HIGHWAY FACTORS GROUP CHAIRMAN'S FACTUAL REPORT

Highway Attachment 1, CNN 306 Construction Contract

Chattanooga, Tennessee

HWY15MH009

(262 pages)

STATE OF TENNESSEE

DEPARTMENT OF TRANSPORTATION

PROPOSAL CONTRACT

FOR THE CONSTRUCTION OF

Contract No. CNN306

BRADLEY AND HAMILTON COUNTIES

Project No. NH-I-75-1(138), 06001-8178-44 (PIN 104529.01), 33005-8178-44 (PIN 104529.01)
The resurfacing using OGFC on I-75 from north of the weigh station exit in Hamilton County (L.M. 12.78) to north of Bancroft Road in Bradley County (L.M. 2.98).

Project Length - 5.820 miles
Completion Time - On or before 7/31/2015 (See Special Provision 108B)

AT AN ESTIMATED COST OF $_____

By _____

City, St. _____

Surety _____

DT-1390-V

(June 18, 2012)
(December 12, 2012)
(June 14, 2013)

STATE OF TENNESSEE

DEPARTMENT OF TRANSPORTATION

INSTRUCTIONS TO BIDDERS

BIDS TO BE RECEIVED

DECEMBER 5, 2014

Bids for the construction or maintenance of the following projects will be received via the Internet until 10:00 A.M. December 5, 2014, opened publicly in the Construction Division, Suite 700, James K. Polk Office Building, Nashville, Tennessee, 37243-0326 and posted to the Tennessee Department of Transportation Construction Division website (www.tdot.state.tn.us/construction/bid_lettings.htm) at that hour.

The proposed construction shall be performed in accordance with the Standard Specifications for Road and Bridge Construction of the Tennessee Department of Transportation, dated March 1, 2006, which are incorporated herein by reference and made a part hereof. In addition, only the Special Provisions contained within the applicable Contract Proposal will be considered binding. Any reference to the Standard Specifications dated prior to March 1, 2006 shall be disregarded. In addition, any reference to any Special Provision not contained within the applicable Contract Proposal shall be disregarded. All questions related to the Contract Proposal, Plans, Specifications or Special Provisions shall be directed to the Headquarters Construction Office (615-741-2414). Information received from other offices of the Tennessee Department of Transportation is strictly advisory.

IMPORTANT NOTICE TO BIDDERS:

Prospective bidders should read the following instructions carefully before submitting their bids. Special attention is called to the regulations of the Tennessee Department of Transportation (Department) that total bids, rather than unit prices, will be posted. Proposals shall be rejected as being irregular if they fail to contain a unit price for each item listed.

After a bidder has submitted a bid via Internet Bidding, he can withdraw it using the electronic bidding program up until the time set for the opening of bids.

On all projects which are financed in whole or in part by funds received through Federal agencies and other third parties, the awarding of contracts by the Department will be subject to approval by the party or parties through which funds are received. The Department reserves the right to reject any bid proposal which is not acceptable to any such third party set out above, although such bid proposal would otherwise qualify as the lowest and best bid under the Standard Specifications of the Department. It shall be the responsibility of the bidder to determine which projects are so financed in part by third parties, such information being available upon request from the Department.

The awarding of the contract or rejection of all proposals will be made within thirty (30) days after the bid opening. Upon award, a detailed letter of instructions will be forwarded along with appropriate documents to the low bidder.

The Tennessee Department of Transportation hereby notifies all bidders, that it will affirmatively insure that in any contract entered into pursuant to this advertisement,

disadvantaged business enterprises will be afforded full opportunity to submit bids in response to this invitation and will not be discriminated against on the basis of age, race, color, religion, national origin, sex or disability in consideration for an award.

The Tennessee Department of Transportation is an equal opportunity affirmative action employer, drug-free, with policies of nondiscrimination on the basis of race, sex, religion, color, national or ethnic origin, age, disability, or military service. For more information call: (615) 741-5996.

PREQUALIFICATION OF BIDDERS:

Each prospective bidder and subcontractor will be required to file a document entitled "Prequalification Questionnaire." The foregoing shall be filed on a form provided by the Department. The form must be filled out completely, and the truth and accuracy of the information provided must be certified by a sworn affidavit signed by an officer, partner, owner or other authorized representative of the applicant who has authority to sign contracts or other legal documents on behalf of the applicant. A prospective bidder must be prequalified by and in good standing with the Department prior to being given authorization to bid. A prospective subcontractor must be prequalified by and in good standing with the Department prior to being approved as a subcontractor. Each prospective bidder or subcontractor shall notify the Department if there is any subsequent change in the name, organization or contact information provided.

Prospective bidders' "Prequalification Questionnaire" shall be filed with the Department at least fourteen (14) days prior to the date of opening bids on any letting in which the applicant intends to submit a bid to the Department, or at least fourteen (14) days prior to the date on which the applicant requests approval as a subcontractor under a contract awarded by the Department. Bidders intending to submit proposals consistently shall complete and submit the prequalification application annually; however, this document may be changed during such period upon submission of additional favorable reports or upon receipt by the Department of substantiated evidence of unsatisfactory performance. The Department reserves the right to request additional information and documentation to clarify and/or verify any information submitted in an applicant's prequalification application.

The prequalification form can be found at the web address
http://www.tdot.state.tn.us/construction

PRIME CONTRACTOR LICENSING REQUIRMENTS

The Department shall require that all prime contractors, except mowing and litter removal contractors, are to be licensed with the State of Tennessee, Department of Commerce and Insurance (TDCI), Board for Licensing Contractors (BLC). The prime contractor must be licensed in the general classification (e.g. Heavy Construction (HC), Highway, Railroad, Airport Construction (HRA), Specialty (S), Municipal and Utility Construction (MU), or Electrical Contracting (CE)) for the type of work in the project which they will perform. Bidders may submit a proposal without having a license and will be considered for award for twenty-one (21) days after proposals are opened. If the Bidder does not have a license with the TDCI, on or before twenty-one (21) days after proposals are opened, the Bidder will be considered non-responsive and their proposal will be rejected.

SECRETARY OF STATE REQUIREMENTS

Title 48 of Tenn. Code Ann. requires all contractors and subcontractors that are domestic or foreign Corporations, Limited Liability Companies, Limited Partnerships, or Limited Liability Partnerships to be in good standing with the Secretary of State. This includes being duly incorporated, authorized to transact business, and/or in compliance with other requirements as

detailed by the Secretary of State. Please contact the Secretary of State should you have any questions at (615) 741-2286 or visit http://www.tn.gov/sos/bus_svc/index.htm.

The Department will not execute any contracts or approve subcontracts with contractors that are domestic or foreign Corporations, Limited Liability Companies, Limited Partnerships, or Limited Liability Partnerships, who are not in good standing with the Secretary of State (i.e. have a valid Certificate of Existence/Authorization). If a Bidder is not in good standing with the Secretary of State (i.e. have a valid Certificate of Existence/Authorization) on or before twenty-one (21) days after proposals are opened then the Bidder will be considered non-responsive and their bid will be rejected.

ISSUANCE OF BIDDING DOