINTS, AND SPLICES 600 VOLTS AND LESS

4.01 Type of Wire:

Lighting and power wires shall be copper only. Types shall be:

- (1) Where type is indicated: Indicated type only.
- (2) High temperature and other special conditions: Types NEC approved for the conditions involved.
- (3) Exposed flexible cords: Type SO, with grounding conductor.
- (4) Direct earth burial: Type USE, with neoprene jacket.
- (5) All other lighting and power wire: Type THW.
- (6) Ground conductors: Copper only.

4.02 Control Wire:

Control wire shall be type MTW copper, stranded.

4.03 Copper Wire:

Where sizes of copper wire are neither indicated nor otherwise specified, copper wire sized shall be:

- (1) Branch circuit wire: No. 12.
- (2) Control Wire: No. 14, or as recommended by the control manufacturer.
- (3) Special system wire: As recommended by the manufacturer or the equipment involved.

4.04 Identification:

- (1) General: All wires shall be identified, as required by NEC.
- (2) Control and special systems wire: These shall be color coded throughout, or identified at each terminal and junction point with a suitable permanently attached tag or label.

4.05 Joints and Splices:

All joints and splices shall be made with suitable solderless connectors, in the various boxes,

gutter, and similar locations, but not in any conduit. Enough wire shall be left slack to permit at least one splice or joint to be remade in case of fault.

- (1) Branch circuit, control, and special system copper wire joints: Use Ideal, Buchanan, 3M, or similar tool-applied or twist-on type connectors.
- (2) All other copper wire joints: Use IlSCO tin-plated aluminum type pressure connectors, or suitable brass, bronze or copper pressure connectors.
- (3) All joints and splices shall be insulated with suitable sleeves or caps integrated with the connectors or separate therefrom, or with vinyl plastic insulation tape.

SECTION 5. SERVICE

5.01 General:

Contractor shall arrange with local utility to provide electrical service to new controller locations. Contractor shall terminate feeders at pole leaving 6'-0" free ends for connection to electric service by utility.

SECTION 6. TRAFFIC SIGNAL CONTROLLER

6.01 General. This section describes the general and specific construction and operating requirements of new local intersection traffic signal controllers, cabinets, and related equipment to be furnished by the Contractor.

This section contains design requirements for controllers, controller interface, physical standards, functional standards, and coordination standards.

The control equipment described herein is to be used in operating traffic signals as part of a coordinated system. The local control equipment shall be fully compatible with the signal system and central software supplied as called for in other sections.

All definitions contained in *NEMA Standards Publication No. TS1-1989* (hereinafter referred to as the NEMA) shall apply.

The Contractor shall install all local controller databases, including coordination timing and scheduling, using data furnished by the Engineer in standard, traffic engineering terminology.

6.02 New Local Intersection Controllers.

- (1) General. All new local intersection traffic signal controllers shall be a fully-actuated, two-through-eight phase, four-ring solid-state, digitally-timed traffic signal controller. Each model of new controller furnished by the Contractor shall be a proven controller and not a pre-production prototype.

The controller shall be of modular design with an internal power supply all mounted in a suitable sheet metal enclosure. The metal chassis shall be designed for easy access to the printed circuit

boards. All pin connectors shall be front mounted.

- (2) Required Phase Sequences. Each new controller furnished by the Contractor shall be fully capable of providing, as a minimum, all standard NEMA phase sequences, all phase sequences shown on the plans. The local controllers, in combination with the central software, shall provide for coordination of each of these required phase sequences and for the independent programming of each odd- numbered phase (i.e., 1, 3, 5 and 7) to be either leading or lagging with respect to its corresponding even-numbered phase (i.e., 2, 4, 6 and 8).
- (3) Specific Design Requirements.
 - (i) Modules. The design shall allow for easy removal or replacement of all modules without the use of special tools.
 - (ii) Circuitry. The controller circuitry shall consist of a high threshold solid-state digital electronic design. The circuit components shall be standard production types that are typically available from industrial electronic supply houses. The circuit and component design life under continuous duty operation shall not be less than ten years. All controllers shall employ high quality solid-state, modular electronic construction designed for continuous unattended operation. No electro-mechanical devices such as camshafts, rotary stepping line switches, lightning discharge tubes, or vacuum or gaseous tubes shall be used for internal or external auxiliary circuitry.
 - (iii) Equipment Housing. The controller shall be a completely enclosed in a metal or high-impact plastic case which is easily removed and replaced. If not metal, the inside of the case shall be sprayed with a conductive film. The design shall include screened or recessed vent holes. The model and serial number shall be securely affixed to the outside of the housing.
 - (iv) Fuses. All equipment shall be individually fused with protection devices that are panel-mounted on the front face of the equipment. Fuses shall be provided for both the 120 VAC and 24 VDC power.
 - (v) Controller Expansion/Modification Capability. Controller shall be provided to operate as a two (2) through eight (8) phase controller. The controller design shall permit the mode of operation to be changed and the vehicle and pedestrian phasing capacity to be increased without requiring that the controller case be internally modified or rewired. The motherboard and power supply shall be of adequate design to service the maximum configuration of the controller.
- (4) Required Features.
 - (i) Per-Phase Features. The following per-phase features shall be provided:
 - Extended flashing ped clearance
 - Actuated rest in walk
 - Soft vehicle recall
 - Selective phase omit
 - Selective phase yellow omit
 - Conditional service
 - Detector (stretch, delay and switching)

(ii) Per-Unit Features. The following per-unit features shall be provided:

- Programmed (remote) flash
- Exclusive ped service
- Ring configurations (to 4 rings)
- Start-up flash or all red
- Remote sequence modifiers (16)
- Timed trailing overlaps
- Overlap green/yellow omit
- Auto timing of ped clear
- Resident diagnostics
- Parameter printout
- Unit-to-unit transfer

(iii) Coordination. As a minimum, the following coordination features shall be provided:

- 4 Dial/4 Split/3 Offset
- 48 traffic patterns
- 3 offset correction modes
- Transition cycles
- Auto permissives (vehicle and pedestrian)
- Sync monitoring
- Manual control
- Input monitor (walk rest modifier, manual control enable, stop time, remote flash)
- Dial/split to dial/split copy

(iv) Time Base. As a minimum, the following time base scheduler features shall be provided:

- Primary plus two alternate weeks
- 90 alternate days
- 180 event capacity
- Dimming (per phase by phase output)
- Auxiliary outputs, minimum of four (4)
- Max II selection per phase TOD
- Phase omit TOD
- Automatic or user-programmable daylight savings time and leap-year adjustment

(v) Preemption. A minimum of six (6) preempt sequences, each with the following features, shall be provided:

- Delay and duration (multiple runs)
- Programmable sequence
- Programmable flash override
- Programmable priority

The Contractor shall program and make operational all preemption sequences called for in the plans.

(vi) Special Detector Capabilities. The controller shall have the ability to assign, modify, and view detector operational parameters of all detector inputs to the controller. Detector operations shall be assigned as follows:

- A standard vehicle detector
- A standard pedestrian detector
- A 1-calling vehicle detector where the input shall operate as a vehicle detector that is operational while the phase is not green and the phase is on locking detection.
- A stop bar detector that shall operate as a vehicle detector which operates normally until it is in its phase green. In the green, the detector is disconnected and does not input to the phase. This feature is to operate in either lock or non-lock operation.
- A stop bar detector whose input shall operate as a vehicle detector that operates normally when the assigned phase is not green. When a call is detected, it shall be held in green until a gap greater than the Extend Timer setting occurs. The Extend Timer shall begin with the green. If a call is received before the Extend Timer times out, it shall be reset. Timer reset shall continue to occur until a gap is large enough to allow the Extend Timer to time out. Once a time out occurs, the detector shall be disconnected until the green terminates. When the extend time setting is zero, a call shall be held in green until a gap occurs. Delay time is to function normally.
- Ability to switch detector actuations to another phase when the assigned phase cannot be serviced normally or is red or yellow and the entered phase is green.
- Delayed actuations, selectable from 0-99.9 sec. in 1/10th sec. increments.
- Extended actuations, selectable from 0-99.9 sec. in 1/10th sec. increments.

(vii) Special Features. As a minimum, the following special features shall be provided:

- Eight (8) system detector/coordination inputs
- Detector diagnosis
- Detector assignments and special detector allocation
- Speed report
- Measurements of effectiveness
 - ☐ Green utilization
 - ☐ Time waiting
 - ☐ Cars waiting
 - ☐ Volume
- Controller local alarm log
 - ☐ The log shall be accessible from the keyboard
 - ☐ It shall have the ability to store up to 80 alarms, of the following types, and showing the date and time of occurrences:
 - On-line/off-line
 - Power on/off-interrupt
 - Preemptions and user definable alarms
 - Low battery check/replace
 - Watchdog timeout
 - EPROM write/failure counts

- RTC chip failure/fault/adjust
- Alarm/Comm/TrafResp./Speed/ MOEs/Detector log faults
- Diagnostics
- Coord status and Local/Free
- Software clock adjust
- Time change remote/keypad

- ☐ Alarms shall appear in the order in which they occur. It shall be able to store up to 80 of the latest alarms with any additional alarms replacing the oldest.

- Remote selected special functions
- Remote "Manual" overrides
- TBC on loss of communications
- Upload and download data
- Communications

(5) Miscellaneous Requirements.

- (i) All input data shall be user-programmable by means of the keyboard and LCD display. All internal time setting shall be programmed via a 16 position keypad and stored in a removable EEPROM memory program pack. Programming shall be facilitated by the use of menu driven displays in English terms. Data entry and interrogation of the controller shall be made easy by listing instructions in English on the display so that codes or reference manuals are not required.
- (ii) All controllers shall be provided capable of coordinated control. Any phase of a multi-phase controller shall be capable of being the coordinated phase with any or all 16 timing plans.
- (iii) The controller shall have one and only one set of master digital clocks to time all intervals of all phases. Separate clocks associated with and/or located on individual phase boards are prohibited.
- (iv) The control unit enclosure shall bear a name plate plaque with an ingrained identifying serial number, model number, and manufacturing date code.
- (v) All printed circuit boards shall be of fiberglass - epoxy construction with a minimum of two (2) ounce copper circuit track and comply with NEMA.
- (vi) All controller unit input and output integrated circuit components shall be socket mounted to facilitate repair and maintenance of input/output boards. Also, all CPU board integrated circuit components with 14 or more leads shall be socket mounted.
- (vii) The control unit shall be furnished consistent with a standard model designation and registration and it shall be completely interchangeable with other units of the same model and type, as well as with other controllers which comply with NEMA Section 13.
- (viii) The controller shall be furnished with dual maximum on all phases. The second maximum limit shall be timed by internal controller circuitry. No external timers shall be permitted. The selection of maximum limit 1 or 2 shall be by either remote selection, internal time base, or time clock(s), and with selection of the maximum limit 1 or 2 for a particular phase being independent of the selection of maximum limit 1 or 2 for any other phases.
- (ix) The control unit shall be furnished with a liquid crystal (minimum 8 line by 40 characters per line) alpha-numeric display for parameter entry and viewing. The display shall present current real-time status of active timers and/or states per ring for two rings simultaneously. All status indicators shall be presented in abbreviated English NEMA recognizable terms.
- (x) Digital timing utilizing the 60 Hertz frequency of the electrical service line as a counting

reference shall be used for all intervals. Any interval shall not deviate more than 0.100 seconds from its true time setting.

- (xi) The control unit shall have a self-contained power supply to operate the controller and all auxiliary equipment. The power supply shall operate from an electric service line with input voltage from 95 to 135 volts, 60 Hertz, and develop stabilized controller voltages for continuous controller operation with interval timing remaining within specified tolerances. The power supply shall be separately and independently fuse protected for both the 120 VAC input and 24 VDC output with easily accessible fuses. Internal fuses are not permitted. DC output for external circuitry shall be rated at a minimum of 0.5 amp and capable of direct short circuit without internal damage to the power supply. All components of the power supply shall be amply derated with respect to heat dissipating capacity so that any extreme ambient temperature and applied voltage shall result in neither a material shortening of component life or a severe deterioration of operational characteristics. The power supply shall be capable of operating the controller when expanded to its maximum capabilities complete with all auxiliary equipment. No auxiliary or external power supplies permitted.
 - (xii) All controller input and output logic levels shall be a nominal zero volts (logic ground) for the true state and nominal +24 volts for the false state.
 - (xiii) The controller shall conform to requirements of "Environmental Standards for Test Procedures." No cabinet surge protection or line filters shall be considered in providing the required transient protection.
- (6) Parts Lists and Cross-Referencing. The Contractor shall provide a detailed technical circuit description and circuit schematic information applicable to the operation and maintenance of each type of controller and associated auxiliary equipment. Cabinet wiring diagrams with interconnection details, schematics and maintenance techniques shall be furnished. Information in manual form shall include a materials guide, which shall contain the replacement part number and description of all components used.
- All solid-state devices shall be listed by their generic name or in lieu of this, a complete cross index from manufacturers numbers to generic number shall be provided. Parts lists shall be itemized with the respective chassis, module or circuit wherein parts may be found. A total listing of parts without grouping shall be unacceptable. Schematic circuit drawings of a type which is slow to fade when exposed to sunlight over long periods of time shall be furnished. A developed and fixed printing process or one of the forms of printing by actual ink transfer will be acceptable. Three (3) copies of all the above information shall be provided for each ten (10) or partial group of ten (10) like controller units furnished. In addition, a photo mylar master of a cabinet wiring diagram including all auxiliary equipment shall be supplied with each control cabinet type.
- (7) Software and Software Updates. The Contractor shall furnish a certification from the controller manufacturer that the controller software will be updated as revisions are available. One (1) copy of the latest computer system software for an IBM-compatible microcomputer shall be furnished by the Contractor. The certification will assure that this copy will be updated by the controller manufacturer so that both the traffic controllers and the computer are operating on compatible software. The certification shall state that this software update service will be provided at no future cost to the Department or the City.

6.03 Internal Communications Transceiver.

- (1) General. Each new local controller furnished by the Contractor shall have an internal communications transceiver which shall receive system commands and data from the central system and transmit local intersection status data, database, and system detector data to the central system.
- (2) Functions Monitored. As a minimum, the following functions shall be monitored and the status of each transmitted to the central system:
 - (i) All vehicular signal indications for each active phase and green, yellow, and red indications for a minimum of four (4) overlaps.
 - (ii) All pedestrian indications for a minimum of four (4) active phases. WALK, flashing DONT WALK, and steady DONT WALK shall be monitored.
 - (iii) Vehicle and pedestrian actuations for each active phase.
 - (iv) Timing plan in effect.
 - (v) Cycle countdown.
 - (vi) Status of all local special functions, including the "door-open" alarm required per Subsection 5.1.2 of the specifications.
 - (vii) Operational status of the intersection (in coordination, in transition, free operation, flash, local manual control or preempted).
- (3) Data Transferred. The communications transceiver shall receive from the central system command data including, minimally, the following:
 - (i) Timing plan commands.
 - (ii) Local special function commands (minimum of four).
 - (iii) Coordinated or free mode.
 - (iv) Request for local data response.
 - (v) System clock update
- (4) Database Downloading/Uploading. The communications transceiver shall permit downloading and uploading of the entire local intersection database, including coordination and TBC, to/from disk storage at the central facility.
- (5) Design Standards. The communications transceiver's connector shall not be interchangeable with any other connector in the local controller cabinet. As a minimum, the communications transceiver shall provide the following features:
 - (i) Time division multiplexing/frequency shift keying techniques.
 - (ii) Two-way communications over agency-owned cable.
 - (iii) Parity and error checking diagnostics to assure transmission/reception of valid data.

- (iv) Appropriate indicators including, but not limited to, transmitting and carrier reception.
- (v) Local address assignment.
- (vi) Transmitter output level which is either user adjustable to a maximum of zero (0) dB or automatically maintained within the range of 0 to 3 dB continuous.
- (vii) Transmitter frequency stability of ± 5 Hz over the NEMA operating temperature range.
- (viii) Receiver in-band signal-to-noise ratio of +10 dB or greater.
- (ix) Receiver input common mode rejection of greater than 40 dB.

6.04 Internal Fiber Optic Transceiver. Each new controller shall have an internal fiber optic transceiver which fully complies with requirements set forth in Subsection 6.03. Each such fiber optic transceiver shall either be an OTR/RP or an OTR/LT as required for the application called for on the plans.

6.05 New Traffic Signal Controller Cabinets.

(1) Cabinet Material.

- (i) Pole-mounted cabinets and pedestal-mounted cabinets shall be fabricated from cast aluminum or welded sheet aluminum or a combination of both. All welds shall occur on the inside surface of the cabinet to maintain a clean appearance.
- (ii) Base-mounted controller cabinets shall be fabricated from welded sheet aluminum. All welds shall occur on the inside surfaces of the cabinet to maintain a clean appearance.
- (iii) All new controller cabinets shall have an unpainted natural aluminum finish.

- (2) Doors. Cabinets shall have a right hinged front opening door, which shall include, substantially, the full area of the cabinet front and one (1) auxiliary police door-in-door for access to emergency controls. The main door shall be equipped with a positive hold fast device to secure the door in at least two open positions being approximately 90 degrees open and the other at 120 degrees or more. The hold fast device shall be easily secured and released without the use of tools. Each door shall be furnished with a neoprene rubber door sealing gasket to assure the weatherproof integrity of the cabinet doors when closed. The main cabinet door shall employ two or three heavy duty hinges which shall be welded to or an integrally cast part of the cabinet and door. Hinge pins shall be 6 mm diam. stainless steel. No "piano" hinges or riveted construction shall be acceptable. The police panel door shall employ hinges meeting the above requirements.

The main cabinet door shall have a switch wired to activate "door-open" alarm input into the controller. This alarm shall be active whenever the main door is open.

- (3) Locks and Keys. The main door shall have a Corbin pin-tumbler cylinder lock, conforming to the City of Memphis master key; the Memphis key code shall be furnished to the Contractor after award of contract. The auxiliary police door shall be furnished with a standard police sub-treasury lock. One (1) key for each lock shall be provided with each controller cabinet.

(4) Mounting Hardware.

- (i) Base-mounted cabinets shall be installed on a concrete foundation using Contractor-

furnished hot dip galvanized bolts, nuts, and washers.

- (ii) Pole-mounted cabinets shall be equipped with brackets (two each) for 19 mm wide stainless steel banding. The Contractor shall attach such cabinets to wood or steel poles using food service grade stainless steel banding which has minimum thickness of 4.5 mm.
 - (iii) Pedestal-mounted cabinets shall be furnished with a galvanized slip-fitter sized appropriately for the existing pedestal post. The bottom of pedestal-mounted cabinets shall be reinforced as necessary to prevent wobble and/or excessive flexing when the cabinet is attached to the pedestal post.
- (5) Fans and Ventilation. All cabinets shall be furnished with a thermostatically operated roof-mounted electric exhaust fan. All cabinets shall have fans rates at 5.66 cubic meters per minute at 38 degrees Celsius. The fan shall be equipped with long lasting permanently lubricated bearings for constant unattended operation. The exhaust fan shall be mounted in a rain-tight housing attached to the cabinet top. The thermostat shall be adjustable from 20 degrees Celsius to 70 degrees Celsius.

In all cabinets, the inlet ventilation openings shall be located in the lower part of the cabinet door, shall be screened and fitted with a fiberglass, furnace-type replaceable air filter of adequate size and capacity to pass a volume of air equal to or greater than the rated capacity of the fan. The air filter supplied shall be a type and size which is readily available commercially.

(6) Surge Protection.

- (i) Electromechanical Relays. Each 120 VAC electromechanical relay in the cabinet, flash transfer, signal monitor, etc., shall be suppressed with an R. C. circuit (100 OHM/0.1 MAD) across it to ground.
- (ii) AC Service. The cabinet AC service shall be provided with the following surge protection:
 - Unit shall be a series hybrid type rated at 20,000 amps (8 x 20 microsecond) 20 times.
 - The protector shall be provided with terminals as defined below:
 - ☐ Main line (AC line first stage terminal)
 - ☐ Main neutral (AC neutral input terminal)
 - ☐ Equip line in (AC line second stage input terminal, 10 amps)
 - ☐ Equip line in (AC line second stage output terminal, 10 amps)
 - ☐ Equip neutral out (neutral terminal to protected equipment)
 - ☐ GND (earth connection)
 - The equip line in and equip line out terminals shall be separated by a 200 microhenry (minimum) inductor rated to handle 10 amps AC service.
 - The first stage clamp shall be between main line and GND terminals.
 - The second stage clamp shall be between equip line out and equip neutral.
 - Main neutral and equip neutral out shall be connected together internally

and shall have a gas discharge tube rated at 20 kA between main neutral and GND terminals.

- Main line and equip line terminals shall be isolated internally.
- If gas discharge tubes are utilized for the first stage clamps, each tube shall have a minimum of 0.15 OHM follow-current limiters in series.
- Peak clamp voltage: 350 volts at 20 KA. (Voltage shall be measured between equip line out and equip neutral out terminals. Current shall be applied between main line and GND terminals with GND and main neutral terminals externally tied together.)
- Response time: voltage as measured during peak clamp voltage test can never exceed 350 volts.
- Protector shall be epoxy encapsulated in a flame-retardant material.
- Continuous service current -- 10 amps at 120 VAC RMS.

(iii) Solid-State Load Switches.

- Each AC+ signal display terminal shall withstand a 10 kA, (8 x 20 microsecond surge) 5 times without damage.
- Unit response time shall be less than 50 nanoseconds.
- Maximum clamping voltage shall be 395 volts (at 1 mA).
- Unit shall return to a high impedance state following surge.
- Unit shall be epoxy encapsulated in flame retardant material.

(iv) NEMA 24 VDC Inputs. Each 24 VDC input that leaves main controller cabinet, (such as ped detector, remote vehicle detector, logic common, etc.) shall be protected at the cabinet entry point with the following surge protection:

- Unit must be a two stage hybrid type.
- The signal pair must "pass thru" the protector so that the protector has an input lead, and output lead, and a ground connection.
- Peak surge: 4000 amps, 8 x 20 microsecond waveform.
- Number of occurrences: 25 times minimum at 2000 amps. 8 x 20 us. protector shall be operative after this test.
- Unit first stage shall be a two element gas discharge tube rated at 5 kA (8 x 20 US).
- Unit second stage shall be 1500 watt silicon avalanche device with a clamp voltage of 45 volts max. at 2000 amps.

- Unit shall be epoxy encapsulated.
- (v) Vehicle Detectors. Each vehicle detector input circuit (at cabinet entry point) shall be equipped with the following surge protection:
- Unit shall be a three terminal device capable of protecting the detector against differential (between the loop leads) surges, and against common mode surges (between leads and ground).
 - Unit shall withstand six 400 amp (8 x 20 US) differential mode surges and six 1000 amp (8 x 20 US) common mode surges.
 - Unit shall clamp both common mode and differential mode surges at 35 volts maximum in less than 40 nanoseconds.
 - Differential (between loop leads) capacitance of the protector shall be less than 50 microfarads.
 - Unit shall be epoxy encapsulated.
- (7) Radio Interference Suppressor. The cabinet shall be equipped with a radio interference filter installed at the electric service line input. The filter shall provide a minimum electrical noise attenuation of 50 decibels over the range of 200 kilohertz to 75 megahertz.
- (8) Preemption Isolation Relays. At intersections where the plans call for preemption, an isolation relay shall be provided for each separate preempt input.
- Railroad preemption, where called for on the plans, shall provide fail-safe operation such that removal of voltage from the railroad cabinet-side of the isolation relay shall remove an input to the controller and thereby initiate the railroad preemption sequence.
- (9) Pin Connectors. Electronical connections between the control unit and the cabinet wiring harness(es) shall be accomplished using one or more "MS" type multiple pin connectors at the controller (NEMA type) and insulated spade wire terminal connectors at the cabinet terminal blocks. The pin connectors and function pin assignments shall be in accordance with Tables 1, 2, and 3. All functions developed within the control unit for existing or future expanded phasing, up to the maximum capability of the controller, shall be available at the cabinet terminals for greatest operational flexibility. All functions and pin assignments required by NEMA shall be provided as a minimum. Additional functions and features either required by these specifications or offered by the manufacturer, shall be provided through the pin connector on otherwise spare positions.

Additionally, end controller unit shall be provided with one RS 232 connector with pin assignments as follows:

<u>PIN</u>	<u>FUNCTION</u>
1	Frame Ground (FG)
2	Transmit Data (TD)
3	Receive Data (RD)
4	Request To Send (RTS)
5	Clear To Send (CTS)

6	Not Used
7	Signal Ground (SG)
8	Data Car Det. (DCD)
20	Data Term Rdy (DTR)

TABLE 1

CONNECTOR A
Alphabetical Listing of Pin Assignments

Pin	Function	Pin	Function
A	Spare 1	AA	Test Input B
B	+24V DC External	BB	Walk Rest Modifier
C	Voltage Monitor Output	CC	Coded Status Bit A Ring
D	Phase 1 Red Driver	DD	Phase I On
E	Phase 1 Don't Walk Driver	EE	Phase 1 Ped Omit
F	Phase 2 Red Driver	FF	Ped Recycle Ring 1
G	Phase 2 Don't Walk	GG	Max 2 Selection-Ring 1
H	Phase 2 Ped Clear	HH	Spare 5
J	Phase 2 Walk		
K	Phase 2 Vehicle Call Det		
L	Phase 2 Ped Call Det		
M	Phase 2 Hold		
N	Stop Timing Ring 1		
P	Inhibit Max Term Ring		
R	External Start		
S	Interval Advance		
T	Spare 2		
U	AC-		
V	Chassis Ground		
W	Logic Ground		
X	Flashing Logic Output		
Y	Coded Status Bit C Ring 1		
a	Phase 1 Yellow		
b	Phase 1 Ped Clear		
c	Phase 2 Green		
d	Phase 2 Check		
e	Phase 2 On		
f	Phase 1 Vehicle Call Det		
g	Phase 1 Ped Call Det		
h	Phase 1 Hold		
i	Force Off Ring 1		
j	Ext Min Recall All Phases		
k	Manual Control Enable		
m	Call to Nonactuated I		
n	Test Input A		
p	AC+		
q	Spare 3		
r	Coded Status Bit B Ring 1		
s	Phase 1 Green		
t	Phase 1 Walk		
u	Phase 1 Check		

v	Phase 2 Ped Omit
w	Omit All Red Clear Ring 1
x	Red Rest Mode Ring 1
y	Spare 4
z	Call to Nonactuated II

TABLE 2
CONNECTOR B
Alphabetical Listing of Pin Assignments

Pin	Function	Pin	Function
A	Phase 1 Next	AA	Overlap A Green Driver
B	Spare 1	BB	Overlap B Yellow Driver
C	Phase 2 Next	CC	Overlap B Red Driver
D	Phase 3 Green Driver	DD	Overlap C Red Driver
E	Phase 3 Yellow Driver	EE	Overlap D Yellow Driver
F	Phase 3 Red Driver	FF	Overlap C Green Driver
G	Phase 4 Red Driver	GG	Overlap B Green Driver
H	Phase 4 Ped Clear Driver	HH	Overlap C Yellow Driver
J	Phase 4 Don't Walk Driver		
K	Phase 4 Check		
L	Phase 4 Veh Call Det		
M	Phase 4 Ped Call Det		
N	Phase 3 Veh Call Det		
P	Phase 3 Ped Call Det		
R	Phase 3 Omit		
S	Phase 2 Omit		
T	Phase 5 Ped Omit		
U	Phase 1 Omit		
V	Ped Recycle Ring 2		
W	Spare 2		
X	Spare 3		
Y	Phase 3 Walk Driver		
Z	Phase 3 Ped Clear Driver		
a	Phase 3 Don't Walk Driver		
b	Phase 4 Green Driver		
c	Phase 4 Yellow Driver		
d	Phase 4 Walk Driver		
e	Phase 4 On		
f	Phase 4 Next		
g	Phase 4 Omit		
h	Phase 4 Hold		
i	Phase 3 Hold		
j	Phase 3 Ped Omit		
k	Phase 6 Ped Omit		
m	Phase 7 Ped Omit		
n	Phase 8 Ped Omit		
p	Overlap A Yellow Driver		
q	Overlap A Red Driver		
r	Phase 3 Check		
s	Phase 3 On		
t	Phase 3 Next		
u	Overlap D Red Driver		

v Spare 4
w Overlap D Green Driver
x Phase 4 Ped Omit
y Spare 5
z Max 2 Selection-Ring 2

TABLE 3
CONNECTOR C
Alphabetical Listing of Pin Assignments

Pin	Function	Pin	Function
A	Coded Status Bit A Ring 2	AA	Phase 6 Ped Clear Driver
B	Coded Status Bit B Ring 2	BB	Phase 6 Check
C	Phase 8 Don't Walk Driver	CC	Phase 6 On
D	Phase 8 Red Driver	DD	Phase 6 Next
E	Phase 7 Yellow Driver	EE	Phase 7 Hold
F	Phase 7 Red Driver	FF	Phase 8 Check
G	Phase 6 Red Driver	GG	Phase 8 On
H	Phase 5 Red Driver	HH	Phase 8 Next
J	Phase 5 Yellow Driver	JJ	Phase 7 Walk Driver
K	Phase 5 Ped Clear Driver	KK	Phase 7 Ped Clear Driver
L	Phase 5 Don't Walk Driver	LL	Phase 6 Walk Driver
M	Phase 5 Next	MM	Phase 7 Check
N	Phase 5 On	NN	Phase 7 On
P	Phase 5 Veh Call Det	PP	Phase 7 Next
R	Phase 5 Ped Call Det		
S	Phase 6 Veh Call Det		
T	Phase 6 Ped Call Det		
U	Phase 7 Ped Call Det		
V	Phase 7 Veh Call Det		
W	Phase 8 Ped Call Det		
X	Phase 8 Hold		
Y	Force Off Ring 2		
Z	Stop Timing Ring 2		
a	Inhibit Max Termination Ring 2		
b	Spare 1		
c	Coded Status Bit C Ring 2		
d	Phase 8 Walk Driver		
e	Phase 8 Yellow Driver		
f	Phase 7 Green Driver		
g	Phase 6 Green Driver		
h	Phase 6 Yellow Driver		
i	Phase 5 Green Driver		
j	Phase 5 Walk Driver		
k	Phase 5 Check		
m	Phase 5 Hold		
n	Phase 5 Omit		
p	Phase 6 Hold		
q	Phase 6 Omit		
r	Phase 7 Omit		
s	Phase 8 Omit		
t	Phase 8 Veh Call Det		
u	Red Rest Mode Ring 2		

- v Omit All Red Ring 2
- w Phase 8 Ped Clear
- x Phase 8 Ped Green Clear
- y Phase 7 Don't Walk
- z Phase 6 Don't Walk

(10) Cabinet Wiring. All cabinet wiring shall be neatly bundled and attached to the sides and back of the cabinet. No stick-on pads will be acceptable. Wiring must be attached to cabinet wall using screws.

Unless otherwise required to accommodate the phase sequence called for on the plans, cabinets shall be wired as follows:

- Four (4) phase cabinets shall be wired for four (4) vehicular phases, 3 pedestrian phases, and 2 overlap phases (set up as the 1+2 and 2+3 overlaps), with the signal monitor programmed accordingly.
- Eight (8) phase cabinets shall be wired for eight (8) vehicular phases and 4 pedestrian phases with the signal monitor programmed accordingly.

(11) Colors of Signals During Flashing Operation. During flashing operation, the colors of the signals shall be as follows unless otherwise called for on the plans:

(i) Single-ring sequences:

- The signals for phase 2 shall flash yellow;
- If phase 1 is a protected-permitted left-turn (i.e., has a 5-section signal head), the circular yellow section in its 5-section head shall flash yellow; otherwise, the signals for phase 1 shall flash red; and
- All other signals shall flash red.

(ii) Dual-ring sequences:

- The signals for phase 2 and 6 shall flash yellow;
- If phase 1 is a protected-permitted left-turn, the circular yellow section in its 5-section head shall flash yellow; otherwise, the signals for phase 1 shall flash red;
- If phase 5 is a protected-permitted left-turn, the circular yellow section in its 5-section head shall flash yellow; otherwise, the signals for phase 5 shall flash red; and
- All other signals shall flash red.

During flashing operation, all signals facing the same approach shall flash concurrently.

A circuit shall be provided and connected to the conflict monitor to cause the signals to flash when a conflict exists.

The flash colors shall be programmed by the Contractor to meet the requirements listed above.

Re-programming shall be accomplishable by adjusting wires on the signal terminal points. This process shall require no tools other than a screwdriver.

- (12) Dimensions and Equipment Locations. Dimensions and equipment locations shall be supplied consistent with the following minimum and maximum dimensions and equipment locations:
- (i) Top shelf positioned to allow 100 mm above controller to top of cabinet and 100 mm on each side of controller to the sides of the cabinet.
 - (ii) Second shelf-positioned approximately 200 mm below the top shelf to allow for a 150 mm high amplifier with 50 mm space between top of amplifier and bottom of top shelf.
 - (iii) Width of cabinet must allow at least 50 mm clearance on each side of the set of amplifiers from the terminal strips mounted on the sides of the cabinet.
 - (iv) Third shelf (optional) - required if the top and second shelves will not accommodate the conflict monitor, amplifiers and other equipment as required. The third shelf shall allow for the same top and side clearance as on the second shelf.
 - (v) Load switches - mounted below the bottom shelf at the left rear of the cabinet. With the relays in their bases, a minimum clearance of 50 mm shall be maintained below the bottom shelf and from the terminal blocks mounted on the sides of the cabinet.
 - (vi) Field connectors - are to be at the bottom rear of the cabinet on horizontal terminal strips. Terminal strip blocks shall be positioned not less than 50 mm nor more than 100 mm from the cabinet bottom.
 - (vii) Field loop connections are to be made on terminal strips located on the left wall of the cabinet below the bottom shelf.
 - (viii) Loop amplifier cabinet connections - are to be made on terminal strips on the left wall of the cabinet at the same level as that of the loop amplifier shelf with connections available for AC+, AC-, logic common, and the appropriate input to the controller for each module.
 - (ix) Cabinet power connections are to be made on the right wall of the cabinet below the bottom shelf and 50 to 100 mm above the bottom of the cabinet.
 - (x) The maximum outside dimensions of a base-mounted cabinet (exclusive of mounting flanges) shall not exceed 1425 mm in height, 1020 mm in width, and 765 mm in depth.
- (13) Switches Inside Main Door.
- (i) On/Off power switch: Mounted on the inside of the main cabinet door shall disconnect all equipment in the cabinet from the 120 VAC service line current with the exception of the cabinet light and the duplex convenience receptacle.
 - (ii) Automatic/Flashing switch: Mounted on the inside of the main cabinet door shall preempt the normal signal display and initiate the specified flashing display. The controller shall continue to operate during this flashing mode.
- (14) Police Panel. All cabinets shall be furnished with police compartment extending into the cabinet

shall have all exposed electrical facilities enclosed in a protective housing. The police compartment shall be equipped as follows:

- (i) On/Off power switch: Operates same as on/off power switch inside the main door.
 - (ii) Automatic/Flashing switches: In flashing position, the normal red, yellow, and green signal display shall be preempted for the flashing operation. Upon resuming automatic operation, the controller display shall be in the pre-programmed start-up orientation.
 - (iii) Normal/Manual switch: When in manual, this switch shall stop the automatic sequence of the controller and hold the existing display until manually advanced into the next interval. When in normal, the automatic control sequence shall continue.
 - (iv) A miniature panel connector for connecting a detachable hand held push button for manual operation. The connector shall be a Canon #WK-3325 or exact equivalent.
 - (v) A quality retractile cord with molded hand held push button with attached connector plug for engaging the connector described above. The retractile cord shall be capable of an extension of 2.1 meters minimum and shall be stored in the police compartment when not in use.
- (15) Conflict Monitor. Each cabinet shall have a 12-channel conflict monitor which meets the requirements of section 6.06.
- (16) Load Switches, Flash Transfer Relays, and Flasher. All load switches shall be three-circuit solid-state load switches conforming to NEMA Section 5. Indicators on the front panel of the load switch shall indicate the status of the input side of the load switch. These switches shall isolate the 24 volt DC signal logic outputs of the controller from the 120 VAC power line and field terminals so as to prevent high energy line transients from entering the controller unit. Each load relay circuit shall optically isolate the field terminal from the controller, shall turn on at zero volts, and be rated at 25 amps output load at 120 VAC. Load switches for vehicular and pedestrian indications shall be interchangeable. Each output shall be driven by a separate controller input, no logic circuitry is permitted in load switches. No reed switches shall be permitted.

Each load switch base shall be identified by phase number and overlap number as applies. Each relay base and power relay base shall be properly identified. No cabinet equipment may obstruct these identifications.

Each cabinet shall be furnished with and wired for a jack-mounted, dual circuit, all solid-state flasher unit. The flasher shall have a duty of 50 percent at a flash rate of 1 Hertz. The flasher shall be wired into the cabinet to provide optionally a yellow/red flash display or an all-red flash display. The flasher shall be rated at 25 amperes per circuit at 120 VAC. Each circuit shall use the same type load cube specified for the signal load switch. A heat sink shall be made a part of the flasher body. Two (2) LEDs shall be incorporated into the flasher to indicate circuit actuation. Load cubes shall be hard-wired to the flasher outputs without the use of printed circuit boards.

Each base-mount cabinet shall be supplied with twelve (12) load-switch sockets, and six (6) flash transfer relays. Each pole-mounted and pedestal-mounted cabinet shall be supplied with eight (8) load-switch sockets, and four (4) flash transfer relays. The number of load switches supplied shall be eight (8) and four (4), respectively, except that a greater number shall be supplied if required to accommodate the phasing called for on the plans.

- (17) Detector Amplifiers. Each controller cabinet shall be supplied with harnesses for four-channel

shelf-mounted detector amplifiers which meet the requirements of Subsection 6.07 below. The number of harnesses shall be as follows:

- One (1) or more harnesses to accommodate the number of local detector amplifier channels called for in the plans in the "Summary of Intersection Work, Part 1" plus a minimum of two (2) spare channels.
- One (1) or more harnesses to accommodate the number of system amplifier channels called for in the plans in the "Summary of Intersection Work, Part 1."

(18) Fiber Optic Communications Interface. Except for the test controller cabinets at the Signal Shop, each controller cabinet and each reversible lane controller cabinet shall be supplied with a Fiber Optic Communications Interface which meets the requirements of Subsection 6.08 below.

(19) Miscellaneous Required Facilities.

- (i) A minimum of two (2), fully adjustable, metal shelves with brackets to support controller, signal monitor, detector amplifiers and other accessory equipment. The shelves shall be capable of vertical adjustment through virtually the full height of the cabinet.
- (ii) Electric service line terminals for 6 gauge copper with 30 ampere circuit protection. Base-mounted cabinets shall have the load split between two (2) 30 amp brakes - one for vehicle signals and one for pedestrian signals.
- (iii) 120 Volt duplex convenience receptacle with separate 30 ampere circuit protection.
- (iv) Insulated barrier terminals shall be used for detector field connections, AC power supply for amplifiers, and controller inputs from amplifiers. Quantities of terminals shall be supplied for the above connections as follows:
 - Four phase controllers - 36 terminal positions; and
 - Eight phase controllers - 48 terminal positions.
- (v) Grounded neutral buss with multiple screw terminals for 12 gauge copper signal neutrals, and 4 gauge copper earth connections.
- (vi) Insulated barrier terminals (2 positions per phase module) for connection of 12 gauge copper signal display field wires.
- (vii) Insulated barrier terminals (5 positions per phase module) for connection of 12 gauge copper signal display field wires.
- (viii) Insulated barrier terminals for internal wiring interconnect of all other cabinet accessories and circuitry.
- (ix) All barrier terminal blocks shall be Cinch Type 150 with numbering strip or equal. This type and size terminal block shall be provided for all applications including controller inputs and outputs, field connections, and detector connections. Terminal pairs shall use a minimum 10-32 size screw and have a minimum center-to-center distance between terminal pairs of 16 mm.
- (x) A 120 VAC 20 watt, fluorescent light fixture mounted on the cabinet ceiling at the front of

the cabinet. Fixture shall employ #F20T12/CW20 watt fluorescent tube. An automatic switch shall turn the light on when the main cabinet door is open and turn it off when the door is closed.

- (xi) Detector push button switches shall be provided for placing vehicular and pedestrian calls on each individual phase separately. A sufficient number of switches shall be provided to serve the maximum phase capability of the controller unit supplied in case of future expansion. Switches shall be permanently labeled and identified. The switches shall be located such that calls are not inadvertently placed when the cabinet door is closed against control wiring.
- (xii) Each cabinet shall have provision for all additional equipment associated with the future expansion to full functional capability including but not limited to load switch bases, complete cabinet wiring, field connection terminals and detector terminals.
- (xiii) A clear RE-SEALABLE, plastic envelope shall be attached with screws to the inside of each cabinet door for storage of the cabinet wiring prints. This envelope shall be mounted so as to avoid restriction of the circulation of air into and out of the cabinet.

6.06 Conflict Monitor. A twelve (12) channel conflict monitor which meets or exceeds all requirements of NEMA Section 6 shall be furnished and installed in each new cabinet provided by the Contractor.

Each new conflict monitor shall provide the following features:

- (1) Dual Indication Monitoring. This monitoring function shall be required to detect simultaneous indications of active green, yellow, walk and red field signal outputs on the same channel. A dual indication fault shall place the monitor into the fault mode causing the output relay contacts to transfer. Dual indication monitoring shall be enabled concurrently with clearance monitoring on a per channel basis through switches to be supplied on the front panel.
- (2) Conflict/Voltage Monitor Operations. One of three different groups of prohibited dual combinations shall be selected via front panel "dual select" switches to be provided on the front panel for all channels which have been enabled for dual indication monitoring.

DUAL SELECT SWITCH (TO BE PROVIDED)

<u> A </u>	<u> B </u>	<u>COMBINATIONS_PROHIBITED_</u>
OFF	OFF	NONE (NO DUAL MONITORING)
OFF	ON	[(G OR W) AND Y]
ON	OFF	[(G OR W OR Y) AND R]
ON	ON	[(G OR W) AND Y] OR [(G OR W OR Y) AND R]

(NOTE: A and B "ON" shall be equivalent to only (G and W) allowed.)

*DUAL INDICATION MONITORING SHALL BE DISABLED WHEN THE RED MONITORING ENABLE INPUT IS REMOVED.

An open or no load condition (i.e., burned out bulb) shall be detected as an active signal due to load switch leakage current and shall cause a dual indication fault. Dual indication monitoring should also anticipate a possible conflict in the event that a proceed signal on a channel is constantly detected as active.

- (3) Green-Yellow Dual Indication Monitoring. This monitoring function shall be provided to detect a simultaneous indication of active green and yellow field signal outputs on the same channel. It

will be used to monitor channels which have an unused red field signal output tied to AC+ (i.e., five section signal head) to be enabled by lacing a front panel option switch labeled "green-yellow enable" in the "ON" position. A green-yellow dual indication fault shall place the monitor into the fault mode causing the output relay contacts to transfer. Green-yellow dual indication monitoring should be enabled concurrently with dual indication monitoring. When green-yellow dual indication monitoring is to be enabled, all channels which have not been selected for dual indication monitoring via front panel switches shall be individually monitored for simultaneous indications of active green and yellow field signal outputs. Any channels which have been selected for dual indication monitoring shall function as described above. Green-yellow dual indication monitoring shall be disabled for all channels when the red monitoring enable input is removed.

- (4) Clearance (Short or Absent Yellow) Monitoring. This function shall be provided to detect the absence of a minimum 2.8 second period of an active yellow field signal output during a red to green to yellow to red sequence. Clearance monitoring to be enabled concurrently with dual indication monitoring on a per channel basis via front panel switches to be provided.

Clearance monitoring is to be disabled for all channels when the red monitoring enable input is removed.

A clearance (short or absent yellow) fault condition shall place the monitor into the fault mode causing the output relay contacts to transfer. This shall occur when a red input signal to a channel is active following the termination of an active yellow input signal which is less than 2.8 seconds in duration.

- (5) Controller Watchdog Monitoring. This function shall be provided to monitor an optional watchdog output from the cabinet controller circuitry. The cabinet controller should toggle the watchdog outputs logic state once every 100 milliseconds. Failure of the monitor to receive a change in state from the controller unit for 1500 milliseconds (± 100 milliseconds) shall place the monitor into the fault mode and cause the output relay contacts to transfer. An AC+ brownout condition or a complete loss of AC+ power shall reset the watchdog fault state of the monitor.

NOTE: The watchdog logic input shall be harnessed to a spare pin on the front panel connector.

- (6) Walk Disable (Red Monitoring). This option shall be provided to modify the operation of red monitoring. When enabled, the red monitoring function shall not monitor the walk field outputs. Absence of signals on the green, yellow, and red field outputs of a channel shall place the monitor into the fault mode and cause the output relay contacts to transfer.
- (7) Non-Volatile Fault Memory. The loss of AC+ power to the monitor shall not reset a fault condition (conflict, dual indication, red failure, clearance, or a voltage monitor latch option is enabled). A BND or controller watchdog fault shall be reset by an AC+ brownout or drop out condition. The monitor shall store the fault and channel indicator status and the time and date the fault occurred into a non-volatile RAM memory device. Should an AC+ power interruption occur while the monitor is in the fault mode, then upon restoration of AC+ power, the output relay shall remain in the fault and the correct fault and channel information shall be displayed. This mode shall be maintained until the monitor receives a reset command from the reset button or the external test reset input.
- (8) Real-Time Clock/Calendar. A real-time clock shall be provided in the monitor to identify each fault occurrence with the time of day and date. This information shall be displayed and stored along with the fault status and field output status when the monitor is triggered by a fault condition. The real-time clock shall be backed up by a long life lithium energy cell to maintain

accurate time keeping even during AC+ interruptions. Accuracy should remain within approximately +3 minutes per month. Daylight saving time adjustments are to be made to the time of day on the last Sunday of October and the first Sunday of April. The date and month are to be adjusted for leap years.

Setting the correct time of day and date shall be accomplished using the mode and increment buttons on the front panel.

- (9) Fault Data Logging. In addition to displaying the fault status and field output status for a fault condition which may have the monitor unit currently triggered, the monitor shall automatically update and maintain a complete record of the last nine faults which caused the unit to trigger. Reviewing these events shall be accomplished at any time by depressing a "Inc/Prev.Fail" button to be provided on the front panel. This "history" shall be maintained in non-volatile RAM memory and shall not be lost due to AC+ power interruptions.

Faults due to the program card not in place or monitor failures due to internal hardware/firmware problems (monitor fail LED illuminated), are not to be included in the data log.

A controller voltage monitor (CVM) log disable option switch shall be provided on the front panel to disable data logging of CVM failures. This option preserves the fault "history" when the CVM input is used to transfer from normal operation to flashing operation for night time flash or time-of-day flash requirements.

- (10) Program Card Readback. In order to verify that the program card information has been properly read by the monitor, the channels programmed as "permissive" on the program card are to be displayed on the field output status display, if desired. This shall be accomplished using the mode and Inc. buttons to be supplied on the front panel.
- (11) Program Card Absent. If the program card is absent or not seated properly in the edge connector, the monitor shall enter the fault mode and cause the output relay contacts to transfer. The "program card" indicator on the fault status display shall be displayed to indicate this condition. A manual reset or external test reset shall be required after the program card is properly seated.
- (12) Internal Watchdog. The monitor shall generate an internal watchdog pulse from the microprocessor. It shall occur once per line cycle near the start of its program loop. If the internal hardware does not detect a watchdog pulse within 100 milliseconds, the monitor shall enter the fault mode causing the output relay contacts to transfer. A "monitor fail" LED on the front panel shall illuminate to indicate a monitor hardware and/or firmware failure.
- (13) Reset Input Detection. This function shall be provided to prevent the cabinet controller from being operated with the monitor disabled due to a faulty reset button or external test reset input. The monitor shall monitor the state of the front panel reset button and the external test reset input. When a reset command is detected from either input, the monitor shall remain in the reset mode with all indicators illuminated, the output and start relays energized, and monitoring functions disabled. If the reset command lasts for a continuous duration of 120 seconds, the monitor shall then automatically enter the normal mode and begin monitoring functions, ignoring the state of the reset inputs.
- (14) Voltage Monitor Fault Latch. When the voltage monitor fault option is enabled by the front panel switch to be labeled "VM latch" input, the absence of the proper voltage level at either the CVM input or the two 24 VDC inputs (24V-I & 24V-II) shall place the monitor into the fault mode causing the output relay contacts to transfer. The appropriate fault indicator(s) and the time and date shall be displayed on the fault status display along with the field output signals active at the

time of the voltage fault. Restoration of the voltage levels shall not reset the fault state of the monitor. Only a manual reset or external test reset command shall reset the monitor. IF THE VM LATCH AND CVM LOG DISABLE OPTION SWITCHES ARE BOTH ON, CVM FAILURES SHALL NOT BE LATCHED OR DATA LOGGED.

- (15) Display LCD & LED Test. The monitor shall display all front panel LCD indicators and illuminate all front panel LED indicators when a reset command is issued by the front panel reset button or external test reset input. This function shall provide a way to check the operation of all front panel indicators.
- (16) Memory Test. The monitor is to verify the proper option of the memory (RAM & EPROM) devices required to operate the monitor. This test shall be performed when AC+ power is applied or a reset command is issued to the monitor. If a monitor will enter the fault mode causing the output relay contacts to transfer, the "monitor fail" LED indicator on the front panel shall illuminate to indicate a monitor hardware and/or firmware failure.
- (17) Fault Timing and Configuration Display. The fault timing specifications for conflict, red fail, voltage monitoring, dual indication, clearance fail, and controller watchdog fail (if enabled) as set by the factory shall be reviewed on the fault status display using the Mode and Inc. buttons on the front panel. Timing values for conflict, red fail, voltage monitoring, and dual indication are to be shown in milliseconds. Timing values for clearance fail and controller watchdog fail are to be shown in seconds. Also to be displayed are the channels selected by the switches. If the 24V inhibit input is active, the value displayed for +24V-I and +24V-II shall be shown as "off". Similarly, if red enable is not active the value shown for red fail, dual indication, and clearance fail shall be "off". If both dual select switches and the GY enable switch are off, the value shown for dual indication shall be "off". If the BND monitoring function is disabled the display shall show "off". The "off" display shall indicate that the selected monitor function is disabled.
- (18) BND (Blinking/Noise/Dimming) Error Detection. This error detection shall be provided to supplement the unique firmware sampling and digital filtering method for the field input signals which are to provide limited noise immunity. The BND error detection function shall be designed to recognize many of the possible input waveforms and will place the monitor into the fault mode and cause the output relay contact to transfer if the varied and erratic signal conditions exist as described below for a pre-determined period of time. The "BND fail" indicator and the front panel channel indicator(s) on which the fault occurred shall be displayed. An AC+ brownout condition or a complete loss of AC+ power shall test reset the BND fault state of the monitor:
 - (i) Blinking. A signal condition that may exist under certain abnormal circumstances such as: controller output malfunction (i.e., output toggling, pinwheeling, etc.); the output of a load switch intermittently shorting to ground; intermittent field wiring due to corrosion, etc.
 - (ii) Noise. Constant noise on the field output signal that may affect the integrity of the input sample if it occurs exactly within the narrow sampling "window". Depending on the severity and repetition rate of the input noise, a BND error should be detected after the samples have been corrupted for a period of 30 to 200 lines cycles.
 - (iii) Dimming. The sampling and filtering algorithm allows only half wave (positive or negative) suppressed dimming. Other dimming waveforms may be achieved under cabinet controller firmware control and shall be detected as a BND error within approximately 30 periods of the input waveform.
- (19) Front Panel Description.

- (i) *Field Output Status Display.* The field output status displays shall be liquid crystal displays (LCD). The monitor displays shall exceed the minimum NEMA requirements by showing all four field output signals per channel. When the unit operates normally without a fault condition present, the currently active field output signals shall be displayed. Once triggered by a fault condition, the displays shall retain the signals active at the time of the fault. Dark solid arrows shall be displayed below the channel number for each channel involved in the fault.
- (ii) *Fault Status Display.* The main status display shall be a liquid crystal display (LCD). The monitor shall display nine fault conditions in addition to the time and date that the fault occurred. If the unit is operating normally without a fault or voltage monitor condition present, only the current time and date shall be displayed.
- (iii) *Voltage Monitor Indicators (CVM/WD, 24V-I, 24V-II).* One or more of these indicators shall be displayed along with the field output signals active at the time the unit was triggered if the corresponding voltage input is below the minimum specified level. If the voltage monitor latch (VM latch) option is enabled and the unit is triggered by an improper voltage condition, the corresponding indicator(s) shall remain displayed until the unit receives a reset command from the manual reset or external test reset input. If the VM latch and CVM log disable option switches are both enabled (on), CVM failures shall not be latched or data logged. If the controller watchdog monitor option (WD enable) is enabled and the unit is triggered by a controller watchdog output failure, the CVM/WD indicator shall remain displayed until the unit receives a reset command from the manual reset or external test reset input or the AC+ voltage level drops below the specified drop-out level.
- (iv) *Conflict Indicator.* A conflict indicator shall be displayed when a conflicting proceed signal fault is detected. The field output status displayed shall show all active field output signals at the time of the conflict. Dark solid arrows shall be displayed below the channel number for each channel involved in the fault.
- (v) *Dual Indicator.* A dual indication indicator shall be displayed when a dual indication fault is detected on a channel. The field output status display shall show all active field output signals at the time of the dual indication fault. Dark solid arrows shall be displayed below the channel number for each channel involved in the fault.
- (vi) *Red Fail Indicator.* A red fail indicator shall be displayed when an absence of signal (dark signal head) is detected on a channel. The field output status display shall show all active field output signals at the time of the red failure. Dark solid arrows shall be displayed below the channel number for each channel involved in the fault.
- (vii) *Clearance Indicator.* A clearance fail indicator shall be displayed when a short (less than 2.8 seconds) yellow signal or absence of yellow signal is detected on a channel(s) during a red to green to yellow to red sequence. The field output status display shall show all active output signals at the time of the clearance fault. Dark solid arrows shall be displayed below the channel number for each channel involved in the fault.
- (viii) *BND Indicator.* A BND fail indicator shall be displayed when a blinking/noise/dimming fault is detected on a channel. The field output status display shall show all active field output signals at the time of the BND fault. Dark solid arrows shall be displayed below the channel number for each channel involved in the fault. If the BND fault is detected on the red enable input then no dark arrows should be

displayed.

- (ix) Program Card Indicator. A program card indicator shall be displayed if the program card is absent or not seated properly in the edge connector. A field output status shall be displayed to show all active field output signals at the time of the fault. A manual reset shall be required after program card is properly seated.
- (x) Previous Failure Indicator. The monitor shall retain complete information on the last nine consecutive faults which triggered the monitor in addition to the current fault information if the unit has been triggered by a fault condition. The previous fault information should be displayed at any time by depressing a "Inc/Prev.Fail" button, to be provided. The "previous failure" indicator shall be displayed with the number if the fault also shown (previous failure 1 [PF 1] is the most recent failure logged). Each button closure shall display the next previous failure information, returning to the current display on the tenth button closure.
- (xi) Time and Date Display. A clock and calendar display shall alternate between the time of day and the date. The time shall be denoted by either an "AM" or a "PM" indicator. The date shall be denoted by the "date" indicator. If the monitor is displaying current fault information, then the time and date shall indicate when the fault occurred. If the monitor is displaying previous fault information, then the time and date shall alternate with the previous fault number and indicate when the fault occurred. Otherwise, the current time of day and date shall be displayed.
- (xii) DC Voltage Monitor.

+24 VDC Inputs (Inactive).....less than +18 VDC
(Active).....greater than +22 VDC

- (xiii) Logic Inputs

Controller voltage monitor,
Ext. reset, +24V monitor inhibit,
Controller watchdog input
(Active).....less than +8 VDC
(Inactive).....greater than +16 VDC

- (xiv) Timing Functions

Dual indication
(No Fault).....less than 20 milliseconds
(Fault).....equal to or greater than 2.8 seconds

Watchdog
(No Fault).....less than 1400 milliseconds
(Fault).....greater than 1600 milliseconds
(Typical).....1500 milliseconds

AC+ interruption
(Disable).....greater than 475 milliseconds (+25 milliseconds)

Minimum flash after disable.....4 to 15 seconds (± 1 second)

Start delay relay timer.....2.5 seconds (± 1 second)

(20) LED Displays.

- (i) Power Indicator. A power LED indicator is to be provided and to blink at a rate of 2 Hz when the AC+ line voltage goes below the drop-out level (92 VRMS). It shall illuminate steadily when the AC+ line voltage returns above the brown-out restore level (100 VRMS). The indicator shall extinguish when the AC+ line voltage is no longer sufficient to provide the DC voltages necessary for proper monitor operation (approximately 60 VRMS).
- (ii) Fault Indicator. A fault LED indicator shall illuminate when the unit has been triggered by a fault condition or has sensed a +24V voltage monitor condition and indicates that the monitor has caused the output relay contacts to transfer.
- (iii) Monitor Fail Indicator. A monitor fail LED indicator shall illuminate when one of the following internal monitor failures are detected: internal watchdog failure, memory test failure, or internal power supply failure. This indicator is to inform the service technician of a monitor hardware and/or firmware failure.

(21) Miscellaneous Requirements.

(i) Power.

Operating Line Voltage.....75 to 135 VAC RMS

Operating Line Frequency.....60 ± 3 Hz Power

Consumption.....5 W (nominal)

Battery Life Time.....Minimum 8 Years

Minimum Battery Voltage.....2.2 Volts

- (ii) Printer. The monitor shall be equipped with an infrared printer output to provide a hard copy of the data log and monitor setup. The Contractor shall furnish five (5) compatible printers equal to the Hewlett Packard Model HP 82240A infrared printer. Such printers shall be considered incidental to controllers and cabinets and will not be paid for directly.

6.07 Vehicle Detectors. This subsection defines the minimum acceptable design, operational and functional performance requirements for high performance, multiple channel, inductive loop vehicle detection systems.

- (1) General. The detector shall be microprocessor controlled and fully digital, self-tuning. The detector shall be configured as a rack mounted printed circuit board (PCB) for insertion into a NEMA (TS1 or TS2) card rack. Detectors shall also be suitable for use in California/New York TYPE 170/179 or ATC input files.
- (2) Ports. Each detector unit shall have two serial ports. A front panel RS-232 port and send/receive pins on the card edge connector. Each port shall be capable of party line communication with up to 8 detectors on the party line.
- (3) Interface Software. Interface software shall be provided for use with Windows 3.1 or higher.

This software shall provide an activity screen to display loop system operating characteristics, for each channel, to aid in system setup and diagnostics including:

- Loop Status - Ready, Detect, Fault mode and Reset
- Loop inductance (L) in Microhenries (μH)
- Loop frequency (F) in Kilohertz (kHz)
- Reference frequency (F) in Kilohertz (kHz)
- Maximum Delta inductance (ΔL) in Nanohenries (nH)
- Green Input Signal (on/off)
- Last Fault (type) - Open, Shorted, $\geq 25\% \Delta L$
- When Occurred (Date/Time)
- Detection time in milliseconds (ms)
- Vehicle Count with count Reset button

The activity screen shall include a button to take a snapshot of live data that can be frozen and/or saved to file.

The interface software shall:

- Allow assignment of channel number, loop ID and loop length to enable accurate measurement of vehicle occupancy times. Data shall be available via the serial ports.
- Allow assignment of loop-to-loop distances to enable accurate speed measurement and vehicle length measurement. Data shall be available via the serial ports.
- Provide a vehicle log setup screen and a log screen to report date, time, channel number, loop description, and;
 - ☐ Duration of detection in milliseconds
 - ☐ Loop-to-loop time in milliseconds
 - ☐ Vehicle length in feet or meters
 - ☐ Speed in miles per hour or kilometers per hour.

(4) Miscellaneous Requirements.

- The detector shall include an option to enable a (50 Hz or 60 Hz) filter to insure reliable detection thresholds in power-line-noise environments.
- The Detector shall include optically-isolated, solid-state outputs designed to provide a continuous "fail-safe" (fail-call) output in the event of power loss to the unit.
- The detector shall be available in both two (2) channel and four (4) channel versions.
- Both two (2) and four (4) channel versions shall provide delay and/or extension timing capability of the detection output for each channel, when timing is specified.
- These NEMA detectors shall contain a means to disable the delay and/or extension green sense input circuit on channel four when timing units are installed into a TS2 card rack. This shall allow the wired, 44-pin, edge connector to enable the detector address bit #1 on pin #10.
- Back-plane wiring shall provide four (4) hardwired addresses, to accommodate four 4-channel units, and EIA-232 communication support. The units specified shall be tested for conformity to these requirements, utilizing properly operating loop configurations and

homerun/lead-in combinations described herein. The goal is to obtain detector units that will detect and hold presence of all licensable motor vehicles (including 70 cc motorcycles) when connected to microloop probe sets and/or loop configurations of from 1.8 m x 1.8 m up to 1.8 m x 30 m with lead-ins of from 15 m to over 300 m without detecting vehicles in the adjacent lanes. (Long loops may require special configuration such as the quadrupole configuration to insure adjacent lane rejections.)

- Detector units shall be in full compliance with the environmental, transient and size requirements of NEMA standards TS1, Section 15 and the design, operation, electrical and functional performance requirements of this specification.
- The front panel shall include erasable, write-on pads adjacent to each detect indicator to aid in identification of associated lane, function, or phase activity.
- Each channel shall include two, wide angle, high visibility LED indicators. A green LED to display channel detect output status (output state and also the status of the delay and extension timers) plus a red LED to display loop fault monitor diagnostics (open loop, shorted loop, $\geq 25\%$ inductance change).
 - ☐ The green detect LED indicators shall repetitively cycle on at:
 - 4 Hz during Delay timing.
 - 16 Hz during Extension timing.
 - During fault detection the green channel detect indicators shall provide a steady indication in either pulse or presence mode.
 - ☐ The red fault LED indicators shall repetitively cycle on for:
 - One long pulse (1 sec.) and one short pulse (.25 sec.) to indicate open loop.
 - One long pulse (1 sec.) and two short pulses (.25 sec.) to indicate shorted loop.
 - One long pulse (1 sec.) and three short pulses (.25 sec.) to indicate $\geq 25\%$ change of inductance.
- Each channel shall provide a continuous, non-resettable (fail-safe) output and indication in response to an open loop and/or open lead-in system and/or $\geq 25\%$ ΔL , except in the OFF mode (when fail-safe operation for a particular fault type is not disabled using the interface software).
- Each channel shall continue to operate with poor quality loop systems ($Q \geq 2$) including those that have a single point short to ground.
- Each channel shall tune to an external inductive load of from 20 up to 2500 microhenries.
- Each channel shall be controlled by a direct reading 16 position push-wheel switch to select a minimum of 8 pulse mode sensitivities, 7 presence mode sensitivities, Channel Reset capability and an Off mode on a per channel basis.
 - ☐ Pulse mode shall be indicated on the push-wheel switch by a pulse symbol over the channel sensitivity numeral.
 - ☐ The OFF position shall be selected by setting "X" on the switch.

- ☐ Selecting OFF shall disable channel output and indicators including fault indications.
- ☐ Pulse mode settings shall provide a single 118 ± 2 ms output pulse in response to vehicles entering a loop.
- ☐ If a vehicle remains in the sensing zone the channel shall rephase after 1.9 seconds to enable detecting additional vehicles on unoccupied portions of the loop after 2 seconds. Additionally, the rephase time shall be settable from 0.1 to 25.5 seconds using the interface software.
- ☐ Presence hold times shall be at least 4 minutes for small (70 cc) motorcycles and a minimum of at least 60 minutes for automobiles over 1 to 8, 1.8 m x 1.8 m 3-turn loops connected in series.
- ☐ Special circuitry shall prevent tune-out of continuous peak hour traffic over long or multiple small loops as long as there is vehicle motion into the sensing zone at least every 10 minutes.
- Push-wheel switches shall include 8 sensitivity threshold selections in 2:1 steps over a range of 128:1 to enable precise, predictable selection of the proper sensitivity to detect all licensed motor vehicles.
- The detector shall detect all vehicles over multiple turn loops installed in asphalt or concrete pavement and/or multiple loops that may be connected in series, parallel, or series/parallel, with lead-in/homerun lengths to over 300 meters.
- Detector units shall employ a constant $_L$ threshold that will respond to vehicle generated changes of inductance and provide a relatively constant, predictable response to small licensed motor vehicles without having to change sensitivity selections despite increased series added inductance, i.e., multiple loops connected in series with lead-in/homerun from 15 m to over 300 m.
- Each unit shall contain a common, switched, loop oscillator to eliminate mutual-interference/ magnetic-coupling (crosstalk) from multiple loops in adjacent lanes and/or allow use of overlapped loops for directional control and/or use of multi-conductor homerun cable when connected to the same detector unit.
- Each sensitivity setting shall be equated to nanohenries of inductance change ($_L$) as shown in Table 6.1.
- Each unit shall contain a frequency switch that will provide three (3) frequency selections per unit to reduce interaction with loops connected to another unit.
- Each unit shall maintain the same sensitivity (threshold in nanohenries) in any of the three (3) frequencies selected.
- ☐ The maximum response time to an instantaneous beginning or end of a stimulating inductance

Table 6.1
Sensitivity Setting
vs. Inductance Change

Sensitivity Level Setting	Nanohenries _L
C	1024
1	512
2	256
3	128
4	64
5	32
6	16
7	8

change of twice the magnitude required to detect in sensitivity levels 1, 2, and 3, when connected to typical 3 or 4 turn 1.8 m x 1.8 m loops with from 15 m to over 300 m of lead-in/homerun cable attached, shall be less than 3 milliseconds for 2-channel units, and less than 6 milliseconds for a 4-channel unit.

- Each unit shall contain a toggle switch with a spring loaded position that will Reset all channels and stable positions to allow selection of "Normal" or "Fast recovery" mode to enhance performance in left turn lanes or other queue situations.
- Detector units shall automatically self-tune within 4 seconds after application or interruption of supply voltage. Channel outputs shall display calls for a period of less than 4 seconds after which detection shall be normal.
- Each unit shall contain a remote reset input that will allow an external reset of all channels.
 - ☐ When the input voltage on pin C falls below 8 VDC for over 15 microseconds, the detector shall reset all active channels and establish a new reference for each "on" loop within 4 seconds.
- Each channel shall include a DIP switch to invoke a special Microloop mode. Setting this switch shall change the operating mode to be specific to Microloop probes.
- When Delay and/or Extension timing is specified, each channel shall include a 7 position DIP switch on the PCB to select Delay, Extension or Off, if no timing is desired.
 - ☐ Delay time shall be selectable in 0 to 63 seconds in 1.0 second increments.

- ☐ Extension time shall be selectable in 0 to 15.75 seconds in .25 second increments.
- ☐ Selection of OFF shall disable timing in both Pulse and Presence modes.
- When Delay and/or Extension timing is specified, each channel of 2 or 4 channel units shall include an external input to control the timing.
 - ☐ A true condition shall exist if the input voltage falls below 8 VDC for ≥ 17 microseconds.
 - ☐ Extension timing shall occur only if the corresponding input to the detector channel is true (low/active) and Delay timing shall only occur if the input is false (high/inactive).
- Detector units shall be designed to operate over a voltage range of from 10.8 VDC to 37 VDC.
- Units shall draw less than 50 mA per channel from the DC power source over the input voltage range.
- Each unit shall have a front panel mounted EIA 232 serial communications port to interface with PC's, or other devices.
- Design of the unit shall provide for user selectable changes in operating characteristics, to allow for modification of performance for unique or special applications, that can be obtained by invoking the options from a computer or other device connected to one of the EIA 232 serial interfaces.
- The unit shall record the occurrence of an open loop, shorted loop, or excess inductance change ($\geq 25\%$).
- The most recent type of error on each channel and the time of error occurrence shall be made available through the serial interface.
- Software command options shall exist to allow the user to:
 - ☐ Choose to eliminate the call output and induction for the open loop condition and other loop problems. It shall not affect the coded flashing fault indicators or software record of failures.
 - ☐ Eliminate the standard 1.9 second pulse rephase altogether, reduce the rephase time to 1.0 seconds or increase rephase time to 3.8 seconds.
 - ☐ Select output Pulse widths of 15 ms., 59 ms., or 236 milliseconds. Standard pulse duration is 118 milliseconds.
 - ☐ Modify minimum (small motorcycle) hold time of 4 minutes (240 seconds) to 7.6 seconds, 120 seconds, or 480 seconds.
 - ☐ Modify standard automobile hold time of typically 1 to 2 hours to .5 to 1 hour, or 2 to 4 hours.

- Modify background adapt rate from .50 Threshold/second to 0.25, or 1/second.
- The interface software shall aid in the setup of the vehicle detector units by presenting all of the user selectable parameters on the personal computer display, allowing the operator to view and change operating parameters as required. It shall be available on 90 mm-1.44 Mbyte diskette magnetic media. The software shall be compatible and fully operable when used on an Intel-compatible microcomputer with Windows 3.1 or higher.
- The user interface software shall have multiple screens to present all unit setup options, and operating parameters. It shall retrieve and display the unit and loop diagnostics, unit and system measurement values, output status, and it shall download user selectable operating parameters and defaults.
- The Loop Activity (live data) screens shall display the elements shown in Table 6.2.
- The Unit Parameters to be selected or altered shall include those shown in Table 6.3.
- Factory preset defaults shall be stored in memory. User selectable "options" shall be selectable in EEPROM via serial interfaces to modify standard operating parameters.
- In addition the TS2 Address (0-7) and the Reset input line status shall be displayed.
- The Channel Parameters to be selected or altered shall be as shown in Table 6.4.
- The units shall intermate with the 44 pin edge connector shown in Table 6.5.
- Polarization keys shall be located between pins B2 and C3, between pins E5 and F6, and between pins M11 and N12.

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Table 6.2
Loop Activity Screen Displays

Green Input Signal	On/Off
Vehicle Count	Number
Detection Time (Duration)	Milliseconds
Last Loop Fault	Open, Shorted, $\geq 25\%$ $_L$
When Occurred	Date and Time
Current Status	Normal or Fault
Call Output	On/Off
Loop Inductance	Microhenries
Loop Frequency	Kilohertz
Reference Frequency	Kilohertz
Max. Delta Inductance Change	Nanohenries
Detect Status	Detect, No detect
Vehicle Count w/Count Reset Button	Count

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Table 6.3
Unit Parameters To Be Displayed or Altered

TS2 Compatible (backpanel addressing)	Enabled/Disabled
Vehicle Count Period	0-63.5 hours (15 min., 1 hr., etc.) or Continuous
Detect Open Loop	Yes, No
Detect Shorted Loop	Yes, No
Detect $\geq 25\%$ $_L$	Yes, No
Number of Channels	2, 4
Serial Port Speed	1200, 2400, 4800, 9600 BPS
Fast Recovery Mode	On, Off
Frequency Selection	High, Medium, Low
Configuration Setup Source	Switches, or EEPROM
Power Line Frequency	Disabled, 50 Hz, or 60 Hz
Microloop Filtering	Yes, No
Noise Margin	Low, Medium, High
Rephase Delay	Off, 0.95, 1.8, 4.0, 8.0 Seconds
Output Pulse Width	15, 59, 118, 236 Milliseconds
Washout Delay	7.6, 120, 240, 480 Seconds
Adapt Rate	0, .25, 150, 1.0 Threshold per Second
Reset	Resets Unit and Data

Table 6.4
Channel Parameters To Be Selected or Altered

Sensitivity Threshold Selection	1-8 Settings in 2:1 Increments
Pulse/Presence Mode	Pulse, Presence
Delay Timing	<u>OFF</u> / 1-63 Seconds in 1 second increments
Extension Timing	<u>OFF</u> / 0.25-15.75 Seconds in 0.25 second increments
Microloop Sensors	Yes, No
Long-loop Count	Enabled, Disabled

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Table 6.5
Edge Pin Connector Assignments

Logic (DC) Ground	A	1	Delay/Ext. Ch 1 (DC+input)
DC Supply	B	2	Delay/Ext. Ch 2 (DC+input)
Remote Reset Input	C	3	Delay/Ext. Ch 3 (DC+input)
Loop in Ch 1	D	4	Loop in Ch 1
Loop in Ch 1	E	5	Loop in Ch 1
Ch 1 output (+)	F	6	Detector Address 0
Ch 1 output (-)	H	7	Status output Ch 1
Loop in Ch 2	J	8	Loop in Ch 2
Loop in Ch 2	K	9	Loop in Ch 2
Chassis ground	L	10	Delay/Ext. Ch 4 Det. address 1
AC-neutral	M	11	No connection
AC-line	N	12	No connection
Loop in Ch 3	P	13	Loop in Ch 3
Loop in Ch 3	R	14	Loop in Ch 3
Ch 3 out (+)	S	15	Detector address 2
Ch 3 out (-)	T	16	Status output Ch 3
Loop in Ch 4	U	17	Loop in Ch 4
Loop in Ch 4	V	18	Loop in Ch 4
Ch 2 out (+)	W	19	Data-Transmit
Ch 2 out (-)	X	20	Status output Ch 2
Ch 4 out (+)	Y	21	Data-Receive
Ch 4 out (-)	Z	22	Status output Ch 4

(5) Electrical Connector and Cable

Each amplifier unit shall be furnished with a ten (10) pin M.S. male connector and cable. Terminal wiring shall comply with the following code:

Ten-Pin M.S. 3106B18-1S

Pin	Cable Color Code	Function
C.	Black	115-volt AC line
A.	White	Line Neutral
H.	Green	Earth
B.	Yellow	Relay Common
F.	Blue	Relay N.O. Contact
D.	Gray	Loop
E.	Brown	Loop
G.	Red	Relay N.C. Contact
I.	-----	Not Used
J.	-----	Not Used

Each amplifier unit shall be furnished with a wiring harness with mating M.S. connector. The cable shall be color coded, as above, with insulated spade connectors and shall be minimum 48 inches in length.

(6) Traffic Detector Sensor Units

A. Inductive Traffic Detection Loop in Sawcut.

Inductive traffic detection loops shall consist of conductors embedded in the pavement to measure the inductance of passing vehicles. The loop detector conductors shall consist of wire and tubing with a THNN wire to be inserted into an approved PVC tubing.

WIRE # 14 AWG stranded THNN (UL) 600 V black.

TUBING UL FR-1 rated 150°C

Wall thickness .031"±.003".

Inner diameter nom: .86" min: .182"

max: .198"

Dielectric strength approximately 900 V/MC

The connectors shall be placed in a sawcut which shall be sealed with an approved two-part embedding sealant manufactured specifically for embedding electrical wire or cable in concrete or bituminous pavement to be mixed with sand as recommended by the manufacturer, and meeting the following:

Sp. Gr. A.B./Mix	1.1/0.98/1.04
Viscosity (CPS) @ 77°F A	800
" " " B	1,500
" " " Mix	1,200
Mix Ratio (by volume)	1:1 + 2 Sand
Pot Life (1/2 gal. @ 77°F)	13 minutes
Cure Time @ 77°F	no tackiness after 1 hour
Hardness (Shore D)	60
Tensile Elongation	Greater than 100%
Water Absorption (one day)	0.20%
Salt Water (3%) Absorption	0.20%
Oil Absorption	0.03%
Gasoline Absorption	1.00%
Volume Resistivity (77°F/150°F)	5.1X10 ¹³ OHM-CM/2.0X10 ¹⁰ HM-CM
Tensile Bond Strength to Concrete @ 77°F	350 psi
Shear Bond Strength to Concrete @ 70°F	1,500 psi

Other sealants manufactured for embedding electrical wire or cable in bituminous or concrete pavement shall not be used unless approved by the Engineer.

B. Pedestrian Push Button Detectors.

The Pedestrian Push Button Assembly for use with the controllers shall be actuated by the pushing of a 2-inch diameter, round, aluminum spring return button which shall cause the closure of a set of internal contacts. The push button / contact assembly shall be screwed into a one-piece, Federal Yellow painted aluminum die cast, cylindrical housing suitable for mounting on a steel pole in conformance with the Plans. The push-button assembly shall be constructed and gasketed to prevent accidental shock and provide weatherproof and freezeproof operation.

6.08 Fiber Optic Communications Interface.

- (1) General. Each new controller cabinet (excluding the test cabinets at the Signal Shop) shall have a Fiber Optic Communications Interface. Each such interface shall either be a Type 1 interface or a Type 2 interface, as called for by the application shown on the plans:
 - (i) At locations where the plans call for only one fiber optic cable with six (6) or fewer fibers to enter a controller cabinet (including locations where the plans call for the installation of a prefabricated drop cable, a Type 1 Fiber Optic Communications Interface shall be provided. (At these locations, no provisions are required in the controller cabinet for splicing of optical fibers.)
 - (ii) At all other locations, a Type 2 Fiber Optic Communications Interface shall be provided. (At these locations, provisions are required in the controller cabinet to splice optical fibers.)
- (2) Type 1 Fiber Optic Communications Interface. Each Type 1 fiber optic communications interface shall consist of one of the following:
 - (i) A prefabricated (i.e., factory-terminated) MMFO drop cable of sufficient length to extend with adequate slack to the splice cabinet or aerial splice enclosure shown on the plans. Inside of the controller cabinet, a minimum of five (5) meters of coiled slack shall be provided and secured to the cabinet. The incoming drop cable shall be securely tied to the cabinet walls with tie-wraps at intervals of not more than 150 mm between the point where the drop cable enters the cabinet and the coiled slack. Between the coiled slack and the controller, approximately 1.2 meters of length shall be provided for connection to the front panel of the controller. The prefabricated drop cable shall meet the requirements of Subsection 725.09(d).
 - (ii) A fan-out kit, pre-connectorized with ST-compatible connectors, which shall be used to link the incoming 6-fiber MMFO cable with the controller. The fan-out kit shall provide six (6) one meter lengths of fan-out tubing secured in a modular assembly. The jacket of the incoming cable shall be stripped back and each fiber shall be inserted into a fan-out tube. Each fan-out tube insert shall then be snapped into a protective inner housing. When all inserts have been loaded, an outer housing shall be installed to complete the assembly. The resulting fanned-out fibers shall be connectorized and each shall have a loss which does not exceed 0.3 dB. Each fan-out tube shall provide three levels of protection for the fiber, including a Teflon inner tube, a dielectric strength member, and an outer PVC jacket.
- (3) Type 2 Fiber Optic Communications Interface. Each Type 2 fiber optic communications interface shall include the following:
 - (i) One (1) splice tray housing with front-panel ST-compatible connectors;
 - (ii) Two (2) or more splice trays; and
 - (iii) Four (4) prefabricated MMFO patch cables (jumpers) which shall have ST-compatible connectors on each end to connect the front panel of the tray housing with the front panel of the traffic signal controller. Each patch cable shall meet the requirements of Subsection 725.09(e).
- (4) Splice Trays. Each splice tray shall be metallic and shall accommodate a minimum of twelve (12) fusion splices plus a minimum of six (6) mechanical splices. The tray shall consist of an aluminum base and an aluminum cover. The design of the tray shall provide physical protection for both types of splices.

Each tray shall have crimpable metal tabs to provide strain relief for the buffer tubes. Additional strain relief points

shall be provided for tie-wrapping buffer tubes or pigtails to the tray. Each tray shall contain organizers which shall hold and protect each type of splice.

The approximate dimensions of each tray shall be 300 mm by 100 mm by 5 mm. A minimum of two (2) trays shall be provided in each housing. Additional trays shall be provided as necessary to accommodate the number of fusion splices required by the initial system construction shown on the plans.

- (5) Tray Housing. Each tray housing shall be made of aluminum or stainless steel and shall have the following features:
- (i) Accommodation for the number of splice trays required by the initial application called for on the plans plus 25 percent;
 - (ii) Hinged, lockable door; and
 - (iii) Front panel with a minimum of twelve (12) ST-compatible connectors. A connector shall be provided for each fiber of each FO cable which is brought into the cabinet. The rear of each connector shall have a factory-connected pigtail, which shall be fusion spliced by the Contractor in a splice tray to the incoming or outgoing fibers.

Each splice tray shall slide into the housing and shall securely lock into place. Tray housings may be wall-mounted or rack-mounted at the Contractor's option.

6.09 Shelby County Controller Identification by Type:

- (1) Type 2A: Two phase, semi-actuated, solid-state, digitally timed with pedestrian timing for both phases and dual side street maximum.

Type 2B: Two phase, fully actuated, solid-state, digitally timed with pedestrian timing for both phases and dual maximum for each phase.

Type 3A: Three phase, fully actuated, solid-state, digitally timed with pedestrian timing for the artery and the cross street phases and dual maximum for each phase. An advance or leading protected left turn phase is the identifying characteristic of this type.

Type 3T: Three phase, fully actuated, solid-state, digitally timed with pedestrian timing for the artery and the cross street phases and dual maximum for each phase. A trailing or lagging protected left turn phase is the identifying characteristic of this type.

Type 4: Four phase, fully actuated, solid-state, digitally timed with pedestrian timing for the artery and the cross street phases and dual maximum for each phase. The identifying characteristic is a protected left turn phase on one approach of both the artery and the cross street.

Type 5: Five phases, fully actuated, solid-state, digitally timed with pedestrian timing and volume density for two artery and two cross street phases and dual maximum for each of the two left turn phases. The identifying characteristic is a protected left turn phase on both artery approaches with any phase capable of concurrent but independent timing with another non-conflicting phase.

Type 6: Six phase, fully actuated solid-state, digitally timed with pedestrian timing and volume density for two artery and two cross street phases and dual maximum for each of three left turn phases. The identifying characteristic is a protected left turn phase on one cross street approach and a protected left turn on both artery approaches with any phase capable of concurrent but independent timing with another non-conflicting phase.

Type 8: Eight phase, fully actuated, solid-state, digitally timed with pedestrian timing and pedestrian timing and volume density for two artery and two cross street phases and dual maximum for each of four left turn phases. The identifying characteristic is a protected left turn phase on both artery approaches and both cross street approaches with any phase capable of concurrent but independent timing with another non-conflicting phase.

SECTION 7. SIGNAL HEAD

7.01 General:

- (1) This specification describes the minimum requirements for traffic signal heads and pedestrian signal heads and mounting hardware.
- (2) Signal Heads.

Vehicle and pedestrian signals complete with mounting devices as shown on the Plans and Design Standards shall be provided by the Contractor. Each signal face shall consist of one or more signal sections, designed and constructed so as to fit rigidly and securely together, one above the other to present a clean appearance and provide a weathertight enclosure for the optical and electrical equipment. These signal heads shall meet the requirements of the latest ITE Standards for "Adjustable Face Vehicle Traffic Control Signal Heads," the "Adjustable Face Pedestrian Signal Head Standard", and the NEC where applicable. Each signal head assembly shall be supplied complete with a traffic signal illuminating device of the required size and ready for operation with the connection of field wiring.

A. Materials.

The housing and door of each signal section shall be fabricated from corrosion-resistant U.V. stabilized Polycarbonate resin material. The moldings shall be a minimum of 0.090 inches thick and be ribbed for additional strength at point of high stress. Additional thickness shall be provided as necessary to eliminate light transmission through the housing, door, visor, or backplate.

Visors and backplates shall be fabricated from corrosion resistant U.V. stabilized Polycarbonate resin material. Visors shall have a 0.100-inch minimum thickness. Backplates shall have a 0.125-inch minimum thickness.

7.02 Housing:

(1) The housing of each section shall be a one-piece, corrosion-resistant, Polycarbonate resin molding with integral blow holes. Each vehicle signal shall be furnished with provisions for mounting of a backplate. The top and bottom of the housing shall have an opening 2 inches in diameter to accommodate standard 1/2-inch pipe, with no other opening in the top or bottom of the housing. Individual signal sections shall be fastened together, one above the other into a complete signal face, by means of plated nuts, bolts, and washers in such a manner that any section may be rotated about a vertical axis and positioned at an angle with respect to an adjacent section. The opening hub shall have 72 circumferential serrations to secure each section in its orientation adjustable in 5-degree increments, and prevent its inadvertent rotation. A six-position labeled barrier terminal block shall be provided in each signal face for the purpose of field connections. The barrier terminal shall be installed in the circular yellow or yellow arrow section of each signal face. If the face has neither of these sections, the terminal block shall be installed in the uppermost section of the head. There shall be provisions for the attachment of a 1/4 inch tether line to the bottom of each span wire-mounted signal head as shown in the Design Standards. A pinnacle shall be provided to close all 2-inch openings in each housing which will not otherwise be sealed from the weather when installed with the specific mounting hardware.

(2) The housing door of each signal section shall be a one-piece, corrosion-resistant Polycarbonate resin molding free of voids, cracks, inclusions, or blow holes. The outer face of the door shall have four (4) holes equally spaced about the circumference of the lens opening to accommodate the secure mounting of the signal head visor. Two stainless-steel hinge pins shall attach the door to the housing, one in the upper left corner and one in the lower left corner of the door. Two stainless-steel wing nuts or screws, one in the upper right corner and one in the lower right corner of the door, shall be used for opening the door and closing it tight against the housing. The wing screws or nuts shall be installed to prevent their accidental removal or falling out. The removal of the hinge pins and the operation of the wing nuts or screws shall not require the use of tools.

(3) Mounting Hardware.

Spanwire suspension fitting with cable entrance shall be one-piece malleable iron casting, minimum wall thickness 3/16 inch, and free of flash and voids. The cable entrance shall have a plastic bushing with a minimum inside diameter of 1-1/4 inches. The suspension fitting shall provide six separate, clevis pin positions for balancing the signal assembly. The thickness of the solid casting in this suspension area shall be a minimum of 5/8 inch. A hex head threaded malleable iron lock nipple shall be provided for attaching the signal head to the bottom of the suspension fitting for one-face signals or to the top bracket of multiface signal brackets.

The mounting hardware for each signal face shall include a nylon, serrated, 72-tooth lock ring with full locking pins and a circular neoprene gasket for weather sealing.

All openings in signal heads and bracketry which are not otherwise utilized for a signal mounting shall be closed with a hex ornamental pinnacle assemble complete with circular neoprene gasket and malleable iron hex lock nut. No conduit lock nuts are permitted.

The Spanwire Suspension Clamp Assembly, where required, shall consist of a galvanized, malleable iron spanwire clevis saddle, 5/8 inch diameter plated steel clevis pin with cotter key, two 1/2 inch plated steel "U" bolts with nuts and washers (no "J" bolts are permitted), and a galvanized malleable iron cable locking bar - all fitted for 5/15 inch guy span. Galvanizing shall conform to ASTM A 153.

The Balance Adjustor required for each spanwire suspended signal head shall be supplied with a malleable iron balance adjustor complete with steel I-bolt and steel clevis pin with cotter key to be installed between the spanwire suspension clamp and the suspension fitting with cable entrance.

Brackets, where required, shall consist of a malleable iron center outlet body, schedule 40 pipe, elbows, serrated fittings, and other hardware as required to provide a multiface signal head assembly with internal wiring raceways to each face as specified.

The Spanwire Bottom Bracket, where required, shall consist of 2-5/8" x 1/8" steel brace with an arm fitted with a pinnacle, neoprene washer, and malleable iron hex lock nut for each signal face to be accommodated (conduit lock nuts are not acceptable). An attachment fitting for 1/4 inch tether wire shall be mounted at the center of the bracket as shown in the Design Standards.

The Polycarbonate Side of Pole Bracket, where required, shall be one-piece molding with internal wiring raceway for banding or lag screw attachment to steel or wood poles. Brackets shall be designed to withstand 100 mph wind loading on it and the signal head. Each bracket shall have an integrally molded 72-tooth serrated ring for signal head positioning and come complete with 1-1/2 inch nipple, hex lock nut, pinnacle, neoprene washer, and one 1/4 inch interlock shim for plumbing signals.

The Elevator Plumbizer, where required, shall be malleable iron or bronze alloy for mast arm installations, with internal wire raceway, sized to fit a 1-1/2 tennon, complete with three screws and one through bolt with nuts and lock washer, complete with serrations to lock signal position - to be installed between the red and yellow sections.

The Slip Fitter Collar, where required, for top post mounting shall be malleable iron, including one vertical 1-1/2 inch nipple with hex lock nut: two 1-1/2 inch threaded horizontal entrances; and three set screws for attachment to the post. All horizontal entrances not used for attaching signal brackets shall be closed with pinnacle and neoprene washer.

7.03 Optical System

1. Displays – All signal displays shall be of the LED-type meeting the requirements set forth in Section 11.
2. Visors - Each signal shall be fitted with a corrosion-resistant Polycarbonate resin tunnel visor. Eight-inch signals shall have visors a minimum of 7 inches long; 12-inch signals shall have visors a minimum of 9-1/2 inches long. The visors shall be flat black inside and outside. The visors shall be securely attached to the door at four locations equally spaced about the circumference of the lens opening with four plated screws or four bayonet-type self locking tabs integrally formed with the visor. The visor shall fit flush against the door, and no light shall leak between the door and the visor. The visor shall be preformed into a fixed cylindrical shape of the proper diameter to be installed around the lens.

3. Backplate. - Each vehicle signal head assembly, so required by the Plans, shall be equipped with a backplate with a minimum width of 5 inches with rounded corners. Stainless-steel screws shall be provided for mounting to the signal housing. The backplate shall consist of one or more pieces fabricated from corrosion-resistant, flat Polycarbonate resin material colored flat black on the front and back.

7.04 Color, Finish, and Painting.

Polycarbonate resin hardware shall have color impregnated throughout the material. The finish shall be smooth and unflawed. Signal head parts shall be colored as follows:

1. Vehicle Head:

Housing - Federal Yellow
Door - Flat Black
Tunnel Visor - Flat Black inside and out
Backplate - Flat Black front and back
Pole Bracket - Federal Yellow

2. Pedestrian Head:

Housing -Federal Yellow
Door - Black
Tunnel Visor - Flat Black inside and out
Pole Bracket - Federal Yellow

All metal hardware, except those specified as galvanized, plated, or stainless steel shall be painted Federal Yellow. The metal parts shall be painted with a primer coat and a finish coat of oven-baked enamel meeting the requirements of this Specification. Lenses, reflectors, gaskets, and Polycarbonate parts shall not be painted.

- 7.05 Until such time as the Department has made final acceptance, fixture heads shall remain concealed from view of approaching traffic by means of heavy, opaque plastic or canvas cloths, draped over and securely attached to heads.

SECTION 8. VIDEO DETECTION SYSTEM AND PEDESTRIAN DETECTION

8.01 General

- (1) Vehicular traffic detection shall utilize video detection technology at all locations unless otherwise noted in the Plans.
- (2) Contractor shall provide video detection system that meets all specifications for the Iteris Vantage video detection system.

8.02 Materials and Equipment

The Contractor shall provide all equipment and materials to provide for a fully-functional video detection system, including the following:

- (1) A video processing unit capable of accommodating all cameras located at the intersection.
- (2) All cameras as indicated in the Plans.
- (3) Camera mounts, including arms, brackets, fittings, and other items needed to properly secure camera to poles or mast-arms.
- (4) A grayscale ("black & white") video monitor having a 12" minimum nominal diagonal screen size. Monitor shall have external power switch and controls for horizontal and vertical hold, brightness, and contrast.

- (5) A two-button mouse with mousepad for use in setting detection zones.
- (6) All cables needed to properly power the system and deliver the camera feed to the video processing unit and detection calls to the signal controller.

8.03 Pedestrian Push Button Detectors

The Pedestrian Push Button Assembly for use with the controllers shall be actuated by the pushing of a 2-inch diameter, round, aluminum spring return button which shall cause the closure of a set of internal contacts. The push button / contact assembly shall be screwed into a one-piece, Federal Yellow painted aluminum die cast, cylindrical housing suitable for mounting on a steel pole in conformance with the Plans. The push-button assembly shall be constructed and gasketed to prevent accidental shock and provide weatherproof and freezeproof operation

SECTION 9. PULL BOXES

9.01 General:

Pull boxes shall be installed at locations shown on plans or where directed by the Engineer. Additional pull boxes may be required where conduit runs are more than 150 feet long. Covers shall be flush with the curb or sidewalk grade or with the surrounding ground as required. No pull boxes shall be placed in the roadway area.

9.02 Materials:

A. Traffic Pull Boxes

- 1. Pull boxes shall be constructed of concrete (5000) psi) reinforced in accordance with the details as shown in the Plan. Reinforcement shall consist of steel wire fabric, 4" x 4" - No. 4/4 @ 85 lb./100 square feet, meeting the requirements of Article 907.03 of the Tennessee Standard Specifications for Road and Bridge Construction.
- 2. The cover shall have roughened top surface. Notches shall be provided for removing the cover. The words "Traffic Signal" shall be inscribed on top of the cover with letters 2 inches high and 1/8 inch in relief as indicated on the Plans.

B. Fiber Optic Pull Boxes

- 1. Pull boxes shall be Quazite™ brand or approved equipment, provided in the sizes indicated in the plans. The cover shall have roughened surface with the words "TRAFFIC SIGNAL" inscribed on the top of the cover. The cover shall be secured to the body of the box with bolts.

9.03 Installation:

- 1. Pre-cast pull boxes shall be shipped to the job site only after approval is obtained from the Engineer.
- 2. The excavation shall be maintained as closely as possible to the prescribed size of the box.
- 3. Fill material for drainage shall be coarse aggregate, as defined by Section 710.05 and 903.7 of the Tennessee Standard Specifications for Road and Bridge Construction. The box shall be set level, and the exposed surface shall conform to surrounding grade. Area around pull boxes shall be cleared of all excess dirt, lumber, asphalt, concrete, etc., following installation and acceptance of pull boxes. Pull boxes shall be installed with their longer side parallel to the adjacent curb line.
- 4. The bottom of the pull box shall be set firmly on a bed of crushed stone with a minimum depth of 12 inches below the bottom and extending 6 inches beyond the outside edge of the pull box, unless otherwise specified by the Engineer.

5. Electrical conductors shall be placed within pull boxes in such a manner as to be clear of any metal frame and the cover.
6. Ground rods shall be placed in the pull boxes where required in accordance with the plans and design standards.

SECTION 10. SIGN AND SIGNAL SUPPORTS, AND POLE FOUNDATIONS

10.1 General:

1. These Specifications apply to poles for the support of traffic signals and signs to be used in Shelby County. The height of poles, shaft dimensions, and wall thickness shall meet the design requirements and mounting height of traffic signals and signs as set forth in these Specifications and on the Plans.
2. The pole shall be fabricated from best, hot-rolled basic open hearth steel and shall have only one longitudinal electrically welded joint and no intermediate horizontal welds or joints. The shaft shall be longitudinally cold-rolled to flatten the weld and increase the physical characteristics so that the metal will have a minimum yield strength of 55,000 psi.
3. The steel poles covered under these specifications shall be tapered, upright circular steel with a uniformly tapered shaft and a round cross section. These poles shall be processed to a minimum yield stress of 55,000 psi. The pole wall thickness (gauge) and other specification data in Table 9 and elsewhere in this specification shall relate to the characteristics of the completed pole after fabrication. Steel sign and signal poles shall have a section modulus equal to or exceeding those in Table 9.
4. The materials used shall meet or exceed the standards of American Society of Testing and Materials and the Society of Automotive Engineers, as noted, and such standards shall be made a part of this specification. Poles shall be galvanized inside and outside to ASTM A-123.
5. All welding shall be performed by welders qualified in accordance with "American Welding Society Standard Specifications for Welded Highway and Railway Bridges." All welding shall be performed in the positions using the electrodes and procedures permitted under the qualification techniques.
6. All steel and cast iron components, hardware and threaded fasteners, except anchor bolts, shall be galvanized after fabrication in accordance with ASTM Designations A-123, A-153 or A-385, as applicable.

TABLE 9

MINIMUM SECTION MODULUS FOR STEEL POLES

(Inches)

<u>Location</u>	<u>12-Inch Base Diameter</u>			<u>13-Inch Base Diameter</u>		
	<u>#0 Gauge</u>	<u>#3 Gauge</u>	<u>#7 Gauge</u>	<u>#0 Gauge</u>	<u>#3 Gauge</u>	<u>#7 Gauge</u>
Base	32.6	26.5	19.3	38.5	31.3	22.8
20'	29.3	15.3	11.2	23.2	18.9	13.8
24'	16.4	13.4	9.8	20.6	16.8	12.3
28'	14.2	11.6	8.5	18.2	14.8	10.9

30'	13.2	10.8	7.9	17.0	13.9	10.2
32'	12.2	10.0	7.4	15.9	13.0	9.6

10.2 Strain Poles:

(1) Strain poles shall be galvanized steel with a uniformly tapered shaft. All poles shall be complete with a removable cast aluminum top cover with stainless steel set screws for fastening cover to top of pole. A "J" hook wire support shall be located inside the pole near the top, and four 2-inch threaded pipe couplings shall be located on the outside near the top of the pole. Two "U" bolt spanwire clamps shall be furnished complete for each pole. The threaded bolt shall be 5/8-inch in diameter and shall be furnished with galvanized hexagon nuts. The clamps shall be sized to fit each tapered pole at a point 18 inches from the top. A 4-inch by 8-inch curved handhole with 11-gauge galvanized steel cover shall be installed 18 inches above the base of anchor base poles. The handhole opening in the pole shall be fitted with a steel frame welded into place. The cover shall be furnished with two (2) 1/4-inch stainless steel installation screws and a No. 35 stainless steel chain to leash the cover at the handhole. The handhole shall be oriented on the pole so that it is centered between two adjacent anchor bolt holes in the base. A ground lug for No. 6 AWG ground wire shall be provided inside each pole and accessible from the handhole. The pole and all of its component parts shall be designed to support traffic signals or signs of the type and number indicated on the plans, suspended from a spanwire assembly. The shaft shall be fabricated from material providing a minimum yield strength of 55,000 psi after fabrication.

(2) Unless otherwise specified, all strain pole traffic signal or sign supports shall be anchor base poles designed for installation on concrete foundations. The base shall be fabricated from drop-forged or cast steel of sufficient cross section to fully develop the ultimate strength of the poles. The base shall be fastened to the pole by means of a welded connection and shall develop full strength of the pole. The base shall be provided with four holes of sufficient size to accommodate the proper size anchor bolts that are capable of resisting (at yield stress) the bending moment of the shaft at its yield strength stress. Four removable cast iron covers for the anchor bolts shall be provided with stainless steel attaching screws.

(3) The pole and all of its component parts shall be designed to support traffic signals or signs of the type and number indicated on the Plans, suspended from a spanwire assembly. The shaft shall be fabricated from material providing a minimum yield strength of 55,000 psi after fabrication.

(4) Plumbing of standards, posts, and pedestals shall be accomplished by adjusting the nuts. Shims or similar devices for plumbing or raking will not be permitted. After plumbing or raking has been completed, anchor bolts will be cut off 1/4 inch above the top nut and the exposed surface painted with rust protective paint. Caps shall be placed over the nuts and a cement grout placed under the pole with a weep hole - all as shown in the Plans.

10.3 Foundations:

(1) Foundations for posts, standards, and pedestals shall be Class A portland cement concrete per Special Provisions herein. Anchor bolts, conduits, and reinforcing steel shall be placed in accordance with the Plans and design standards.

(2) Foundations for posts, standards, and pedestals shall be poured monolithically to final grade. The exposed portions shall be formed and finished to present a neat appearance. The bottom of concrete foundations shall rest on firm, undisturbed ground. A vibrator shall be used in the pouring of all foundations to remove voids and air entrapment.

(3) Forms shall be true to line and grade. Tops of foundations for posts and standards, except special foundations, shall be finished at sidewalk grade or as ordered by the Engineer. The tops of foundations shall be 6 inches deep and square, with the dimension equal to the diameter of the foundation. A 1-inch joint material shall be placed around the 6-inch top square. Forms shall be rigid and securely braced in place. Conduit ends and anchor bolts shall be placed in proper position and to proper height and shall be held in place by means of a template until the concrete sets. Calcium chloride may not be used to speed the setting of the concrete. Conduit entries in addition to those required for installation shall be placed in each foundation, oriented as shown on the plans or as directed by the Engineer, and capped according to these Specifications.

(4) Both forms and ground that will be in contact with the concrete shall be thoroughly moistened before placing concrete. Forms shall not be removed until the concrete has thoroughly cured for at least 12 hours and hardened sufficiently to allow form to be removed with causing damage to the concrete. No pole shall be installed until eight (8) days after the foundation has been poured.

(5) Ordinary surface finish shall be applied to exposed surfaces of concrete. Wherever the edge of a concrete foundation or sidewalk section is within 18 inches of any existing concrete improvement, the sidewalk section shall be extended to meet said existing improvements.

(6) Where obstructions prevent construction of planned foundations, the Contractor shall construct a foundation satisfactory to the Engineer.

10.4 Anchor Bolts:

(1) High strength steel anchor bolts, each fitted with one regular hex nut and one heavy duty square nut, shall be furnished with anchor-base type of poles. All nuts and not less than 10 inches of the threaded ends of anchor bolts shall be hot-dipped galvanized in accordance with ASTM Designation A153. The anchor bolts shall have a minimum yield strength of 55,000 p.s.i. and a minimum ultimate strength of 90,000 p.s.i. each. The anchor bolts shall be capable of resisting (at yield strength stress) the bending moment of the shaft at its yield strength stress.

(2) Anchor bolts and nuts required for relocating existing standards and posts shall be furnished by the Contractor.

10.5 Mill Test Reports and Certification:

Mill Test Reports and Certifications of Specifications for Materials and Design will be required for all materials incorporated into the work. The following shall be supplied by the Contractor prior to acceptance of the materials:

- a. "Mill Test Reports" (M.T.R.) for MAJOR structural items only, as noted in Table 2701-10, shall include both physical and chemical descriptions of the materials as supplied to the fabricator. When physical properties are altered during the fabrication, M.T.R. covering chemical composition will be supplemented by certified test reports indicating the physical properties of this material after fabrication.
- b. Certification of conformance to the Specifications for all remaining material not covered by M.T.R. as noted in Table 10.
- c. Certification that all welding was performed by operators qualified as follows: Steel welders to AWS and aluminum welders to ASME.
- d. Certification of conformance to Specification for the design of all components not completely dimensioned and detailed in the Design Standards.

TABLE 10

MILL TEST REPORT AND CERTIFICATION OF CONFORMANCE REQUIREMENTS

Component Materials	M.T.R.	Certification
Tubes for arms and poles	X	
Base castings	X	
Anchor Bolts	X	
Pole tops miscellaneous fittings and hardware		X
Fabricated or cast type arm connections		X
Galvanizing		X
Signal cable and wire		X
Loop Sealant		X
Concrete	X	

SECTION 11. LIGHT EMITTING DIODE (LED) MODULES

11.01. TRAFFIC SIGNAL

- (1) PURPOSE - This specification provides the minimum performance requirements for 300 mm (12 in) and 200 mm (8 in) LED traffic signal modules. It is not intended to impose restrictions upon specific designs and materials that conform to the purpose and the intent of this specification. This specification refers to definitions and practices described in "Vehicle Traffic Control Signal Heads" published in the *Equipment and Materials Standards of the Institute of Transportation Engineers*, referred to in this document as "VTCSH". The multiple LED light source should be the latest technology available on the market. The LEDs utilized shall be AlInGaP technology for red, and yellow indications, or InGaN technology for green indications. LEDs shall be the ultra bright type rated for 100,000 hours of continuous operation from -40C to +74C.

(2) PHYSICAL AND MECHANICAL REQUIREMENTS

2.1 LED Signal Module

2.2.1 Tinting - The lens shall be tinted or colored to match the wavelength (chromaticity) of the LED as long as the luminous intensity still conforms to ITE table 1.

2.2.2 The LED module shall be constructed to allow the replacement of the outer lens and/or the light engine as needed.

2.2 Environmental Requirements

2.2.1 The LED module shall be rated for use in the ambient operating temperature range of -40°C (-40°F) to +74°C (+165°F).

2.2.2 The LED module shall be protected against dust and moisture intrusion as per NEMA Standard 250-1991 requirements, for Type 4 enclosures to protect all internal LED, electronic, and electrical components.

2.2.3 The LED signal module lens shall be UV stabilized.

2.2.4 The lens shall be smooth on the outside to prevent excessive dirt/dust buildup, and be specifically designed to reduce sun reflections (Sun Phantom).

2.2.5 The LED module must be supplied with an installed gasket.

2.3 Construction

2.3.1 The LED module shall be a single, self-contained device, not requiring on-site assembly for installation into an existing traffic signal housing. The power supply must fit and mount inside the LED module.

2.3.2 The assembly and manufacturing process for the LED assembly shall be designed to assure all internal LED and electronic components are adequately supported to withstand mechanical shock and vibration from high winds and other sources.

2.4 Materials

2.4.1 Materials used for the lens and LED module construction shall conform to ASTM specifications where applicable.

2.4.2 Enclosures containing the power supply and electronic components of the LED module shall be made of UL94VO flame retardant materials. The lens of the LED module is excluded from this

requirement.

2.5 Module Identification

2.5.1 Each LED module shall be identified on the backside with the manufacturer's name and serial number.

2.5.2 The following operating characteristics shall be identified: nominal operating voltage, power consumption, and Volt-Ampere.

2.5.3 LED modules shall have a prominent and permanent vertical indexing indicator, i.e., UP ARROW or the word UP or TOP, for correct indexing and orientation inside a signal housing.

(3) PHOTOMETRIC REQUIREMENTS

3.1 Luminous Intensity & Distribution

3.1.1 The maintained minimum luminous intensity values for red, yellow, and green LED modules throughout the warranty period, under the operating conditions defined in Sections 2.3.1, 4.2.1 and 5.4.2, and at the end of the warranty period, shall not be less than the values shown in Table 1 & 2, and are required to meet initial luminous values that are 115 percent of the required minimum values in the specification (Table 1 & Table 2).

3.1.2 When operating within the temperature range specified in Section 2.3.1 during the warranty period, the maximum luminous intensity for the 8-inch or 12-inch signals shall not exceed 800 candelas for the Red, 1,600 candelas for the Green, and 1,600 candelas for the Yellow.

3.1.3 The optical lens should reflect a light distribution look similar to that of an incandescent lamp with expanded view for special applications. To ensure even illumination 12" LED full ball modules shall consist of a minimum of 100 InGaP (green) or AlInGaP (red and amber) LEDs.

3.1.4 The LED arrow module shall have a full, filled profile, reflecting a light distribution look and appearance similar to that of an incandescent lamp, without the individual LED's being visible. The arrows shall meet all Caltrans specifications on light intensity.

3.2 Chromaticity - The measured chromaticity coordinates of LED modules shall be between 500 nm and 650 nm, conforming to the chromaticity requirements of Section 8.04 and Figure 1 of the VTCSH standard.

Table 1. Maintained Minimum Luminous Intensity for 12" Expanded View LED Signal Modules
Candlepower Values (candelas (cd))

Vertical Angle	Horizontal Angle (Left & right)	12-inch Signal		
		Red	Yellow	Green
17.5 up	17.5°	3	7	7
	2.5 °	10	20	20
12.5 up	17.5°	14	27	27
	2.5 °	20	41	41
7.5 up	17.5°	20	41	41
	2.5 °	54	108	108
2.5 up	17.5°	58	115	115
	2.5 °	220	441	441
-2.5 down	2.5°	339	678	678
	7.5 °	251	501	501
	12.5 °	141	283	283
	17.5 °	77	154	154
-7.5 down	2.5 °	226	452	452
	7.5 °	202	404	404
	12.5 °	145	291	291
	17.5 °	89	178	178
	22.5 °	38	77	77
	27.5 °	16	32	32
-12.5 down	2.5 °	50	101	101
	7.5 °	48	97	97
	12.5 °	44	89	89
	17.5 °	34	69	69
	22.5 °	22	44	44
	27.5 °	16	32	32
-17.5 down	2.5 °	22	44	44
	7.5 °	22	44	44
	12.5 °	22	44	44
	17.5 °	22	44	44
	22.5 °	20	41	41
	27.5 °	16	32	32
-22.5 down	2.5 °	10	20	20
	7.5 °	7	14	14

Table 2. Maintained Minimum Luminous Intensity for 8-inch LED Signal Modules Candlepower Values (candelas (cd))

Vertical Angle Down	Horiz. Angle Left & Right	8-inch Signal		
		Red	Yellow	Green
2.5°	2.5°	133	267	267
	7.5°	97	194	194
	12.5°	57	113	113
	17.5°	25	48	48
7.5°	2.5°	101	202	202
	7.5°	89	178	178
	12.5°	65	129	129
	17.5°	41	81	81
	22.5°	18	37	37
	27.5°	10	20	20
12.5°	2.5°	37	73	73
	7.5°	32	65	65
	12.5°	28	57	57
	17.5°	20	41	41
	22.5°	12	25	25
	27.5°	9	16	16
17.5°	2.5°	16	32	32
	7.5°	14	28	28
	12.5°	10	20	20
	17.5°	9	16	16
	22.5°	6	12	12
	27.5°	4	9	9

(4) ELECTRICAL

4.1 General - All wiring and terminal blocks shall meet the requirements of Section 13.02 of the VTCSH Standard. Two secured, color coded, 914 mm (36 in) long 600 V, 20 AWG minimum, jacketed wires, conforming to the National Electrical Code, rated for service at +105°C, are to be provided for electrical connection.

4.2 Voltage Range

4.2.1 LED modules shall operate from a 60 ± 3 cycle ac line power over a voltage range from 80 Vac rms to 135Vac rms. The current draw shall be sufficient to ensure compatibility and proper triggering and operation of load current switches and conflict monitors in the signal controller that the procuring traffic authority customer has in use.

4.2.2 Nominal operating voltage for all measurements shall be 120 ± 3 Volts rms.

4.2.3 Fluctuations in line voltage over the range of 80Vac to 135Vac shall not affect luminous intensity by more than ± 10 percent.

4.2.4 The LED circuitry shall prevent flickering at less than 100 Hz over the voltage range specified in Section 4.2.1.

4.2.5 Low Voltage Turn Off - There shall be no illumination from the module when the applied voltage is less than 45 volts AC. To test for this condition the unit must first be fully illuminated at the nominal operating voltage. The applied voltage is then reduced to the point that there is no illumination. This point must be greater than 45 volts AC. The same requirement should apply in rising voltage from 0 to 45 with no visible illumination.

4.2.6 Turn-On and Turn-Off Time:

The modules shall reach 90% of their full illumination (turn-on) within 100 msec (+ or - 10%) after the application of the nominal operating voltage. The LED modules shall not be illuminated (turn-off) within 100 msec (+ or - 10%) after the removal of the nominal operating voltage.

4.3 Transient Voltage Protection

4.3.1 The LED module on-board circuitry shall include voltage surge protection to withstand high-repetition noise transients and low-repetition, high-energy transients as stated in Section 2.1.6, NEMA Standard TS-2, 1992.

4.4 LED Drive Circuitry

4.4.1 The individual LED light sources shall be wired so that the catastrophic failure of one LED will result in the loss of the light from only that one LED.

4.4.2 The power supply must be current regulated.

4.5 Electronic Noise - The LED module and the associated on-board circuitry must meet Federal Communications Commission (FCC) Title 47, SubPart B, Section 15 regulations concerning the emission of electronic noise.

4.6 Power Factor and AC Harmonics

4.6.1 LED modules shall provide a power factor of 0.90 or greater when operated at nominal operating voltage, and 25°C (77°F).

4.6.2 Total harmonic distortion induced into an ac power line by an LED signal module, operated at nominal operating voltage, at 25°C (77°F) shall not exceed 20 percent.

(5) QUALITY ASSURANCE

5.1 General

5.1.1 Quality Assurance Program - LED modules shall be manufactured in accordance with a vendor quality assurance (QA) program. The QA program shall include two types of quality assurance: (1) design quality assurance, and (2) production quality assurance. The production quality assurance shall include statistically controlled routine tests to ensure minimum performance levels of LED modules built to meet this specification.

5.1.2 Record Keeping - QA process and test result documentation shall be kept on file for a minimum period of seven years.

5.1.3 Conformance - LED module designs not satisfying design qualification testing and the production quality assurance testing performance requirements in Sections 5.3 and 5.4 shall not be labeled, advertised, or sold as conforming to this specification.

5.2 Manufacturers' Serial Numbers - Each LED module shall be identified by a manufacturer's serial number for warranty purposes.

5.3 Production Quality Assurance (QA) Testing - All new LED modules shall undergo the following Production Quality Assurance testing prior to shipment. Failure of any LED module to meet requirements of these QA tests shall be cause for rejection. QA test results shall be maintained per the requirement of Section 5.1.2.

5.3.1 Module Burn-in - All LED modules or the electronic circuitry sub-assemblies, including all LEDs, shall be energized for a minimum of 24 hours, at 100 percent on-time duty cycle, in an ambient temperature of 60°C (+140°F).

5.3.2 Maintained Minimum Luminous Intensity - All LED modules shall be tested for maintained minimum luminous intensity after burn-in. A single point measurement with a correlation to the intensity requirements of Table 1 in Section 3.0 may be used. The LED module shall be operated at nominal operating voltage and at an ambient temperature of 25°C (77°F).

5.3.3. Power Factor - All LED modules shall be tested for power factor after burn-in per the requirements of Section 4.6.1. A commercially available power factor meter may be used to perform this measurement.

5.3.4 Current - All LED modules shall be measured for current flow in Amperes after burn-in. The measured current values shall be compared against current values resulting from design qualification measurements in Section 5.4.4.1. Measured current values in excess of 120 percent of the design qualification current values shall be cause for rejection.

5.3.5 Visual Inspection - All LED modules shall be visually inspected for any exterior physical damage or assembly anomalies.

5.4 Design Qualification Testing

Design qualification testing shall be performed on new LED module designs, and when a major design change has been implemented on an existing design. The minimum sample quantity of LED modules shall be as stated for each test. Failure to meet requirements of any of these tests shall be cause for rejection.

Testing shall be performed once every 5 years or when the module design or LED technology has been changed. Test data shall be retained by the testing laboratory and the LED module manufacturer for a minimum period of 5 years.

5.4.1 Burn-in - LED modules shall be energized for a minimum of 24 hours, at 100 percent on-time duty cycle, in an ambient temperature of +60°C (+140°F) before performing any design qualification testing.

5.4.2 Maintained Minimum Luminous Intensity

5.4.2.1 After burn-in, a random sample of six LED modules shall be tested for maintained minimum luminous intensity at each of the 44 points indicated in Table 1, Section 3.0. These measurements shall be recorded at an ambient temperature of 25°C after the signal has been operated for 60 min.

5.4.2.2 After burn-in, a random sample of six LED modules shall be tested for maintained minimum luminous intensity. Signals to be tested shall be mounted in a temperature testing chamber so that the lens portion of the signal is outside the chamber and all portions behind the lens are within the chamber at a temperature of 74°C (165°F). The air temperature in front of the signal lens shall be maintained at a minimum of 49°C (120°F) during all tests.

Red and green LED modules shall be tested for luminous output at 74°C (165°F), allowing the modules to achieve thermal equilibrium for 60 minutes, while the modules are energized at nominal operating voltage, at a 100% duty cycle, a single luminous intensity measurement shall be recorded.

Yellow LED modules shall be tested for luminous output at 25°C (77°F), allowing the modules to achieve thermal equilibrium for 60 minutes, while the modules are energized at nominal operating voltage, at a 8.3% (or 1/12) duty cycle or 5 sec On/55 sec Off.

A single point correlation measurement, accounting for measurement variables, shall be made at 25°C (77°F). For Red and green a measurement shall be made at 74°C (165°F) (lens at 49°C (120°F)). The 74°C measurement factored to the 25°C measurement shall be able to be correlated to the requirements of Table 1, Section 3.0. LED modules not meeting this correlation

shall be cause for rejection.

5.4.3 Chromaticity - A sample of two LED modules shall be measured for chromaticity per the requirements of Section 3.4.2. A spectroradiometer shall be used for this measurement. The ambient temperature for this measurement shall be +25°C (+77°F).

5.4.4 Electrical

5.4.4.1 Current. - A sample of six LED modules shall be measured for current flow in Amperes. The measured current values shall be used for quality comparison of Production Quality Assurance current measurements on production modules.

5.4.4.2 Power Factor - A sample of six LED modules shall be measured for power factor per the requirements of Section 4.6.1. A commercially available power factor meter may be used to perform this measurement.

5.4.4.3 Total Harmonic Distortion (THD). A sample of six LED modules shall be measured for total harmonic distortion per the requirements of Section 4.6.2. A commercially available total harmonic distortion meter may be used to perform this measurement.

5.4.4.4 Electronic Noise. A sample of one LED module shall be tested per the requirements of Section 4.6, with reference to Class A emission limits referenced in Federal Communications Commission (FCC) Title 47, SubPart B, Section 15.

5.4.4.5 Controller Assembly Compatibility. Due to the low load current draw and high off-state impedance of LED modules, the following design qualification tests shall be performed to ensure the module design is compatible and operates properly with load current switches and conflict monitors in NEMA and Type 170 traffic signal control units.

5.4.4.5.1 Load Switch Compatibility. A sample of six LED modules shall be tested for compatibility and proper operation with load current switches. Each LED module shall be connected to a variable AC voltage supply. The AC line current into the LED module shall be monitored for sufficient current draw to ensure proper load switch operation while the voltage is varied from 80 V rms to 135 V rms. Failure of the current draw to ensure proper load current switch operation shall be cause for rejection.

5.4.4.5.2 Signal Conflict Monitor Compatibility. A sample of six LED modules shall be tested for compatibility and proper operation with signal conflict monitors. Each LED module shall be operated from a 135 V ac voltage supply. A 19.5 k@resistor shall be wired in series in the hot line between the LED module monitor and the ac power supply. A single-pole-single-throw switch shall be wired in parallel across the 19.5 k@resistor. A 220 k@shunt resistor shall be wired between the hot line connection and the neutral line connection and the neutral line connection on the LED module. Conflict monitor compatibility shall be tested by measuring the voltage decay across the 200 k@shunt resistor as follows: The single-pole-single-throw switch shall be closed, shorting out the 19.5 k@resistor, allowing the AC power supply to illuminate the LED module. Next, the switch shall be opened and the voltage across the 220 k@shunt resistor shall be measured for a decay to a value equal to or less than 10V rms within a time period equal to or less than 100 milliseconds. This test shall be repeated a sufficient number of times to ensure testing occurs at the peak of the AC line voltage cycle.

5.4.4.6 Nondestruct Transient Immunity. A sample of six LED modules shall be tested for transient immunity using the procedure described in Section 2.1.8, NEMA Standard TS 2-1992.

5.4.5 Environmental

5.4.5.1 Temperature Cycling. Temperature cycling shall be performed on a sample of three LED modules per MIL-STD-883, Test method 1010. The temperature range shall be per Section 2.3. A minimum of 20 cycles shall be performed with a 30-minute transfer time between temperature

extremes and a 30-minute dwell time at each temperature. LED modules under test shall be non-operating. Failure of a LED module to function properly or any evidence of cracking of the LED module lens or housing after temperature cycling shall be cause for rejection.

5.4.5.2 Moisture Resistance. Moisture resistance testing shall be performed on a sample of three LED modules per NEMA Standard 250-1991 requirements for Type 4 enclosures.

5.4.5.3 Mechanical Vibration - Mechanical vibration testing shall be performed on a sample of three LED modules per MIL-STD-883, Test Method 2007, using three 4-minute cycles along each x, y, and z axis, at a force of 2.5 Gs, with a frequency sweep from 2 Hz to 120 Hz. The loosening of the lens, of any internal components, or other physical damage shall be cause for rejection.

(6) WARRANTY

- 6.1 LED modules shall be replaced or repaired by the manufacturer if an LED module fails to function as intended due to workmanship or material defects within the first 60 months from the date of being put into field operation at no cost (including shipping) to the county.
- 6.2 LED modules which exhibit luminous intensities less than the minimum values specified in Table 1 Section 3.0 within the first 60 months of the date of being put into field operation, shall be replaced or repaired, at no cost (including shipping) to the county.
- 6.3 At the discretion of City of Memphis Traffic Signal Maintenance department, the City of Memphis shall yearly select up to 2% of the LED modules installed in the field from this purchase to be tested by the manufacturer for the current luminous intensity of each unit. Shipping to and from the manufacturer and actual costs of the tests will be borne by the manufacturer.

(7) SAMPLES - Sample modules representative of typical average production units, shall be provided for Traffic Engineering Division approval if requested. Samples will not be returned unless requested by the vender.

(8) DOCUMENTATION - Bidders shall be required to submit a copy of a test report certified by an independent laboratory (Intertek Testing Services ETL Semko) that the LED traffic signal lamp model submitted meets I.T.E. Standards for light distribution, chromaticity, and power (consumption, power factor and harmonic distortion) with the bid. In addition, the independent lab report shall specify the drive current being supplied to individual LED's within the unit. Designs that require LED's to be operated at currents greater than the LED manufacturer's recommended drive current will not be allowed.

(9) PRODUCT QUALIFICATION - All 12" balls and arrows bid shall have a total installed base in the United States, of a minimum of 25,000 lamps of each model and series number for one year prior to bid date.

(10) CONNECTED WATTAGE- Wattage and power savings are critical. The maximum acceptable wattage for the individual retrofits is listed below. Proposed LED retrofit modules, shall be less than or equal to the base wattage shown below.

Retrofit	Wattage
12" Red Ball	10 or less
12" Yellow Ball	22 or less
12" Green Ball	12 or less
12" Yellow Arrow	11 or less
12" Green Arrow	5 or less
8" Red Ball	5 or less
8" Yellow Ball	13 or less
8" Green Ball	6 or less

11.02. Pedestrian Signal

(1) PRODUCTS

- 1.1 General - Pedestrian LED traffic signal modules shall be designed as a retrofit replacement for the message bearing surface of a 12" x 12" pedestrian traffic signal housing built to the PTCSI Standard. The message-bearing surface of the module shall be supplied with "HAND" and "MAN" outline and overlapping symbols that comply with PTCSI standard for this symbol for a message-bearing surface of the size specified. This message-bearing surface shall be designed so that it can be removed from the sealed unit for replacement without further damage to the module.
- 1.2 Installation
 - 1.2.1. LED pedestrian signal modules shall be designed as retrofit replacements for the existing pedestrian signals.
 - 1.2.2 LED pedestrian signal modules shall not require special tools for installation.
 - 1.2.3 LED pedestrian signal modules shall fit into the existing traffic housings built to the VTCSH Standard without any modification to the housing.
 - 1.2.4 LED pedestrian signal modules shall be weather tight, fit securely in the housing and shall connect directly to existing electrical wiring.
 - 1.2.5 Installation of a replacement LED module into the existing pedestrian housing shall only require the removal of the existing optical unit components, i.e., lens, lamp, gaskets, and reflector.
 - 1.2.6 Each retrofit shall include all necessary components to complete conversion including an installed one-piece gasket.
 - 1.2.7 Each pedestrian module shall have a sticker attached stating compliance to the ITE Standard for color.
- 1.3 LED Signal Lens
 - 1.3.1 The lens of the LED pedestrian signal modules shall be polycarbonate UV stabilized and a minimum of $\frac{1}{8}$ " thick.
 - 1.3.2 The exterior of the lens of the LED pedestrian signal module shall be smooth and frosted to prevent sun phantom.
- 1.4 LED Pedestrian Signal Module Construction
 - 1.4.1 The LED pedestrian signal module shall be a single, self-contained device, not requiring on-site assembly for installation into the existing traffic signal housing.
 - 1.4.2 All Portland Orange or red LEDs shall be "AlInGaP" technology or equal, and rated for 100,000 hours or more at 25°C and 20 mA. "AlGaAs" technology is not acceptable. All white or green LED's shall be "InGaN" technology.
 - 1.4.3 All internal LED and electronic components shall be adequately supported to withstand mechanical shock and vibration from high winds and other sources.
 - 1.4.4 The signal module shall be made of UL94VO flame-retardant materials. The lens is excluded from this requirement.
 - 1.4.5 Each individual LED traffic module shall be identified for warranty purposes with the manufacturer's trade name, serial number and operating characteristics, i.e., rated voltage, power consumption, and volt-ampere.
- 1.5 Environmental Requirements

- 1.5.1 The LED pedestrian signal modules shall be rated for use in the ambient operating temperature range of -40°C to +60°C (-40°F to +140°F).
- 1.5.2 The LED pedestrian signal modules, when properly installed with gasket, shall be protected against dust and moisture intrusion per requirements of NEMA Standard 250-1991, sections 4.7.2.1 and 4.7.3.2, for type 4 enclosures to protect all internal LED, electronic, and electrical components.
- 1.6 Luminous Intensity
 - 1.6.1 Each module shall provide an average luminous of at least 3750 candela per square meter of lighting surface for the "HAND", and 5300 candela per square meter for the "WALKING PERSON" symbol throughout the warranty period over the operating temperature range.
 - 1.6.2 The luminous intensity of the LED pedestrian signal module shall not vary more than $\pm 10\%$ for voltage range of 80 VAC to 135 VAC.
- 1.7 Chromaticity - The measured chromaticity coordinates of the LED signal modules shall conform to the chromaticity requirements of Section 5.3 and Figure C of the PTCSI standard.
- 1.8 Electrical
 - 1.8.1 The secured, color coded, 914 mm (36 in) long, 600V, 20 AWG minimum, jacketed wires, conforming to the National Electrical Code, rated for service at +105°C, ½ inch stripped and tinned are to be provided for electrical connection.
 - 1.8.2 The LED pedestrian signal module shall operate from a 60 ± 3 Hz AC line over a voltage range of 80 VAC to 135 VAC. Rated voltage for all measurements shall be 120 ± 3 volts rms.
 - 1.8.3 The LED circuitry shall prevent perceptible flicker over the voltage range specified above.
 - 1.8.4 The LED pedestrian signal module circuitry shall include voltage surge protection against high-repetition noise transients and low-repetition noise transients as stated in Section 2.1.6, NEMA Standard TS-2, 1992.
 - 1.8.5 Catastrophic failure of one LED light source shall not result in the loss of more than the light from that one LED.
 - 1.8.6 The LED pedestrian module shall be operationally compatible with the currently used controller assemblies. The LED pedestrian module shall be operationally compatible with all conflict monitors.
 - 1.8.7 The LED pedestrian module including its circuitry must meet Federal Communications Commission (FCC) Title 47, Subpart B, Section 15 regulations concerning the emission of noise.
 - 1.8.8 The LED pedestrian module shall provide a power factor of .90 or greater over the operating voltage range and temperature range specified above for modules with 6 watts or more.
 - 1.8.9 Total harmonic distortion (current and voltage) induced into an AC power line by an LED pedestrian module shall not exceed 20% over the operating voltage range and temperature range specified above.
- (2) QUALITY ASSURANCE - LED pedestrian modules shall be manufactured in accordance with a Vendor quality assurance (QA) program including both design and production quality assurance. All QA process and test results documentation described below shall be kept on file for a minimum of seven years.

- 2.1 Production Quality Assurance - The following Production Quality Assurance tests shall be performed on each new LED signal module prior to shipment. Failure to meet requirements of any tests shall be cause for rejection.
- 2.1.1 Pedestrian Module Burn-In – All LED signal modules (or boards) shall be energized for a minimum of 24 hours, at 100 percent duty cycle, in an ambient temperature of 60°C (140°F).
 - 2.1.2 After burn-in, all LED pedestrian modules shall be tested for rated initial luminous intensity. Each module shall be energized at the rated voltage for a five-minute stabilization period before measurement is made. The ambient temperature for this measurement shall be the ambient operating temperature range of -40°C to +60°C (-40°F to +140°F).
 - 2.1.3 After burn-in, all LED pedestrian modules shall be tested for power factor and shall meet the requirements defined in this specification.
 - 2.1.4 After burn-in, all LED pedestrian modules shall be measured for current flow in amperes. The measured current values shall not exceed 110% of the design qualification measurements (described in the next section).
 - 2.1.5 All LED pedestrian modules shall be visually inspected for any exterior physical damage or assembly anomalies. Careful attention shall be paid to the surface of the lens to ensure there are no scratches, cracks, chips, discoloration, or other defects.
- 2.2 Design Qualification Testing - Design Qualification testing described below shall be completed documented and submitted with the equipment quotation. All Design Qualification testing shall be performed after a burn-in (module energized for a minimum of 24 hours, at 100 percent duty cycle, in an ambient temperature of +60°C (+140°F).
- 2.2.1 The LED pedestrian modules shall be measured for wattage by an independent testing laboratory.
 - 2.2.2 The LED pedestrian module shall be measured for chromaticity per the requirements defined in this specification using a spectrometer at an ambient temperature of +25°C (+77°F).
 - 2.2.3 The LED pedestrian modules shall be measured for power factor per the requirements defined in this specification by an independent testing laboratory.
 - 2.2.4 The LED modules shall be measured for total harmonic distortion per the requirements defined in this specification by an independent testing laboratory.
 - 2.2.5 The LED pedestrian modules shall be tested for electronic noise per the requirements defined in this specification with reference to Class A emission limits referenced FCC Title 47 Subpart B, Section 15 by an independent testing laboratory.
 - 2.2.6 The LED pedestrian modules shall be tested for transient immunity (e.g. early electronic component mortality failures, component reliability problems) using NEMA Standard TS 2-1992 by an independent testing laboratory.
 - 2.2.7 Mechanical vibration testing shall be performed on the LED pedestrian modules, by an independent testing laboratory, in accordance with MIL-STD-883, Test Method 2007, using three 4 minute cycles along each x, y, z axis, at a force of 2.5 Gs, with a frequency sweep from 2 Hz to 120 Hz. The loosening of the lens, of any internal components, or other physical damage shall be cause for rejection.
 - 2.2.8 Temperature cycling shall be performed on the LED pedestrian modules, by an independent testing laboratory, in accordance with MIL-STD-883, Test Method 1010. Using the temperature range of -40°C to +60°C (-40°F to +60°F), twenty cycles (minimum) with a thirty-minute transfer time between temperature extremes and with a thirty minute dwell time at each extreme shall be performed. Modules under test shall not be energized. Modules that fail to function properly or

show evidence of cracking of the lens or housing shall be rejected.

NOTE: With respect to design changes, if the construction of the modules has not been modified, documentation of testing described in items e, g, and h on older models is acceptable at time of bid.

(3) MANUFACTURER QUALIFICATIONS - Manufacturer/Distributor/Vendor must have experience with furnishing LED lighting for the installation of at least 5,000 LED traffic signals on any one project.

(4) WARRANTY

2.4.1 The unit shall be repaired or replaced by the contractor if it exhibits a failure due to workmanship or material defect within the first 60 months of delivery.

2.4.2 The unit shall be repaired or replaced if the intensity level falls below the requirements specified in 1-E part a, within 60 months of delivery.

(5) DOCUMENTATION - Bidders shall be required to submit a copy of a test report certified by an independent laboratory (Intertek Testing Services ETL Semko) that the LED traffic signal lamp model submitted meets I.T.E. Standards for light distribution, chromaticity, and power (consumption, power factor and harmonic distortion) with the bid. In addition, the independent lab report shall specify the drive current being supplied to individual LED's within the unit. Designs that require LED's to be operated at currents greater than the LED manufacturer's recommended drive current will not be allowed.

SECTION 12. FIBER OPTIC COMMUNICATIONS CABLE AND EQUIPMENT

(1) GENERAL

This work shall consist of furnishing, installing, and testing fiber optic cable in accordance with these Special Provisions and as shown on the Plans. The work includes all materials associated with the installation of fiber optic cable including distribution equipment, splicing, and fiber optic jumper cables.

Fiber optic cable, jumper cable, and distribution equipment shall be fabricated by a certified ISO 9001 manufacturer. All fiber optic cable provided under this Contract shall be from the same manufacturer utilizing identical specifications. All fiber optic cables shall be dielectric.

(2) MATERIALS

2.1 Fiber Optic Cable - Fiber optic cable shall contain single mode optical fibers, loose tube, filled with a water-blocking material, and shall be suitable for installation in underground conduit and field cabinets. Fiber optic cable shall comply with the requirements of RUS 1755.900 except as modified herein.

2.1.1 Optical Fiber Physical and Performance Requirements - All optical fiber in the cable shall, as a minimum, comply with the following requirements:

- Cladding diameter: $125 \pm 1.0 \mu\text{m}$
- Core-to-cladding offset: $\leq 0.8 \mu\text{m}$
- Cladding non-circularity: ≤ 1.0 percent
- Maximum attenuation: $\leq 0.35 \text{ dB/km}$ at 1310 nm; $\leq 0.25 \text{ dB/km}$ at 1550 nm
- Microbend attenuation (1 turn, 32 mm dia.): $\leq 0.5 \text{ dB}$ at 1550 nm
- Microbend attenuation (100 turns, 75 mm dia.): $\leq 0.05 \text{ dB}$ at 1310 nm
- Attenuation uniformity: no point discontinuity greater than 0.1 dB at either 1310 nm or 1550 nm
- Mode-field diameter (matched cladding): $9.3 \pm 0.5 \mu\text{m}$ at 1310 nm; $10.5 \pm 1.0 \mu\text{m}$ at 1550 nm
- Maximum chromatic dispersion: $\leq 3.2 \text{ ps/(nm} \times \text{km)}$ from 1285 nm to 1330 nm and $< 18 \text{ ps/(nm} \times \text{km)}$ at 1550 nm

- Fiber polarization mode dispersion: $\leq 0.5 \text{ ps}/(\text{km})^{1/2}$
- Fiber coating: dual layered, UV cured acrylate applied by the fiber manufacturer
- Coating diameter: $245 \mu\text{m} \pm 10 \mu\text{m}$
- Minimum storage temperature range: -40°F to $+158^{\circ}\text{F}$
- Minimum operating temperature range: -4°F to $+158^{\circ}\text{F}$

The change in attenuation for single-mode from -4°F to $+158^{\circ}\text{F}$ shall not exceed 0.2 dB/km at 1550 nm, with 80 percent of the measured values no greater than 0.1dB/km at 1550 nm.

2.1.2 Fiber Optic Cable Life Expectancy - The cable design shall achieve a life expectancy of 20 years when installed to manufacturer's specifications.

2.1.3 Buffer Tubes

Optical fibers shall be contained inside a loose buffer tube. Each buffer tube shall contain 6 fibers for cable sizes less than or equal to 36, larger cable sizes shall contain 12 fibers as shown on the Plans. The buffer tubes shall allow free movement of the fibers without fiber damage during installation or normal operation, including expansion and contraction of the buffer tubes. The diameter of all buffer tubes in a cable shall match.

Each buffer tube shall be filled with a non-hygroscopic, non-nutritive to fungus, electrically non-conductive, homogenous gel. The gel shall be free from dirt and foreign matter. The gel shall be readily removable with conventional nontoxic solvents.

2.1.4 Stranding - Buffer tubes shall be stranded around a central member using the reverse oscillation, or "S-Z", stranding process. When less than 5 buffer tubes are required in the loose tube cable, filler rods shall be included in the cable core to lend symmetry to the cable cross-section. The diameter of the filler rods shall match the diameter of the buffer tubes.

2.1.5 Central Strength Member - The cable shall have a central member designed to prevent buckling of the cable.

2.1.6 Cable Core - The cable core interstices shall be filled with a non-nutritive to fungus, electrically non-conductive, water-blocking material such as water-swellable tape that is dry to the touch. The water blocking material shall be free from dirt and foreign matter.

2.1.7 Cable Rip Cord - The cable shall contain at least one (1) ripcord under the sheath for easy sheath removal.

2.1.8 Tensile Strength Members - The cable shall have tensile strength members that minimize cable elongation due to installation forces and temperature. The cable shall withstand a 607lb tensile load applied per EIA-455-33. The change in attenuation shall not exceed 0.2dB during loading and 0.1dB after loading. The cable shall be rated for an installed tensile service load of 200lb or more.

2.1.9 Cable Jacket - The cable jacket shall be dielectric (with no armoring) and consist of either high density polyethylene (HDPE) or medium density polyethylene (MDPE). Jacketing material shall be applied directly over the tensile strength members and water-blocking material.

2.1.10 Cable Markings - The markings that are provided on the fiber optic cable jacket shall include cable length markings and the year of manufacture. In addition, the cable shall be tagged with a label identifying the cable as belonging to the City of Brentwood (see Plan Drawing No. D03).

2.1.11 Environmental

The fiber optic cable shall be capable of withstanding the following conditions without damage or decrease in function:

- Cable freezing per EIA/TIA–455–98–A.
- Total immersion in water with natural mineral and salt contents.
- Salt spray or salt water immersion for extended periods.
- Wasp and hornet spray.

2.1.12 Connectors

Connectors shall be ST type throughout the fiber optic installation. The measured attenuation of the connector (inclusive of coupler and mated test connector) shall not exceed an average of 0.3 dB for all connectors provided. Any connector found in excess of 0.5 dB will be rejected. Reflectance shall be less than –40 dB, from 14°F to 140°F (–10°C to +60°C).

The connector shall be able to withstand an axial pull of 25lb with no physical damage to the connector and no permanent optical degradation more than 0.3 dB. Connectors shall be pre-wired by the manufacturer.

2.1.13 Fiber Optic Jumper Cables

Jumper cables shall match the fiber type it is attaching to (SM), and shall at a minimum, comply with the following requirements:

- 250 μ m buffering of each fiber.
- 900 μ m buffering of each fiber applied after the initial 250 μ m buffering.
- Maximum factory measured insertion loss of 0.5 dB per EIA/TIA 455–171.
- Less than 0.2 dB loss when subjected to EIA/TIA–455–1B, 300 cycles, 0.5 kg.
- Aramid yarn strength member.
- Rugged PVC sheathing.
- Minimum bend radius of 320 mm following installation, 640 mm during installation.
- Minimum tensile strength of 100 lbf.
- Connectors pre-wired by the manufacturer with strain relief.
- Compliance with NEC requirements for indoor fiber optic cable.

Jumper cables shall be either single fiber or duplex. Duplex jumper cables shall have permanent markings to distinguish between the fibers or connectors.

2.1.14 Connector Modules

Connector Modules shall consist of a connector panel, couplers, protective housing, and a multi-fiber pigtail cable. Connector modules shall be completely assembled and pre-wired by the manufacturer. The measured attenuation of the connector module (inclusive of coupler, fiber, and mated ST test connector) shall not exceed an average of 0.3 dB for all connector modules provided. Any connector module found in excess of 0.5 dB will be rejected. Connector modules shall comply with the following:

- 6 couplers for ST applications.
- 250 μ m buffering of each fiber.
- 900 μ m buffering of each fiber applied after the initial 250 μ m buffering.
- Provided with pre-wired, multi-fiber cable of sufficient length to facilitate fusion splicing in a splice tray that is removed from the fiber optic splice unit.
- Have a durable housing that provides physical protection and strain relief for the termination of the multi-fiber cable to couplers.
- Be easily installed and removed from the termination housing.
- Furnished with protective covers for couplers on the jumper cable side.
- Comply with NEC requirements for indoor fiber optic cable.

There shall be a fixed correlation between each buffered fiber color and coupler position for all connector modules. Fiber color shall meet the requirements for outdoor fiber optic cable.

2.2 Splices

2.2.1 Splice Trays - Splice Trays shall be designed specifically for housing single-mode fusion splices protected by heat-shrink sleeves. Splice trays shall be easily installed and removed from the fiber optic splice unit. Each splice tray shall have provisions for entry of two (2) fully jacketed multi-fiber cables from the connector modules, and two (2) buffer tubes from the distribution cable.

2.2.2 Integrated Fiber Optic Splice and Termination Units

Integrated Fiber Optic Splice and Termination Units shall consist of a single housing with provisions for connector modules, and splice trays. The integrated splice and termination unit shall have provisions for a minimum capacity of 24 fusion splices and 12 terminations using splice trays and connector modules. Connector modules shall face to the front of the rack.

The integrated splice and termination unit shall have a pull-out shelf that allows easy access to the splice tray, buffer tube and fiber storage area that permits fusion splicing to be conducted at a minimum distance of 15 feet from the housing. Units with hinged shelves are not acceptable. The following permanent marking shall be provided on the door or front access panel: "Communication Fiber Optic Cable Termination and Splice Area Inside".

Fiber optic splice and termination units shall be properly sized for the required number of splices and terminations subject to the minimum requirements stated for each configuration. The fiber optic splice and termination units shall meet the following requirements:

- Have provisions for minimum of six (6) fiber optic cable entries.
- Have provisions for internally securing the fiber optic cable sheath and central strength member for a minimum of 12 fiber optic cables.
- Rack mounted.
- Have front and rear doors or removable panels.
- Have a top, bottom, and four (4) sides that fully enclose the interior and protect its contents from physical damage.
- Manufactured using 16 gauge aluminum or equivalent and corrosion resistant.
- Provisions for neatly routing cables, buffer tubes, and fan-out tubing.
- Have cable management brackets or rings integral to the unit to secure and route cables from the connector modules and splice trays to the vertical rack members while maintaining a minimum 38 mm cable radius.

2.2.3 Fiber Optic Splice Units

Fiber Optic Splice Units shall consist of a single housing with provisions for installation of multiple splice trays as required. The splice unit shall have provisions for future installation of 3 splice trays of minimum 24 splice capacity each, in addition to the required amount. Internal, externally protected feed-through provisions are required for routing of the fiber from the splice unit to the termination unit.

The splice unit shall have a pull-out shelf that allows easy access to the splice tray, buffer tube and fiber storage area that permits fusion splicing to be conducted at a minimum distance of 15 feet from the housing. Units with hinged shelves are not acceptable. The following permanent marking shall be provided on the door or front access panel: "Communication Fiber Optic Cable Splice Area Inside".

2.2.4 Fiber Optic Termination Splice Units

Fiber Optic Termination Units shall consist of a single housing with provisions for installation of one or more connector modules as required. The termination unit shall be configured to have a minimum capacity of 12 terminations. Connector modules shall face to the front of the rack. The

following permanent marking shall be provided on the front of the unit: "Communication Fiber Optic Cable Termination Area Inside".

(3) CONSTRUCTION REQUIREMENTS

3.1 Cable length and shipping requirements

Cable shall be furnished in one (1) continuous length per reel, and shall be free from optical splices. A minimum length of 6 feet on each end of the cable shall be accessible for testing. Information accompanying the reel shall include the following either stenciled or lettered on the reel, or provided on a weatherproof tag firmly attached to the reel:

- Factory order number
- Job number
- Ship date
- Manufacturer's cable code
- Type of cable (single mode, outdoor, indoor)
- Beginning and ending length markings
- Measured length and attenuation

3.2 Installation of Fiber Optic Cable

The fiber optic cable shall be installed in conduit, cabinets, pullboxes, and facilities as shown in the Plans and in accordance with manufacturer's installation techniques and procedures. The Contractor shall furnish and install all jumper cables and termination equipment that are functionally necessary to connect fiber optic cable to the required end equipment. The contractor shall install one No. 6 green, unspliced THW/XHHW tracer wire in each conduit. Lubricants used in pulling the tracer wire shall be water soluble. A minimum of 5 feet of tracer wire shall be coiled and secured in the pull box on each end of the conduit run. The ends of the tracer wire in the pull box shall be connected to the grounding wire in the pull box.

The Contractor shall install fiber optic cable as a continuous run and splice only at locations shown on the plans. The Contractor shall determine the length of fiber optic cable necessary to reach from one end of the cable run to the other end of the cable run, including cable slack requirements. The Contractor shall label all fiber optic cables at each end of the cable run, at the point the cable enters a cabinet and at the point the cable exits the cabinet for mid-cable access locations, and in all pull boxes. All labels for fiber optic cables shall identify the cable number and the string numbers of the fibers contained within the cable.

Installation of fiber optic cable and jumper cable indoors shall meet the minimum requirements of local building codes and NEC Article 770, inclusive of the Fine Print Notes (FPN). The cable shall not be pulled along the ground or over or around obstructions. Optical cable shall not be pulled over edges or corners, over or around obstructions, or through unnecessary curves or bends. Bend radius criteria of 10 times the cable diameter under no stress and twenty times cable diameter under stress shall not be exceeded. Manufacturer approved pulling grips, cable guides, feeders, shoes, and bushings shall be used to prevent damage to the cable during installation.

When cable is removed from the reel prior to installation, it shall be placed in a "figure-eight" configuration to prevent kinking or twisting. Care shall be taken to relieve pressure on the cable at the crossover by placing cardboard shims (or equivalent method) or by creating additional "figure-eights".

Before installing any fiber optic cable in conduit, the Contractor shall provide the Engineer the cable manufacturer's recommended and maximum pulling tensions. Included with these pulling tensions shall be a list of the cable manufacturer's approved pulling lubricants. Lubricants shall be used in quantities and in accordance with the procedures recommended by the lubricant manufacturer.

Before installing any fiber optic cable in conduit, all cable pulling equipment shall be approved by the Engineer and the cable manufacturer. The cable pulling equipment shall come with a meter to display pulling tension and a mechanism to ensure that the maximum allowable pulling tension cannot be exceeded at any time during installation.

The Contractor shall furnish attachment hardware, installation guides, and other necessary equipment, not specifically listed herein, as necessary to install the fiber optic cable.

Fiber optic cable in pull boxes shall be appropriately looped and tied to the side wall.

Fiber optic cable shall be routed to the field cabinets as shown on the plans. This shall include all work required to cut or drill into an existing foundation and install a new conduit entrance into the foundation. Concrete cuts shall not be more than 1" greater than the diameter of the conduit being installed. All concrete cuts shall be filled with grout. The existing foundation may be either a pole foundation, or a cabinet foundation. The conduit shall be paid for separately.

3.3 Splicing Methods

All splices shall be accomplished by means of the fusion splice technique and shall not induce more than 0.1 dB attenuation for each splice, and 0.07 dB average for all splices. Splices found to exceed 0.1 dB attenuation shall be re-spliced, at no additional cost to the County, by the Contractor until this requirement is met.

Each splice shall be packaged in a protective sleeve or housing and secured in splice trays located in the fiber optic splice unit or integrated fiber optic splice and termination unit. Bare fibers shall be completely re-coated with a protective heat-shrink coating prior to placement in a sleeve or housing. Heat shrink coating type shall be as recommended by the manufacturer of the fiber optic cable. The heat-shrink coating shall be approved for use by the fiber optic cable manufacturer and installed in such a manner as to protect the fiber from scoring, dirt accumulation, moisture intrusion, and micro-bending.

The Contractor shall only splice fibers at locations that are identified in the Plans. All splices shall be protected and stored in fiber optic splice units or integrated fiber optic splice and termination units that are housed in field cabinets, or facilities.

The fully sheathed, multi-fiber cable of each connector module shall be routed into and secured in a splice tray.

Fiber optic cable shall enter the rear of the fiber optic splice unit or integrated fiber optic splice and termination unit. The fiber optic cable sheath and central member shall be secured inside the unit prior to buffer tube fan-out. All entry holes not utilized shall be plugged. Buffer tubes with fiber designated for splicing shall be routed into and secured in a splice tray. Remaining buffer tubes shall be secured within the splice unit and not accessed.

- **Mid-cable access:** Only fibers within a buffer tube that are designated for splicing shall be individually accessed, spliced to the appropriate fibers from the connector module(s), and secured neatly within the splice tray. The remaining fibers in the buffer tube that are not designated for splicing shall be secured neatly within the splice tray and not cut. Removal of the buffer tube to access the fibers shall be accomplished using equipment specifically designed for buffer tube removal without damaging the individual coated fibers (Corning OFT-000 or equivalent).

- **Full-cable termination:** All fibers including spares, shall be spliced to the appropriate fibers from the interconnect cable and pigtails, and secured neatly within the splice tray.

Termination of distribution fiber shall be accomplished by splicing the distribution fiber to the appropriate fiber from a connector module. Field termination of fibers to connectors by the Contractor will not be permitted unless otherwise approved by the Engineer.

Measured attenuation at each termination (inclusive of 2 connectors and coupler), shall not exceed 0.5 dB.

Fiber terminations shall be neatly and permanently labeled on the connector module to designate transmit or receive (when appropriate) and the string number. Spare fibers shall be labeled as "spare" with the string number.

Blank connector panels, of same finish and manufacture as the connector modules shall be installed for all unused connector module spaces.

Until jumper cables are installed, the Contractor shall provide and maintain protective covers over the optical connectors and termination. Protective covers on terminations not used shall remain.

Jumper cables shall be installed from connector module to end equipment, and from end equipment to end equipment in multiple cabinet configurations. Jumper cables shall be secured to provide strain relief at both the connector module and the end equipment. Manufacturer recommended installation and minimum bend radius requirements shall be adhered to. Jumper cables, which connect to end equipment, shall be labeled at both ends. At field cabinet locations, the label at both ends shall contain the string number, the ring number, transmit or receive, and primary or secondary.

(4) PAY ITEM AND METHOD OF MEASUREMENT

- 4.1 Single mode fiber optic cable shall be measured in linear feet and will be paid for at the Contract unit price per linear foot. This price shall include all materials, labor, tools, equipment, backlashing, and incidentals necessary to complete the work, and all testing and documentation.
- 4.2 Fiber Optic Termination and Splice Units shall be measured in units of each and will be paid for at the Contract unit price per each. Termination units shall contain the necessary fiber optic connector modules, splice trays, and associated splicing for locations indicated on the Plans. This price shall include all materials, labor, tools, equipment, and incidentals necessary to complete the work, and all testing and documentation.

SECTION 13. FLASHER CONTROLLER SPECIFICATIONS

1. SCOPE:

This specification covers minimum acceptable materials and workmanship for a flasher controller in cabinet. It shall be furnished with a standard NEMA electronic flasher relay complete with base, A 15 amp circuit breaker, a terminal strip for field wiring, a radio interference line filter, and transient spark suppression on both field lines and the AC service.

2. CABINET:

- 2.1 The cabinet shall be cast aluminum. It shall be vented by screened vents located in top of cabinet in such a manner as to exclude entrance of precipitation and at least one 1-1/2" screened vent in bottom of cabinet located one side of center by at least 3 inches so as not to interfere with conduit entrance in bottom of cabinet.
- 2.2 The minimum cabinet inside dimensions shall be 12 inches wide x 12 inches high x 7 inches deep.
- 2.3 The complete cabinet shall be painted with a zinc chromate primer and two (2) coats of high grade aluminum paint inside and out.
- 2.4 The main door shall have a Corbin pin-tumbler cylinder lock conforming to the Shelby County Master Key; The Shelby County Key Code shall be furnished the successful bidder at time of award of contract. One (1) key shall be provided with each controller cabinet.

- 2.5 The cabinet shall be equipped with a radio interference filter installed at the electric service line input. The filter shall provide a minimum electrical noise attenuation of 50 decibels over the range of 200 kilohertz to 75 megahertz.
- 2.6 The AC + service line cabinet terminal shall be suppressed with a 150 volt MOV across the line side to ground. Each AC + Signal Display Field Terminal shall have a 150 volt varistor (E MOV #150LA 20A or equal) installed across it to ground.
- 2.7 All barrier terminal blocks shall be Cinch type 150 with numbering strip or equal. This type and size terminal block shall be provided for all field connectors. Terminal blocks shall consist of barrier terminal pairs using a 10-32 size screw with the center-to-center distance between terminal pairs being 5/8 inch.
- 2.8 A ground neutral buss with multiple screw terminals for 12 gauge copper signal neutrals and 4 gauge copper earth connection shall be installed.
- 2.9 Field connectors shall be made at the bottom rear of the cabinet on horizontal terminal strips. Terminal strip blocks shall be positioned not less than two inches nor more than 4 inches from the cabinet bottom.
- 2.10 The cabinet shall be wired in a neat and orderly fashion with all wiring bundled to form a wiring harness attached to the back panel. The terminal strip shall provide for connection of the following circuits:

Four flasher outputs for field connection (two sets of the two circuit flasher outputs) and one circuit to provide a steady 120 VAC to indicate that the school flasher is in the active mode.

3. FLASHER:

The cabinet shall be furnished with and wired for a jack-mounted 120 VAC, dual circuit, all solid-state flasher unit. The flasher shall have a duty cycle of 50 percent at a flash rate of 1 cycle per second. The flasher shall be rated 25 amperes at 120 VAC. A heat sink shall be made part of the flasher body. The flasher shall be a Standard NEMA type.

4. Each bid shall be accompanied by engineering and operational specifications for the equipment bid. Each bidder may be required to furnish a controller for evaluation. If a bidder is requested to furnish a sample controller, it shall be furnished to the County within 15 days of date requested. If the equipment is not submitted as required, the County may reject that bid. All material, parts and workmanship shall be guaranteed for a period of one year after field installation with defective equipment either repaired or replaced entirely at bidder's expense.

- 4.1 Before fabrication of the cabinets is begun, the successful bidder shall submit for approval three (3) copies of complete shop drawings of the cabinet including component and wiring layout.
- 4.2 The supplier shall provide detailed technical circuit description and circuit schematic information applicable to the operation and maintenance of the controller and associated auxiliary equipment. Cabinet wiring diagrams with interconnection details, schematics and maintenance techniques shall be furnished. Information in manual form shall include a material guide which shall contain the replacement part numbers and description of all components used. All solid-state devices shall be listed by their generic name or, in lieu of this, a complete cross-index from manufacturers numbers to generic numbers shall be provided. Parts list shall be itemized with the respective chassis, module or circuit wherein parts may be found.

A total listing of parts without grouping shall be unacceptable. Schematic circuit drawings shall be furnished that are slow to fade when exposed to sunlight over long periods of time. A developed and fixed printing process or one of the forms of printing by actual ink transfer will be acceptable.

SECTION 14. SCHOOL FLASHER SPECIFICATIONS

1. SCOPE:

This specification covers minimum acceptable materials and workmanship for a school flasher controller in cabinet.

It shall be furnished with an on and off switch, a timer that will automatically turn the flasher off after a predetermined time, a standard two circuit NEMA electronic flasher load switch relay complete with base, a 15 amp circuit breaker, a terminal strip for field wiring, a radio interference line filter, and transient spark suppression on both field lines and the AC service.

2. CABINET:

- 2.1 The cabinet shall be cast aluminum. It shall be vented by screened vents located in top of cabinet in such a manner as to exclude entrance of precipitation and at least one 1-1/2" screened vent in bottom of cabinet located one side of center by at least 34 inches so as not to interfere with conduit entrance in bottom of cabinet.
- 2.2 The minimum cabinet inside dimensions shall be 12 inches wide x 12 inches high x 7 inches deep.
- 2.3 The complete cabinet shall be painted with a zinc chromate primer and two (2) coats of high grade aluminum paint inside and out.
- 2.4 The main door shall have a Corbin pin-tumbler cylinder lock conforming to the Shelby County Master Key. The Shelby County Key Code shall be furnished the successful bidder at time of award of contract. One (1) key shall be provided with each controller cabinet.
- 2.5 The on-off switch shall be mounted in the left side of the cabinet wall and shall be keyed to existing school flasher cabinets. A key will be supplied to the successful bidder at time of award of contract. This key is different from the one described for the cabinet. Two keys shall be provided with each cabinet.
- 2.6 The cabinet shall be equipped with a radio interference filter installed at the electric service line input. The filter shall provide a minimum electrical noise attenuation of 50 decibels over the range of 200 kilohertz to 75 megahertz.
- 2.7 The AC + service line cabinet terminal shall be suppressed with a 150 Volt MOV across the line side to ground. Each AC + Signal Display Field Terminal shall have a 150 volt varistor (E MOV #150LA 20A or equal) installed across it to ground.
- 2.8 All barrier terminal blocks shall be Cinch type 150 with numbering strip or equal. This type and size terminal block shall be provided for all field connections. Terminal blocks shall consist of barrier terminal pairs using a 10-32 size screw with the center-to-center distance between terminal pairs being 5/8 inch.
- 2.9 A grounded neutral buss with multiple screw terminals for 12 gauge copper signal neutrals and 4 gauge copper earth connection shall be installed.
- 2.10. Field connectors shall be made at the bottom rear of the cabinet on horizontal terminal strips. Terminal strip blocks shall be positioned not less than two inches nor more than 4 inches from the cabinet bottom.
- 2.11 The cabinet shall be wired in a neat and orderly fashion with all wiring bundled to form a wiring harness attached to the panel. The terminal strip shall provide for connection of the following circuits:

Four flasher outputs for field connection (two sets of the two circuit flasher outputs) and one circuit to provide a steady 120 VAC to indicate that the school flasher is in the active mode.

3. FLASHER:

The cabinet shall be furnished with and wired for a jack-mounted 120 VAC, dual circuit, all solid-state flasher unit. The flasher shall have a duty cycle of 50 percent at a flash rate of 1 cycle per second. The flasher shall be rated 25 amperes at 120 VAC. A heat sink shall be made part of the flasher body. The flasher shall be a Standard NEMA type.

4. TIMER:

The timer shall be capable of being set to a predetermined time settable from 2 to 60 minutes in one minute

increments. The timing event shall be initiated by the keying "on" of the on-off switch and shall be terminated either by expiration of the preset time on the timer or by keying the on-off switch to the "off" position.

The timer shall be mounted in such a position that all controls and indicators face the front of the cabinet.

Quality reference for the timer is the Eagle Signal HP5 Series Cycle-Vlex (R) Reset Timer Model 9.

Output Rating of Contacts: 10 amps resistive, 120 VAC.

Power on Response: 28 ms avg. pull-in.

Drop-Out: 17 ms avg. drop-out.

Operating Temperature: +32 degrees to 140 degrees F.

Standards Recognition: UL, CSA, and F.M. approved.

5. Each bid shall be accompanied by engineering and operational specifications for the equipment bid. Each bidder may be required to furnish a controller for evaluation. If a bidder is requested to furnish a sample controller, it shall be furnished to the County within 15 days of date requested. If the equipment is not submitted as required, the County may reject that bid. All material, parts and workmanship shall be guaranteed for a period of one year after field installation with defective equipment either repaired or replaced entirely at bidder's expense.

- 5.1 Before fabrication of the cabinets is begun, the successful bidder shall submit for approval, three (3) copies of complete shop drawings of the cabinet including component and wiring layout.

- 5.2 The supplier shall provide detailed technical circuit description and circuit schematic information applicable to the operation and maintenance of the controller and associated auxiliary equipment. Cabinet wiring diagrams with interconnection details, schematics and maintenance techniques shall be furnished. Information in manual form shall include a material guide which shall contain the replacement part numbers and description of all components used. All solid-state devices shall be listed by their generic name or, in lieu of this, a complete cross-index from manufacturers numbers to generic numbers shall be provided. Parts list shall be itemized with the respective chassis, module or circuit wherein parts may be found.

A total listing of parts without grouping shall be unacceptable. Schematic circuit drawings shall be furnished that are slow to fade when exposed to sunlight over long periods of time. A developed and fixed printing process or one of the forms of printing by actual ink transfer will be acceptable.

SECTION D

SHELBY COUNTY GOVERNMENT

ENGINEERING DEPARTMENT

GENERAL REQUIREMENTS AND CONDITIONS

SHELBY COUNTY GOVERNMENT
ENGINEERING DEPARTMENT
GENERAL REQUIREMENTS AND CONDITIONS

SECTION 1. DEFINITION OF TERMS

Whenever in the Specifications and Contract the following terms or pronouns in place of them are used, the intent and meaning shall be interpreted as follows:

1.01 County:

Shall be interpreted to mean THE COUNTY OF SHELBY, TENNESSEE, or its authorized representative.

1.02 Director

Shall be interpreted to mean THE SHELBY COUNTY DIRECTOR OF PUBLIC WORKS.

1.03 Engineer

Shall be interpreted to mean The SHELBY COUNTY ENGINEER, and/or the Project Manager delegated by the County Engineer to act as the County's authorized representative.

1.04 Project Manager:

The representative of the SHELBY COUNTY ENGINEER who has been delegated to act with the authority of the Engineer.

1.05 Bidder:

Any individual, firm, joint venture, or corporation submitting a proposal for work contemplated, acting directly or through a duly authorized representative.

1.06 Contractor:

The successful bidder to whom the contract is awarded.

1.07 Sub-contractor:

Any individual, firm, partnership, or corporation to whom the Contractor, with the written consent of the County, sublets, assigns, or otherwise disposes of any part of the work governed by the contract.

1.08 Surety:

Any corporation, individual or individuals, who engage to be responsible for the bidder's action in the execution of the contract upon the award of such; or who are bound with and for the Contractor to insure acceptable performance of the contract, payment of all obligations pertaining to the work, and fulfillment of such other conditions as may be specified or otherwise required by law.

1.09 Notice of Letting:

The official notice, sent to all prospective bidders, inviting proposals for all proposed improvements included in any one letting.

1.10 Notice to Bidder:

The official notice, included with the proposal form, inviting bids for the proposed improvement.

1.11 Plans:

All official drawings or reproductions of drawings detailing the work to be performed by the Contractor.

1.12 Proposal:

The written offer of the Bidder to perform the proposed work.

1.13 Specifications:

The collection of general directions, provisions, requirements and any supplements duly authorized and distributed by the County. This shall include written agreements, bonding requirements, quantities of materials to be furnished, and other documents detailing the methods or manner to be used to perform the work in a satisfactory manner. Please see section 4.01 for additional information.

1.14 Special Provisions:

Any and all directions, details, and requirements prepared to govern the method or manner of performing work of a specific nature which may not be adequately covered by the specifications. The special provisions shall govern the work and shall take precedence over the specifications and plans wherever they conflict therewith, but they shall not operate to annul those portions of the specifications with which they are not in conflict.

1.15 Proposal Guarantee:

Security required as assurance that the bidder, if determined to be the lowest, responsive and responsible bidder, will post the required bond and enter into a contract with the County for the acceptable performance of the work.

1.16 Award:

The acceptance of the lowest, responsive and responsible bidder subject to the execution and approval of a satisfactory contract, bonding to secure the performance thereof, submittal of the required certifications of insurance, and adherence to any and all other conditions as may be specified or otherwise required by law.

1.17 Contract:

The written agreement covering the performance of the work and the furnishing of labor and materials for the construction of the work. The contract includes the proposal, contract bond, plans, specifications, general requirements and conditions, special provisions, and all other material bound herewith, and any and all supplemental agreements.

1.18 Supplemental Agreement:

The written agreement executed by the County and the Contractor, with the assent of the surety, governing modifications or alterations of the terms of the original contract.

1.19 The Work:

The total construction process necessary to satisfactorily complete the contract including any and all authorized alterations, extensions, and deductions. Also included is all labor, tools, equipment, materials and incidentals necessary for the satisfactory completion of the contracted improvement.

1.20 Word Usage and Gender:

Except where the context clearly indicates to the contrary, words in the present tense include the future, words in the singular include the plural and words in the plural include the singular.

The masculine gender shall include the feminine, the feminine gender shall include the masculine, and the neuter gender shall include both masculine and feminine.

The word "shall" refers to mandatory requirements.

The words "Authorization" and "Authorized" shall mean authorization in writing by the appropriate authority.

1.21 Latent Defect:

A defect that existed at the time of County acceptance but could not be discovered by a reasonable inspection.

SECTION 2. PROPOSAL REQUIREMENTS AND CONDITIONS

2.01 Contents of Proposal Form:

The County shall furnish a set of contract documents to each potential Bidder upon receipt of a non-refundable deposit as set forth in the official notice to bidders. All documents bound with or attached to the contract shall be included as part of the Bidder's proposal form and shall not be detached or altered. Any subsequently issued addenda shall be attached to the set of contract documents and shall become part of the contract bid documents.

2.02 Interpretation of Estimate of Quantities:

A table of estimated quantities of materials to be furnished by the Contractor shall be included as part of the contract documents. The estimated quantities are given only as a basis for comparison of the proposals and the award of the contract. The County does not expressly or by implication agree that the actual quantities shall correspond to the estimated quantities. The Bidder shall not plead misunderstanding or deception because of errors or discrepancies in said estimates of quantities, or in the character, locations, or other conditions pertaining to the work.

Final payment shall be based upon actual quantities used to complete the work at the contract unit prices as bid, but in no case shall payment be made for quantities over and above those specified by the plans, specifications, or special provisions unless otherwise directed by the Engineer. In the event of disputes over actual quantities to be paid, the Engineer's decision shall be final. The County reserves the right to omit bid items entirely or to increase or decrease any or all bid items. No allowance shall be made for any change in anticipated profits due to an increase, decrease, or deletion in the original estimated quantities.

2.03 Examination of Plans, Specifications, Special Provisions, and Site of Work:

Each Bidder shall, before submitting a bid, carefully examine the proposal, plans, specifications, special provisions, and contract and bonding forms. The Bidder shall inspect, in detail, the site of the proposed work and shall become familiar with any local conditions or detailed requirements of construction that may affect the progress of the work. The Bidder shall be responsible for proposal errors resulting from failure or neglect to comply with these instructions. The County shall not be responsible for any circumstances, events, or interpretations that cause or may cause a change in anticipated profits resulting from such failure or neglect.

2.04 Preparation of the Proposal:

Each Bidder's proposal shall be submitted on the form furnished by the County. The proposal shall be executed properly and bids shall be made for all items indicated on the proposal form. Except where requested or allowed by the special provisions, alternate bids will not be required, nor will alternate bids be used in the bid evaluation process. The Bidder shall indicate, in figures, a lump sum for the entire work or a unit price for each of the separate items stipulated in the proposal. For unit price contracts, the Bidder shall calculate the products of the respective quantities and unit prices in the column provided for that purpose. The gross sum of the proposal shall be the summation of the said products and shall be entered on the proposal form in the space provided. All bids shall be conditional upon furnishing of a bid bond executed by a corporate surety company satisfactory to the County. All writing shall be printed in ink or by

typewriter except the signature of the Bidder, which shall be written with the printed name beneath. Unit prices shall govern and any errors found in the product of a unit price and quantity shall be corrected and the correction reflected in the gross sum.

2.05 Proposal Guaranty:

Each proposal shall be accompanied by a bank draft, a cashier's check, a properly certified check, a letter of credit by a national bank or certificate of deposit therein, duly assigned, or an approved bid bond for not less than the percentage designated in the Notice to Bidders of the amount of the bid made payable to the County. In no case shall a bank cashier's check, bank draft, certified check, or other indemnity, as set out above, for less than \$300 be accepted.

2.06 Delivery of Proposals:

Proposals shall be delivered prior to the time of opening, to the place indicated in the Notice to Bidders. Each proposal shall be placed in a sealed envelope, plainly marked to indicate its contents including the sealed bid number and project name. Only sealed proposals shall be accepted.

Proposals sent by mail or special courier service shall not be opened, unless received at the place of letting prior to the time of opening proposals. Envelopes postmarked prior to the time of opening proposals but not received at the place of letting prior to the time of opening proposals shall not be accepted.

2.07 Withdrawal of Proposals:

Permission shall be given a Bidder to withdraw a proposal if a request is made in writing and received by the County before the time for opening proposals. If a proposal is withdrawn, the Bidder shall not be permitted to submit a proposal for the same work section at the same letting.

2.08 Public Opening of Proposals:

Proposals shall be opened and read publicly at the time and place specified in the Notice to Bidders. Bidders, their authorized agents, and other interested parties are invited to be present.

2.09 Rejection of Proposals:

Proposals not accompanied by an approved form of proposal guaranty or which contain omissions, erasures, alterations, additions or alternates not specified by the original contract documents or other irregularities, may be rejected by the County as informal or insufficient.

2.10 Disqualification of Bidders:

All bidders are hereby advised that no award of contract will be made to any firm or individual that is currently debarred by the STATE OF TENNESSEE or the FEDERAL HIGHWAY ADMINISTRATION.

Any one or more of the following reasons may be considered sufficient for rejection of bids and disqualification of a Bidder:

- (a) More than one proposal for the same work from an individual, firm, partnership, or corporation under the same or different names.
- (b) Evidence of collusion among Bidders. Participants in such collusion shall receive no recognition as Bidders for any future lettings by the County.
- (c) Unbalanced proposals in which the prices for items are not in proportion to prices for other items.
- (d) Failure to submit a unit price for each item of work listed in the proposal.
- (e) Unsatisfactory performance record as shown by past work for the County, judged from the standpoint of workmanship and progress.

- (f) Contractor's uncompleted workload which, in the judgment of the County, might hinder or prevent the prompt completion of work covered by these contract documents.
- (g) Lack of competency as revealed by financial statement or experience questionnaire, which may be required.

2.11 Competency of Bidders:

The bidder, if a corporation, shall show the name of the state in which the corporation is chartered.

All bidders must be prequalified by and in good standing with the Tennessee Department of Transportation. To be considered for prequalification prospective bidders shall file a "Prequalification Questionnaire" with the Tennessee Department of Transportation at least fourteen (14) days prior to the date of the opening of proposals. A prospective subcontractor, including DBE contractors, must be prequalified by and in good standing with the Tennessee Department of Transportation prior to being approved as a subcontractor and before any work takes place.

Upon award of the contract the apparent low bidder and subcontractors must demonstrate evidence of being licensed by the Tennessee State Board of Licensing General Contractors in accordance with TCA 62-6-119.

SECTION 3. AWARD AND EXECUTION OF CONTRACTS

3.01 Consideration of Proposals:

The unit price proposals received shall be compared on the basis of the summation of the products of the items of work listed and the unit prices offered. In case of a discrepancy between the gross sum shown in the proposal and that obtained by the summation of the products of the quantities of work and the unit prices, the unit prices shall govern, and any errors found in said products shall be corrected by the County. This corrected gross sum shall be the amount used to evaluate the proposal.

The County reserves the absolute right to reject any or all proposals, to advertise for new proposals, or to proceed to do the work otherwise, if, in the judgment of the County, the best interest of the County will be promoted thereby.

3.02 Award of Contract:

Except in cases where the County exercises the right reserved to reject any or all proposals, the contract will be awarded by the County, as soon as practicable after the opening of the bids, to the Bidder who has submitted the lowest, responsive and responsible bid.

If a contract is not awarded within 120 days of the opening of proposals, a Bidder may withdraw bids upon written notification to the County.

3.03 Return of Proposal Guaranty:

The proposal guarantees of all except the two lowest responsible Bidders shall be returned promptly after the proposals have been checked, tabulated, and the relation of the proposals established. Proposal guarantees of the two lowest responsible Bidders will be returned as soon as the contract and bond of the successful Bidder have been properly executed and approved.

3.04 Requirement of Contract Bond:

The successful Bidder, at the time of the execution of the Contract, shall deposit with the County a surety bond for the full amount of the contract. The form of bond and the surety shall be acceptable to the County.

3.05 Execution of Contract:

The Contract, executed by the Bidder, and the bond, executed by the principal and the sureties, shall be presented to the County within 14 days after the date of written notification of the award of the Contract.

3.06 Failure to Execute Contract:

Failure on the part of the successful Bidder to execute a contract and an acceptable bond, as provided herein, within 14 days from the date of notice of the award of the Contract, shall be considered as just cause for annulment of the award and forfeiture of the proposal guaranty to the County. This forfeiture of proposal guaranty shall not be considered a penalty, but, rather, as payment of liquidated damages sustained as a result of such failure.

3.07 Government Funding Clause:

This Contract is subject to annual appropriations of funds by the County. In the event the County does not appropriate funds for any fiscal period, this Contract may be terminated. In the event of such termination, Contractor shall be entitled to receive just and equitable compensation for any satisfactory work performed as of the termination date. Any retainage being held or payments due the Contractor will be paid to the Contractor within sixty (60) days of termination.

SECTION 4. SCOPE OF THE WORK

4.01 Intent of the Plans and Specifications:

The intent of the plans and specifications is to define the complete works contemplated by the County which are to be undertaken by the Contractor in full compliance with the contract.

The Contractor shall perform all specified construction and such additional, extra, and incidental construction as may be necessary to complete the work to the finished lines, grades, cross-section and descriptions in a substantial and acceptable manner. The Contractor shall furnish all required materials, equipment, tools, labor and incidentals, unless otherwise provided in the contract, and shall include the cost of these items in the bid.

Unless otherwise specified in the plans, specifications or special provisions, all applicable site, road and bridge work will be performed in accordance with the latest edition of the Tennessee Department of Transportation Standard Specifications for Road and Bridge Construction.

Differing Site Conditions:

1. During the progress of the work, if subsurface or latent physical conditions are encountered at the site differing materially from those indicated in the contract or if unknown physical conditions of an unusual nature, differing materially from those ordinarily encountered and generally recognized as inherent in the work provided for in the contract, are encountered at the site, the Contractor discovering such conditions shall promptly notify the Engineer in writing of the specific differing conditions before they are disturbed and before the affected work is performed.
2. Upon written notification, the Engineer will investigate the conditions, and if he determines that the conditions materially differ and cause an increase or decrease in the cost or time required for the performance of any work under the contract, an adjustment, excluding loss of anticipated profits, will be made and the contract modified in writing accordingly. The Engineer will notify the Contractor of his determination whether or not an adjustment of the contract is warranted.
3. No contract adjustment which results in a benefit to the Contractor will be allowed unless the Contractor has provided the required written notice.

Significant Changes in the Character of Work:

1. The Engineer reserves the right to make at any time during the work, such changes in quantities and such alterations in the work as are necessary to satisfactorily complete the project.
2. If the alterations or changes in quantities significantly change the character of the work under the contract, whether or not changed by any such different quantities or alterations, an adjustment, excluding loss of anticipated profits, will be made to the contract. The basis for the adjustment shall be agreed upon prior to the performance of the work. If a basis cannot be agreed upon, then an adjustment will be made either for or against the Contractor in such amount as the Engineer may determine to be fair and equitable.
3. If the alterations or changes in quantities do not significantly change the character of the work to be performed under the contract, the altered work will be paid for as provided elsewhere in the contract.
4. The term "significant change" shall be construed to apply only to the following circumstances:
 - (a) When the character of the work as altered differs materially in kind or nature from that involved or included in the original proposed construction or
 - (b) When a major item of work is increased in excess of 125% or decreased below 75% of the original contract quantity. Any allowance for an increase in quantity shall apply only to that portion in excess of 125% of original contract item quantity, or to the amount of work performed in case of a decrease below 75%.

4.02 Special Work:

Should any construction or requirements not covered by the specifications be anticipated on any proposed work, special provisions for the same shall be prepared and included in the proposal form. These special provisions shall be considered as part of specifications, the same as though fully contained therein.

4.03 Alterations, Cancellations, Extensions and Deductions:

The County reserves the right to alter the plans, increase or decrease the improvement, add such incidental work as may be necessary, and increase or decrease the quantities of work to be performed in accordance with such changes, including, in the case of Unit Price contracts, the deduction or cancellation of any one or more of the unit price items. Such changes shall not be considered as a waiver of any conditions of the contract nor to invalidate any of the provisions thereof. If an increase in cost and/or time is necessary, it will be agreed upon prior to beginning any work on the change except when the project will be unduly delayed. In such case, the work will be started on a force account until final agreement is reached and confirmed in writing.

In Lump Sum contracts, a negotiated supplemental agreement between the Contractor and the County shall be required for any change increasing or decreasing contract price and/or time. The negotiations will be based on a proposal submitted by the Contractor to the Engineer detailing the elements that require contract modification in cost and/or time.

In Unit Price contracts, a written supplemental agreement between the Contractor and the County shall be required for each individual change which involves a net increase or a net decrease in the amount of the contract of more than 25 per cent of the original total contract price. A series of separate changes amounting to more than 25 percent of the original total contract price over the duration of the contract are not subject to this requirement.

Should such changes in the plans result in an increase or decrease in the quantities of the work to be performed, the Contractor shall accept payment as follows:

- (1) All work that appears in the contract as specific items accompanied by unit prices shall, except as provided in Paragraph (2) below, be paid for at the contract unit prices. No allowance shall be made for delays or decreases of anticipated profits.
- (2) All such work not appearing in the contract under specific unit prices shall be designated as extra work and paid for as specified in Section 9, Measurement and Payment. This shall include work

which involves a substantial change in the location or in the nature of the design or in the type of construction which materially increases or decreases the cost of the work and which is not included in the prices bid for other items in the contract.

- (3) In cases where the total value of the work involved in the changes requires a supplementary agreement and the nature and scope of such work is such to require working methods or equipment at variance with and more costly than those required for the original quantities as shown on the plans and stated in the proposal, the Contractor may ask for an adjustment in unit prices which may be made by a negotiated agreement between the Contractor and the Engineer. No adjustment of prices shall be approved by the County without submittal of a cost/time proposal from the Contractor satisfactory to the Engineer.

If directed by the Engineer, the Contractor's cost proposal will be broken down into direct and indirect labor, overhead and profit, material costs, and equipment rental or ownership costs and other such factors as may be necessary to properly evaluate any cost proposal.

Once a supplemental agreement is agreed upon, it will be confirmed in writing and forwarded with a "Notice to Proceed" for the changed work. If an adjusted price cannot be thus agreed upon, the work may, by agreement between the Contractor and the Engineer, be done as extra work on a force account basis as provided in Section 9.07 (3), Payment for Extra Work.

Claims for extra work that have not been authorized in writing by the County shall be rejected.

4.04 Maintenance of Detours:

If and when detours are authorized, the Contractor shall, at the direction of the Engineer, set up, mark, and maintain suitable detour signs. The responsibility for maintenance of detours, including all traffic control devices, shall specifically be the responsibility of the Contractor, at no additional compensation, except as otherwise provided for in the special provisions or as noted on the plans. All road signs, pavement markings or other traffic control devices shall be in conformance with the latest edition of the Manual on Uniform Traffic Control Devices.

4.05 Removal and Disposal of Structures and Obstructions:

Existing structures, such as manholes, sewer pipes, culverts, fences and buildings, which are not to remain in place, shall be removed by the Contractor in accordance with the special provisions. Salvageable material shall be transported or stored as directed by the Engineer.

4.06 Final Cleanup and General Surface Restoration:

Before final acceptance of the work to be done under this contract, the Contractor shall restore the job site to its original or better condition and shall repair or replace all private and public property damaged, moved or otherwise displaced in the construction of the improvement. No additional compensation shall be allowed for this work.

4.07 Closing of Traveled Ways:

No public or private thoroughfare including, but not limited to, entrances, exits, pedestrian walkways, or other established routes of transportation shall be closed, diverted, or otherwise restricted without prior written authorization of the Engineer.

If and when authorized by the Engineer, the closing of roads, driveways, sidewalks and parking areas required for the construction of the improvement including the placement and maintenance of any barricades or traffic control devices shall be the sole responsibility of the Contractor as noted in Paragraph 4.04 Maintenance of Detours, above, and in Paragraph 7, Barricades and Warning Signs, at no additional compensation.

When authorized by the Engineer, the Contractor shall, within no less than seven (7) days prior to the closure of the road, notify the following individuals or agencies completely describing the affected roads and the approximate duration of the construction. These parties include, but are not limited to:

- 1). County Sheriffs Department
- 2). County Fire Department
- 3). Ambulance service(s)
- 4). County School Superintendent
- 5). United States Postal Service
- 6). County Road Department
- 7). Civil Defense/Emergency Management Agency
- 8). Shelby County Public Affairs Office
- 9) Local jurisdiction engineering and law enforcement departments

4.08 Schedule of Prices-Lump Sum Contracts:

The Contractor shall submit a Schedule of Prices to the Engineer prior to the first request for payment. The Schedule of Prices shall breakdown the contract to major line item elements for the purposes of estimating progress payments. Each line item will show, with as much accuracy and balance as possible, the quantity, unit, and unit price. The Schedule of Prices will not be used as a firm basis in estimating future additive and deductive supplemental agreements.

SECTION 5. CONTROL OF WORK

5.01 Contractor to Supervise the Work:

The Contractor shall have control and be in charge of the work under this contract. The Contractor shall have and retain full and complete responsibility for construction means, methods, techniques, sequences or procedures; and for all safety precautions and programs for all employees, agents, servants or representatives, including all sub-contractors and for the public in general. The Contractor specifically agrees to assume these responsibilities. The Engineer shall not be responsible for any of the above procedures.

5.02 Authority of the Engineer:

The Engineer shall be the interpreter of the requirements of the contract and associated documents and shall be the sole judge of the performance and acceptability of the Contractor's work. The Engineer shall have the right to reject defective work so that the completed project will conform to the requirements of the contract. The Engineer shall also be the final authority in deciding any and all disputes involving quality and acceptability of materials furnished, interpretation of the plans, specifications and special provisions, acceptable fulfillment of the contract, compensation, disputes and mutual rights of the Contractors under the contract.

In case of failure on the part of the Contractor to execute work ordered by the Engineer, the Engineer may, at the expiration of a period of 48 hours after delivering notice in writing to the Contractor, proceed to execute such work as may be deemed necessary, and the cost thereof shall be deducted from compensation due or which may become due the Contractor under the contract.

5.03 Contractor's Representative:

The Contractor shall designate a management representative to be on the job site whenever construction work is being performed. This representative shall have the authority to make any and all decisions pertaining to the completion of all contracted responsibilities and shall be responsible for the supervision of all Contractor's and sub-contractor's work crews.

The Contractor's management representative shall also have the authority to deviate from normal procedures as needed, satisfy complaints in a timely manner, and respond to any unforeseen circumstances which would require direct management decisions. If a situation arises that would require decisions that the Contractor's management representative cannot make, then all work shall cease until the Contractor designates a new management representative capable of making the decisions necessary to satisfactorily complete the work.

This new management representative will then assume all duties and responsibilities of the previous representative.

5.04 Plans and Shop Drawings:

Five (5) copies of the plans and two (2) copies of the specifications and special provisions will be furnished to the Contractor by the County.

The Contractor shall submit to the Engineer, for approval, four (4) copies of each shop, working, or layout drawing pertaining to the construction of the work as are required in the contract documents. All such documents shall be stamped and signed by a Licensed Professional Engineer registered by the State of Tennessee. Any work done or materials ordered prior to the approval of such plans or drawings shall be at the Contractor's risk.

The Engineer will approve or reject said shop drawings or similar documents and return two (2) annotated copies to the contractor. Engineer's approval of the shop drawings or similar documents shall in no way relieve the Contractor from responsibility for errors, omissions, or other irregularities in said shop drawings or documents. It shall specifically be the responsibility of the Contractor to verify all dimensions, coordinate with job site conditions, review and approve all information which relates to the process of fabrication or techniques of construction, and be responsible for the coordination of the work of all trades.

The cost of furnishing such drawings shall be incidental to the contract and no additional compensation shall be allowed the Contractor for any delays resulting therefrom.

5.05 Conformity With Plans:

The finished work shall conform to the plans, with the exception of such deviations as may be authorized by the Engineer.

5.06 Coordination of Specifications, Plans, Proposal and Special Provisions:

The specifications, the accompanying plans, the proposal, the special provisions, the general requirements and conditions, easement agreements, permit requirements and all supplementary documents are intended to describe a complete work and are essential parts of the contract.

A requirement occurring in any of them shall be binding. In case of discrepancy, dimensions shown in figures shall govern over scaled dimensions, specifications shall govern over plans, special provisions shall govern over both specifications and plans, and quantities shown on the plans shall govern over those shown in the proposal. Conditions of easement agreements and permit requirements shall govern over all other documents providing their requirements exceed the requirements of said other documents. The Contractor shall take no advantage of any apparent error or omission in the plans or specifications, and the Engineer shall be permitted and shall have the final authority to make such corrections and interpretations as deemed necessary for the fulfillment of the intent of the plans and specifications.

5.07 Cooperation by Contractor:

The Contractor shall notify the Engineer, in writing, a minimum of two working days in advance, of intention to begin work on the proposed improvement.

The Contractor will be furnished five (5) copies of the plans, and two (2) copies of the specifications and special provisions at no cost to the contractor. The Contractor shall keep one legible copy (field copy) of each available on the work site at all times during its prosecution. The Contractor shall make available to the Engineer or his representative the field copy of the plans and/or specifications for review. The Contractor shall be responsible for supplying sub-contractors, materials suppliers and others with copies of plans and specifications as needed.

The Contractor shall give attention to the work sufficient to produce optimum progress thereof and shall fully cooperate with representatives of the County. There shall be on the work site at all times a competent English speaking representative authorized to receive orders and act for the Contractor, as designated in Section 5.03, Contractor's Representative, above.

5.08 Cooperation with Utilities:

The Contractor shall notify all utility companies, public and private, in advance of commencing work. The responsibility for moving water lines, gas lines, wire lines, service connections, water and gas meter boxes, water and gas valve boxes, light standards, cable ways, signals and all other utility appurtenances which are located within the limits of the proposed construction shall be assumed by the Contractor at no additional compensation, except as otherwise provided for in the special provisions or as noted on the plans.

It is understood and agreed that the Contractor has considered all of the permanent and temporary utility appurtenances in their present or relocated positions and that no additional compensation shall be allowed for any delays, inconvenience, or damage sustained due to any interference from the said utility appurtenances or the operation of moving them either by the utility companies or by said Contractor, or on account of any special construction methods required in prosecuting the work due to the existence of said appurtenances either in their present or relocated positions. The Contractor shall be liable for any and all damage done to utilities by his forces.

Where water lines and sewer lines conflict, water lines shall be placed over sewer lines unless otherwise directed by the Engineer and shall conform to requirements of the State of Tennessee, Department of Public Health, Division of Sanitary Engineering and the Shelby County Health Department.

5.09 Encroachment on Rights-of-Way and Easements:

Except where otherwise specified in the plans, specifications or special provisions, the Contractor shall be responsible for following any special instructions or requirements to work within the rights-of-way or easements of any public or private utilities, railroad companies, gas transmission companies, or any other public or privately owned entities where work may occur. The Contractor shall also be responsible for fully complying with the established procedures of the above applicable entities including, but not limited to, obtaining permits, notification of when work is to be performed, providing any required insurance coverage, providing any required special construction procedures, and payment of any fees required by the above mentioned entities. No additional compensation shall be allowed for the expense involved in following the above instructions and any and all costs shall be included with the contract unit prices. The Contractor shall not be responsible for obtaining rights-of-way or easements for the County in order to perform the work described in the contract documents.

5.10 Construction Permits:

All construction permits such as grading, road cuts and other necessary and related permits, shall be obtained by the Contractor from the County Engineering Department prior to commencing the pertinent phase of the work.

5.11 Authority and Duties of Project Manager:

The Project Manager has been delegated authority by the County Engineer to act as the "Engineer" (see Section 5.02). This authority has been limited only as to final resolution of disputes. The Project Manager has full authority to permit changes in cost and time. Any cost or time increase authorized by anyone other than the Project Manager or the County Engineer will be disallowed. Any such increase will be authorized in writing except in unusual cases in which undue delay or cost may be occasioned in which a verbal "Notice to Proceed" will be issued followed as soon as possible by written confirmation.

5.12 Authority and Duties of Inspector:

Inspectors employed or contracted by the County shall be authorized to inspect work and materials, and to perform such other duties as may be designated by the Engineer. The inspector shall have the authority to accept or reject any and all work to insure proper compliance to the plans and specifications except matters involving changes in cost or time will be referred to the Project Manager.

5.13 Removal of Defective and Unauthorized Work:

All work that has been rejected or condemned shall be remedied or removed and replaced in a manner approved by the Engineer, at the Contractor's expense. Upon failure on the part of the Contractor to comply promptly with any order of the Engineer made under the provisions of this article, the Engineer will, after giving notice to the Contractor, have the authority to cause defective work to be remedied, or removed and replaced, or to cause unauthorized work to be removed and to deduct the cost thereof from any compensation due, or to become due, the Contractor.

Work done without lines and grades being given, or beyond the lines shown on the plans, or any extra work done without authority, shall be considered as unauthorized and at the expense of the Contractor, and shall not be measured or paid for. Work so done may be ordered removed or replaced at the Contractor's expense.

5.14 Orderly Work Site Conditions:

The Contractor shall, at all times, keep the work site free from waste material and rubbish which may accumulate during the construction process. All stored materials and equipment shall be placed so as to cause a minimum of inconvenience to other contractors and/or the public.

5.15 Final Inspection:

The Engineer, or his representative(s), shall make final inspection of all work included in the contract, or any portion thereof, as soon as practicable after notification by the Contractor that the work is complete and ready for acceptance. If the work is not acceptable to the Engineer at the time of such inspection, the Contractor shall be informed in writing as to the particular defects to be remedied before final acceptance can be made.

SECTION 6. CONTROL OF MATERIALS AND EQUIPMENT

6.01 Quality of Materials:

It is the specific intent of this contract to insure that only materials and/or equipment which conform to the requirements of the plans, specifications, and special provisions be used in all aspects of the construction process. All work shall be performed in such a manner as to produce a completed project that is workmanlike and acceptable in every detail. Copies of all tests shall be furnished to the Engineer.

6.02 Defective Materials or Equipment:

All materials or equipment not conforming to the plans, specifications, and special provisions shall be considered defective and shall be removed from the work and, if in place, they shall be removed at the Contractor's expense and replaced with acceptable materials or equipment meeting the said specifications. Any and all work done to correct defective construction shall proceed only after the corrective procedures have been approved by the Engineer. Upon failure of the Contractor to comply with any order of the Engineer pursuant to these provisions, the Engineer shall have authority to remove and replace defective materials and/or equipment and to deduct the cost of the removal and replacement from any monies due or to become due the Contractor.

6.03 Submittal and Testing Plan:

The Contractor shall carefully review all contract provisions, plans and specifications and prepare, for submittal at the pre-construction conference, a list of all submittals required by this contract. Additionally, a separate list shall be provided of all testing to be performed by the Contractor or his laboratory.

6.04 Sampling, Testing, Cited Specifications:

When requested by the County, the Contractor shall furnish a completed written statement of the origin, composition, and manufacture of any or all materials (manufactured or produced) which are to be incorporated in the work.

Unless otherwise provided, all materials shall be sampled and tested in accordance with the latest published standard methods of the American Society for Testing Materials (A.S.T.M) and/or the American Association of State Highway and Transportation Officials (AASHTO) and revisions thereof, in effect on the date of the invitation of bids, where such standard methods exist. In case there are no A.S.T.M. or AASHTO standards that apply, applicable standard methods of other recognized standardizing agencies shall be used as directed by the Engineer. The Contractor shall furnish an affidavit from the manufacturer or material supplier that the materials meet the specified requirements and tests.

The Engineer or his authorized representative shall have full authority to decide the sampling or testing methods to be used, and shall have the power to reject any and all materials or equipment which fails to meet the terms of the specifications. Such materials or equipment shall be removed from the work hereunder at the Contractor's expense. All materials or equipment that develop defects during the storage or construction period shall be removed and replaced, notwithstanding that they may have previously passed prescribed inspections or tests.

6.05 Inspection and Testing of Materials:

Unless otherwise provided, all testing shall be made by an independent testing laboratory designated or approved by the Engineer. The Contractor shall pay for the costs of tests, unless otherwise provided in the Special Provisions and/or in the Specifications. The Contractor shall furnish the materials to be tested, incidental materials and labor required at the site in connection with the tests and the transportation of materials to be tested to the laboratory. Any and all costs involved in the inspection and testing of materials shall be included in the unit prices as set forth in the contract and no additional compensation shall be allowed.

6.06 Stored Materials:

If it is necessary to store materials, they shall be protected in such a manner as to insure the preservation of their quality and suitability for the work. All stored materials shall be inspected at the time of use in the work, even though they may have been inspected and approved before being placed in storage. The Contractor shall be responsible for the loss, theft, or damage of all stored material on the job site even if partial payment has been made for said stored materials.

6.07 Warranty and Guarantees:

All work performed under this contract shall be constructed in accordance with the plans, specifications, general requirements and conditions, special provisions, and/or standard construction codes, and shall be guaranteed against defective material and workmanship by the Contractor and the Surety for a period of one year from the date of final acceptance.

The Contractor and the Surety shall guarantee that the type, quality, design, and performance of all items and equipment to be incorporated into the completed project meet all requirements of the contract documents and any other provisions provided by the Engineer.

The Contractor shall require of all equipment and material manufacturers and suppliers a written guarantee that all equipment and material shall function satisfactorily as an integral part of the completed project in accordance with the contract documents and any and all other provisions as supplied by the Engineer. This guarantee shall insure that the manufacturer or supplier will replace or repair, to the satisfaction of the Engineer, any and all defects in equipment and materials which may develop within a period of one year from the date of final acceptance. This guarantee shall be submitted to the Engineer prior to incorporation of the equipment, material or supplies into the project.

This guarantee shall in no way relieve the Contractor of any responsibility for providing for satisfactory completion of the project in accordance with the contract documents and any other provisions as supplied by the Engineer. Enforcement of this guarantee shall be the responsibility of the Contractor.

SECTION 7. LEGAL RELATIONS AND RESPONSIBILITY TO PUBLIC

7.01 Laws to be Observed:

The Contractor shall, at all times, observe and comply with all Federal and State laws, local laws, ordinances, and regulations which in any manner affect the conduct of the work, and all such orders or decrees as exist at the present and which may be enacted later, of legislative bodies or tribunals having legal jurisdiction or authority over the work. No plea of misunderstanding or ignorance thereof shall be considered. The Contractor shall indemnify and save harmless the County and all of its officers, agents, employees, and servants against any claims or liability arising from or based on the violation of such law, ordinance, regulation, order, or decrees whether by said Contractor, its' employees or its sub-contractors. No additional compensation shall be allowed for increased costs due to enacting of laws, ordinances, or regulations during the time of the contract.

7.02 Workmen's Compensation Insurance:

Prior to the approval of the contract by the County, the Contractor shall furnish to the County, certificates of insurance covering Workmen's Compensation or satisfactory evidence that this liability is otherwise satisfactorily addressed in accordance with the Tennessee Code Annotated, 50-6-101 et. seq., State of Tennessee.

Such insurance or other means of protection as herein provided shall remain in force until all work to be performed under the terms of the contract has been completed and accepted in accordance with the contract. It is hereby understood and agreed that the maintenance of such insurance or other protection, until acceptance of the work by the County, is a part of the contract. Failure to maintain such insurance, cancellation by the Industrial Commission of its approval of such other means of protection as might have been elected, or any other act which results in lack of protection under said "Workmen's Compensation Act" may be considered as a breach of the Contract.

7.03 Patented Devices, Material and Processes:

The Contractor shall provide suitable legal agreements with patentees or owners of any device, material, or process covered by letter, patent, or copyright for the use of such device, material or process. The agreement shall guarantee to hold harmless the County from and against all claims for infringement. Any and all costs for registration and certification to use protected devices, materials, or processes shall be included in the appropriate unit prices for the work.

It shall be the duty of the Contractor, if so demanded by the County, to furnish said County with a copy of the legal agreement with the patentee or owner, and, if such copy is not furnished when demanded, the County may, if it so elects, withhold any and all payments to the said Contractor until said legal agreement is furnished. If a suitable legal agreement with the patentee or owner is not made as required herein, the Contractor and surety shall indemnify and save harmless the County from any and all claims for infringement by reason of the use of such patented design, device, materials, or process, or any trademark or copyright in connection with the work agreed to be performed under the contract, and shall indemnify the County for any cost, expense, and damages which it may be obliged to pay by reason of any such infringement at any time during the prosecution or after the completion of the work.

7.04 Permits and Licenses:

The Contractor shall procure all required permits and licenses, pay all charges, taxes and fees, and give all notices necessary and incidental to the due and lawful prosecution of the work. No additional compensation or reimbursements shall be paid to the Contractor for procurement of such licenses, charges, taxes, or fees.

7.05 Sanitary Provisions:

The Contractor shall observe all rules and regulations of the State or local Health Departments and shall take precautions to avoid creating unsanitary conditions.

7.06 Barricades and Warning Signs:

It shall be the sole responsibility of the Contractor to provide, erect and maintain all traffic control devices used on road or street construction or maintenance work and to maintain the project in such a manner as to adequately provide for the safety of the traveling public at all times. Any detour or interruption of normal traffic patterns or flow shall be approved in advance by the Engineer or the County Traffic Engineer acting for the Engineer.

All such traffic control devices shall conform to the applicable specifications set forth in the latest edition of the Manual on Uniform Traffic Control Devices and revisions to date. Prior to placing any such devices, the Contractor shall prepare and submit to the Engineer a traffic control plan, unless such a plan has been prepared as a part of the plans and specifications.

Traffic control devices shall be installed by the Contractor for all maintenance operations, and shall be properly maintained and/or operated during times as such special conditions require.

Traffic control devices shall remain in place only as long as needed and shall be immediately removed by the Contractor thereafter.

During stage operations, there shall be in place only those devices that apply to the conditions present. Signs not applicable to existing conditions shall be removed, covered, or turned so as not to be readable by oncoming traffic.

Barricade and sign supports shall be constructed and erected in a manner acceptable to the Engineer.

Weeds, shrubbery, construction materials or equipment, spoil, etc. shall not be allowed to obscure any traffic control device.

7.07 Use of Fire Hydrants:

If the Contractor desires to use water from fire hydrants, application shall be made by the Contractor to the proper authorities and shall conform to the municipal ordinances, rules or regulations concerning their use. Metering devices shall be used unless specifically exempted by the appropriate authorities.

Access to fire hydrants shall be maintained at all times for the use of the Fire Department. No material or other obstruction shall be placed closer to a fire hydrant than permitted by municipal ordinances, rules or regulations, or within 5 feet of a fire hydrant, in the absence of such ordinances, rules or regulations. Under no circumstances shall metering devices or other connectors remain affixed to fire hydrants except when the hydrant is actually being used.

7.08 Protection and Restoration of Property:

If public, corporate or private property interferes with the work, the Contractor shall notify, in writing, the owners of such property, advising them of the nature of the interference and shall arrange to cooperate with them for the protection or disposition of such property. The Contractor shall furnish the Engineer with copies of such notifications and with copies of any agreements between the Contractor and the property owners concerning such protection or disposition.

The Contractor shall be responsible for and shall take all necessary precautions for the protection of corporate or private property, including but not limited to walls and foundations of buildings, vaults, underground structures of public utilities, underground drainage and fences contiguous to the work, of which the contract does not provide for removal. The Contractor shall protect and carefully preserve all official survey monuments, property marks, section markers, and Geological Survey Monuments, and other similar monuments until the owner or an authorized surveyor or agent has witnessed or otherwise referenced their location or relocation. The Contractor shall take reasonable precautions to avoid disturbing any archaeological and other historic remains encountered during construction. The Contractor shall notify the Engineer of the presence of any such survey or property monuments or archaeological and historic remains, as soon as they are discovered.

The Contractor shall be responsible for any and all damage to public and private property which may result from the following causes:

- 1) Neglect or misconduct
- 2) Omission of required special procedures
- 3) Failure to execute work properly
- 4) Failure to execute required work
- 5) Defective workmanship
- 6) Use of unsatisfactory materials
- 7) Any other action, whether willful or not, which results in damage.

The Contractor shall be required to repair all damage and to replace items deemed by the Engineer not able to be repaired. Upon failure of the Contractor to repair or replace damaged property within a period of 48 hours of notification by the County, the Engineer shall have the option of otherwise restoring the damaged property as necessary, and the cost thereof shall be deducted from any compensation due, or which may become due, the Contractor under the terms of the contract. The Contractor's responsibility shall continue until the Engineer's final acceptance of the work.

The Contractor shall remove all mailboxes within the limits of construction which interfere with construction operations and shall erect them at temporary locations, maintaining suitable access for the delivery of mail.

As soon as construction operations permit, the Contractor shall set the mailboxes at their permanent location. This work shall be performed as directed by the Engineer. Damaged mailboxes, posts, or other associated items shall be replaced at the Contractor's expense.

The cost of all materials required and all labor necessary to comply with the above provisions shall not be paid for separately, but shall be considered as incidental to the contract.

7.09 Responsibility for Damage Claims:

The Contractor shall indemnify, defend and hold harmless Shelby County Government including, but not limited to, the Shelby County Division of Public Works, the Engineering Department, and all officers, agents, servants or employees of Shelby County Government, from all suits, actions, or claims of any character brought because of any injuries or damages received or sustained by any person, persons or property on account of the operations of the said Contractor, its employees, agents or anyone directly or indirectly employed by it or its Sub-contractors; or on account of, or in consequence of, any neglect in safeguarding the work, or because of any act or omission, neglect, or misconduct of said Contractor; or because of any claims or amounts recovered for any infringements of patent, trademark or copyright; or from any claims or amounts arising or recovered under the "Workmen's Compensation Act" or any other law, ordinance, order or decree. It is agreed that the Contractor shall be responsible for these provisions regardless of whether or not the loss for which indemnity is sought is caused in part by the County. While not limiting the amount recoverable, an amount of money due said Contractor, under and by virtue of the contract as shall be considered necessary by the County for such purposes, may be retained until such suit(s), action(s), claim(s) for injuries or damages shall have been settled and suitable evidence to that effect furnished to the County.

7.10 Contractors Insurance - Amounts

The Contractor shall carry Commercial General Liability Insurance with limits of not less than \$1,000,000 per occurrence, \$2,000,000 general aggregate premises/operations; \$2,000,000 aggregate products/completed operations; \$1,000,000 personal and advertising injury limit; \$500,000 fire damage limit (any one fire), and \$5,000 medical expenses limit (any one person). Broad Form Endorsement is to apply. Coverage for explosion, collapse and underground hazards is to be included.

The Contractor shall carry, during the life of this contract, Commercial Automobile Liability Insurance in amounts not less than \$1,000,000 combined single limit on any motor vehicles engaged in operations within the terms of this contract.

The Contractor shall carry Workers' Compensation insurance as required by statute, including \$500,000 employer's liability.

The Contractor shall carry Railroad Protective Liability Insurance in the amount of not less than \$2,000,000 or as required by the particular Railroad Company involved with each railroad crossing within the boundaries of this contract.

The Contractor shall furnish to the County satisfactory proof of compliance with the insurance requirements, by insurers acceptable to the County, before commencing any work. Such proof shall consist of Certificates of Insurance executed by the representative insurance companies and filed with the County. Said Certificates shall contain a clause to the effect that, for the duration of the contract, the insurance coverages shall be cancelled or materially changed only after written notification thirty (30) days in advance to the County. In the event the County Engineer determines that increased limits or additional coverage is necessary for certain projects, the Contractor will be notified in writing by the County Engineer allowing for compliance with the request within fourteen (14) days.

The Contractor's liability insurance shall specifically cover, among other things, claims arising out of installation of barricades, signs, other traffic control devices, excavations, stored materials and equipment, and all other similar facilities in connection with this contract, with Shelby County shown as an additional insured.

The Contractor shall require Sub-contractors, if any, not protected under the Contractor's insurance policies, to take out and maintain insurance of the same nature and amounts as required of the Contractor. The Contractor shall provide to the County proof of insurance of all sub-contractors retained to perform work in conjunction with this contract.

7.11 Personal Liability of Public Officials:

In carrying out any of the provisions of this contract or in exercising any granted power or authority thereby, the Contractor waives any claims, and agrees that there shall be no personal liability upon the Director of Public Works, the Engineer or any of their authorized representatives, it being understood that in such matters the above mentioned act as agents and representatives of the County.

7.12 Waiver of Legal Rights:

The County shall not be precluded or estopped by a measurement, estimate, or certificate made either before or after the completion and acceptance of the work and payment therefore, from showing the true amount and character of the work performed and materials furnished by the Contractor, or from showing that any such measurement, estimate or certificate is untrue or incorrectly made, or that the work or materials do not conform in fact to the contract. The County shall not be precluded or estopped, notwithstanding any such measurement, estimate or certificate and payment in accordance therewith, from recovering from the Contractor and his sureties such damages as it may sustain by reason of the Contractor's failure to comply with the terms of the contract. Neither the acceptance by the County or any representative of the County, nor any extension of time, nor any possession taken by the County, shall operate as a waiver of any portion of the contract, any power herein reserved, or any right to damages herein provided. A waiver of any breach of the contract shall not be held to be a waiver of any other or subsequent breach.

7.13 Right-of-Way:

The County will be responsible for securing all necessary rights-of-way in advance of construction. The Contractor waives any and all claims for interference, delay or damage upon acceptance of an order to proceed with the construction with the knowledge that the rights-of-way are still encumbered.

7.14 Load Restrictions on Project Under Construction:

The operation of equipment of such weight or so loaded as to cause damage to structures or the roadway or to any other type of construction shall not be permitted. Hauling of materials over the base course or surface under construction shall be limited as directed by the Engineer. No loads shall be permitted on a concrete pavement, base or structure before the expiration of the curing period. The Contractor shall be responsible

for all damages done by any equipment including, but not limited to, that of the Contractor, sub-contractors, and materials suppliers.

SECTION 8. PROSECUTION AND PROGRESS

8.01 Subletting or Assignment of Contract:

No less than thirty percent (30%) of the total contract cost of the work shall be performed by the Contractor's own organization, thus limiting the total allowable amount of subletting to no more than seventy percent (70%) of the total contract cost of the work to be performed. All transactions, negotiations, and correspondence of the County shall be with the Contractor. The County will refer all matters regarding payments, changes, scheduling, work progress, etc. of sub-contractors to the Contractor. Sub-contractors shall be recognized only in the capacity of employees or work crews of the Contractor and shall be subject to the same requirements as to character and competence. The Contractor shall not assign, transfer, convey, sell, or otherwise dispose of the whole or any part of the contract to any person, firm, or corporation without the written consent of the County. Subletting any part of the work to be done under the contract shall not, under any circumstances, relieve the Contractor of any liabilities or obligations. Your special attention is called to Section 105, Control of Work, and Section 108, Prosecution and Progress, concerning duties of the contractor and subletting of contracts.

8.02 Progress Schedule:

During the pre-construction conference, the Contractor shall submit to the Engineer, in a form acceptable to the Engineer, a satisfactory progress schedule which shall show the proposed sequence of work, and how the Contractor proposes to complete the various items of work within the number of calendar days set up in the contract. Monthly updates of this schedule will be required if deviations have occurred. This schedule shall be used as a basis of establishing major construction operations, and for checking the progress of the work.

8.03 Prosecution of the Work:

The Contractor shall prosecute in such a manner and with such a supply of materials, equipment, and labor as is considered necessary to insure completion of the work in accordance with the progress schedule.

8.04 Limitations of Operations:

The Contractor shall conduct all work so as to create a minimum amount of inconvenience to vehicular and pedestrian traffic. At any time when, in the judgment of the Engineer, the Contractor has obstructed or closed a road or is carrying on operations on a greater portion of a road than is necessary for the proper prosecution of the work, the Engineer may require the Contractor to finish the section on which work is in progress before work is started on an additional section

Any closure of a roadway or detour shall be requested in writing and expressly approved by the County Engineer before any action is taken to divert traffic.

8.05 Character of Workmen:

The Contractor shall be responsible for efficient completion of the work and shall be responsible for control and discipline of all employees. The Contractor shall employ only competent and efficient laborers, mechanics, or artisans. Whenever, in the opinion of the Engineer, any employee is careless, incompetent, obstructs the progress of the work, acts contrary to instruction, or acts improperly, the Contractor shall, upon request of the Engineer, remove said employee from the work and shall not permit the employee to return to the project, except with the written consent of the Engineer.

8.06 Completion Dates:

The Contract Completion Date (CCD) shall be calculated on a calendar day basis, which shall consist of the number of calendar days stated in the Contract beginning with the effective date of the Engineer's order to commence work, including all Sundays, holidays and non-work days but not including the day notice is

given. All calendar days elapsing between the effective dates of any orders of the Engineer to suspend work and to resume work for suspensions not the fault of the Contractor shall be excluded from the contract time.

The contract completion time shall be a fixed calendar date and it shall be the date of final acceptance of all work as specified under the contract including any and all additions, changes, and/or deletions as directed by the Engineer.

The number of days for performance allowed in the contract as awarded is based on the original of materials as defined in Sub-Section 2.02, "Interpretation of Estimate of Quantities". If satisfactory fulfillment of the contract requires performance of work in greater quantities than those set forth in the proposal, the contract time allowed for performance shall be increased on a basis commensurate with the amount and difficulty of the added work as determined by the Engineer.

If the Contractor finds it impossible for reasons beyond his control to complete the work within the contract time as specified or as extended in accordance with the provisions of this sub-section, he may, at any time prior to the expiration of the contract time specified or as extended, make a written request to the Engineer for an extension of time setting forth therein the reasons for the request. The Contractor's plea that insufficient time was specified shall not be a valid reason for extension of time. It is expressly understood and agreed that the said Contract time described herein is a reasonable time for the completion of the work.

Extension of time will not be granted for delays caused by unsuitable weather or ground condition unless it can be shown that the weather for the construction period was unusually harsh-that the number of inclement days was above annual averages for the period. The burden of proof is on the Contractor to obtain National Weather Service or other data to support his plea.

If the Engineer finds that the work was delayed because of conditions beyond the control and without the fault of the Contractor, the Engineer may extend the time for completion by a properly executed Supplemental Agreement in such amount as the conditions justify. The extended time for completion shall be in full force and effect the same as though it were the original time for completion.

The daily time charge will cease when the Engineer has duly made final acceptance, as prescribed above in Section 5.14, "Final Inspection".

Nothing in this section shall be deemed to authorize the Contractor to incur expense on behalf of the County, or to authorize compensation to the Contractor in excess of the original contract price for the work.

8.07 Liquidated Damages:

Should the Contractor fail to complete the work within the time specified in the contract or within such extended time as may be allowed, the Contractor shall be liable to the County for all costs incurred for engineering and inspection, and such other expenses directly attributed by reason of the Contractor's failure to complete the work within the specified time, not as a penalty but as damages sustained. For each calendar day that any construction shall remain incomplete after the Contract Completion Date, the sum specified in the proposal form or as calculated from the following table, shall be deducted by the Engineer from monies due the Contractor.

<u>Amount of Original Contract Proposal</u>	<u>Amount of Liquidating Damages per Calendar Day</u>
\$0 to \$25,000	\$ 100.00
\$25,000 to \$50,000	\$ 200.00
\$50,000 to \$100,000	\$ 300.00
\$100,000 to \$200,00	\$ 500.00
over \$200,000	\$1000.00.

8.08 Termination of the Contract:

The County reserves the right to terminate the contract if the Contractor:

- (1) Fails to begin construction in accordance with the terms of the order to begin work.
- (2) Fails to furnish proper materials, or to utilize proper construction methods and equipment.
- (3) Fails to remove and replace portions of the work which are found to be unsatisfactory.
- (4) Discontinues prosecution of the work without the consent of the Engineer, or fails to resume operations at any time the Engineer directs.
- (5) Fails to maintain traffic in a safe and efficient manner, or to maintain completed portions of the work effectively.
- (6) Fails to maintain a rate of construction progress that, in the opinion of the Engineer, is sufficient to assure completion of the work within the specified time.
- (7) Fails, in any degree, to maintain the same financial responsibility on the basis of which the Contractor was prequalified for submitting the proposal for the work and of which award of this contract was made.
- (8) Fails or refuses to follow the proper orders of the Engineer.

Under any circumstances, the Engineer will serve written notice of intent to terminate the contract to the Contractor and the surety for reasons that will be set forth therein. If, within fifteen days of delivery of such notice, the Contractor and the surety, or the surety have not taken sufficient steps to correct the circumstance(s) at fault to the satisfaction of the Engineer, the County may, in its absolute discretion, order the contract terminated.

The County may then appropriate or use any or all stockpiled materials and equipment on the ground or job site as may be suitable in accordance with Section 9.03, "Stockpiled Material and Equipment". The County may, at its' sole discretion, enter into an agreement for the completion of said contract according to the terms and provisions thereof, or use such other methods as in the opinion of the Engineer will be required for the completion of said contract in an acceptable manner.

In the event of termination, the Contractor shall be paid for work satisfactorily completed through the effective date of termination. All costs and charges incurred by the County, together with the cost of completing the work under contract, shall be deducted from any monies due or which may become due said Contractor. If such expense exceeds the sum which would have been payable under the contract, the Contractor and the Surety shall be liable and shall pay to the County the amount of such excess.

SECTION 9. MEASUREMENT AND PAYMENT

9.01 Payment to Contractor:

The County will pay the Contractor for satisfactory work completed. Such payment will be based upon monthly estimates prepared by the Engineer in accordance with procedures set forth as herein provided.

9.02 Partial Payments:

Payments to the Contractor will be estimated by the Engineer based upon statements consisting of the Inspector's Daily Progress Reports, itemized job delivery or materials tickets, or other documents showing the quantity of work completed or materials supplied. These statements shall be prepared in a format satisfactory to the Engineer. Such estimates shall be approximate only and may not necessarily be based on detailed measurement. Lump sum items shall be estimated in accordance with the percentage of completion of the lump sum item. Following approval by the Engineer, monthly progress payments shall be made to the Contractor in an amount equal to ninety (90%) of the earned amount, said earned amount being defined as the portion of the project work completed in accordance with the contract as determined by the Engineer. Upon satisfactory completion of seventy (70%) percent of the work, the Engineer may, at his discretion, reduce the retainage to five (5%) percent. Progress payments shall not be deemed as final acceptance of the

work performed by the Contractor. The retainage shall be retained until completion of the entire work to the satisfaction of the Engineer.

9.03 Stockpiled Material and Equipment:

An estimate may, at the discretion of the County and upon presentation of receipted bills and freight bills, be made for payment of the value of acceptable materials and equipment delivered and suitably stored on the work site and not used at the time of such estimate. The Engineer will determine items eligible for partial payment upon delivery. Payment will be made as a percentage of either the unit price of the item or the invoice price of the material. From the value of such material or equipment estimate, there will be deducted a retainage of up to ten percent (10%) as provided in 9.02, "Partial Payments". Such materials and equipment, when so paid for by the County, shall become the property of the County, and, in case of default on the part of the Contractor, the County may use, or cause to be used, such materials in the construction of the work provided in the contract. The amount thus paid by the County shall be deducted from estimates due the Contractor as the materials or equipment are used in the work.

9.04 Measurement of Quantities:

All work completed under the contract will be measured by the Engineer according to United States Measures. Quantities will be calculated from measurements made in accordance with requirements set forth under the basis of payment for each item.

9.05 Scope of Payment:

The Contractor shall receive and accept the compensation as herein provided in full payment for furnishing all materials, labor, tools, and equipment; for performing all work contemplated and embraced under the contract; for all loss or damage arising out of the nature of the work or from the action of the elements; for any unforeseen difficulties or obstructions which may arise or be encountered during the prosecution of the work until its final acceptance by the Engineer; for all expense incurred by or in consequence of suspension or discontinuance of such prosecution of the work herein specified; for any infringement of patents, trademarks or copyrights; and for completing the work in an acceptable manner according to the plans and specifications.

The payment of any current estimate prior to final acceptance of the work by the County shall not constitute an acknowledgment of the acceptance of the work and shall not be deemed as final acceptance of any work performed by the Contractor. The payment of any estimate shall in no way abrogate or affect the obligation of the Contractor to repair, correct, or replace any defects or imperfections in the construction due to quality of materials or workmanship. The Contractor shall, regardless of any estimates paid, continue to be responsible for any and all damage discovered on or before final inspection and acceptance of the work. The Engineer will be the sole judge of any and all defects, imperfections, or damage, and the Contractor shall be liable to the County for failure to correct the same.

9.06 Increased or Decreased Quantities:

In the event of an increase or decrease in any item or work as given in the proposal, payment will be made according to the revised quantities as calculated by the Engineer. In no case, however, shall the actual pay quantities exceed that which is actually used to perform the work.

9.07 Payment for Extra Work-Unit Price Contract:

Extra work will be paid for under the following classifications:

(1) Lump Sum - This classification shall include all qualified extra work on which unit prices are not practical, and on which a fair price can be established agreeable to the Engineer and the Contractor in accordance with the provisions of Section 4.03, above or on proposals from not less than two sub-contractors qualified and acceptable to do the particular work. The contractor will be allowed reasonable mark-ups for overhead and profit on subcontract work.

Payment shall be made only after the Contractor has submitted a bill to the County and this bill has been approved by the Engineer.

(2) Unit Price - This classification shall include all qualified extra work that can be broken down or divided into units or work similar, in the opinion of the Engineer, to units on which bid prices have been received in this contract or on units based on a fair price agreeable to the Engineer and the Contractor in accordance with the provisions of Section 4.03, above. Work shall not be paid from over-runs or under-runs of unrelated quantities shown on the bid items of the proposal sheet in this contract.

Payment for this classification shall not include any markup or percentage increase if the contract unit price is used as the contract unit price already contains such increases. Payment shall be made only after the Contractor has submitted a bill to the County and this bill has been approved by the Engineer.

(3) Force Account - This classification shall include all qualified work that cannot be identified in either lump sum or unit price classifications.

The Contractor is warned that payment for this classification of extra work cannot be paid unless the following requirements have been fulfilled:

The Engineer's representative or inspector shall be furnished with a book or pad titled, "FORCE ACCOUNT", on which a complete record shall be recorded in triplicate. This record shall show the date and identity of the project, the Contractor, location, and shall describe the work to be done. All labor, material and equipment essential to the completion of the work shall be recorded, showing the actual time or quantity used. The Contractor's supervision of labor shall be limited to a foreman, and the time of said foreman shall be recorded only during the actual supervision of the laborers. The inspector and the Contractor's representative shall both sign all three copies of this record. Immediately after the completion of this record, the original copy shall be submitted to the County, the first carbon shall be retained by the Contractor, and the second carbon shall be retained in the record book for the inspector's job record.

Before the end of the pay period, the Contractor shall submit a bill to the County for the force account described on the inspector's report. The Contractor's bill shall show the rate of pay on labor and foremen (if used), the unit price or lump sum cost of the material, and the size and rate of rental on the equipment. The rate on the equipment shall conform to those included in the monthly rates of the Rental Rate Blue Book for Construction Equipment published by Dataquest, Incorporated, latest edition. Hourly rates shall be obtained by dividing the monthly rate by 176. The weekly, daily, or hourly rates published in the Blue Book shall not be used. No allowances or pay shall be allowed for fuel, lubricants, repairs, transportation, or any other incidental costs.

To the net total of labor, material and equipment costs, the Contractor will be allowed to add eighteen percent (18%) of the labor cost only. This addition is estimated to cover the total average mandatory labor costs.

The Contractor shall furnish the County with a certified copy of the month's payroll and material billing to support the prices shown on this bill.

Before payment is made, this bill shall be approved by the Engineer.

In the event the accumulated cost of extra work on this contract exceeds the allowable on the proposal sheet, all excess payment due the Contractor for extra work will be deferred until the final estimate.

9.08 Payment for Items Omitted When Partially Completed:

Should the County cancel or alter any portion of the contract which results in the elimination or noncompletion of any portions of the work partially completed, the Contractor shall be allowed a fair and equitable amount covering all items of work incurred prior to the date of cancellation, alteration, or suspension of such work. Should the County cancel or alter any portion of the contract which results in a total decrease of not more than 25 percent of the original contract price, the Contractor shall not be allowed any extra compensation other than the unit price extensions of the work actually completed. When such elimination or noncompletion involves a net decrease in the amount of the contract of more than twenty five percent (25%) of the original contract price, a supplemental agreement between the Contractor and the County shall be required.

Acceptable materials ordered by the Contractor or delivered on the work prior to the date of its cancellation, alteration, or suspension by the Engineer shall be purchased from the Contractor by the County at actual cost and shall thereupon become the property of the County, or, at the option of the Engineer, the unused acceptable material shall remain the property of the Contractor and such shall be paid the actual cost including freight, unloading, and hauling costs less the actual salvage value as determined by the Engineer. Materials ordered after the date of cancellation, alteration, or suspension shall not be eligible for any compensation and shall remain the Contractor's property.

9.09 As-Built Drawings:

The Contractor shall, prior to request for final payment, provide the Engineer one set of the construction plans amended to indicate the actual improvements constructed during the term of this Contract. The "as-built" drawings will depict any changes made in plan or elevation and will be sealed by a Professional Engineer licensed by the State of Tennessee and acceptable to the Engineer. The Engineer will review these plans within thirty (30) days of receipt to determine whether any corrections or re-work will be required prior to final payment and release of retainage.

9.10 Acceptance and Final Payment:

Whenever the improvement(s) provided for, and all conditions called for, by the contract have been completely performed and/or met on the part of the Contractor, and all parts of the improvement have been approved by the Engineer and accepted by the County, a final estimate showing the value of the work will be prepared by the Engineer as soon as the necessary measurements and computations can be made. All prior estimates upon which approximate payments have been made shall be corrected in the final payment. The amount of this estimate less any sums that have been deducted or retained under the provisions of the contract, will be paid the Contractor as soon as practicable after the final acceptance and the period of necessary advertisement has expired; provided the Contractor has furnished the County satisfactory evidence that all sums of money due for labor, materials, equipment, fixtures, or machinery furnished for the purpose of such improvements have been paid or that the person or persons to whom the same may be due have consented to such final payment.

The acceptance by the Contractor of the final payment shall constitute a release and waiver of any and all rights and privileges under the terms of the contract; further, the acceptance by the Contractor of final payment shall relieve the County from any and all claims or liabilities from any person or entity, regardless of where situated, for anything done or furnished to the work or in connection with the work or any act or neglect on the part of the County relating to or connected with the contract.

9.11 Latent Defects:

Neither the final payment on this contract nor any provision in these specifications shall relieve the Contractor of the responsibility of faulty materials or faulty workmanship which may show up within the extent and period provided by law or within the guarantee period of one year from final acceptance of the work performed under this contract, whichever is greater, nor of the responsibility of remedying such faulty workmanship, materials and/or equipment.

9.12 Audit and Inspection of Records:

The Contractor agrees to maintain books, records and accounts pertaining to the contracted improvements for a period of not less than three (3) years from the date of final payment, and to make these records available to authorized representatives of the County. Should State or Federal funds be used in the project, Contractor agrees to make these records available to the authorized representatives of the State of Tennessee or the Federal Government as necessary.

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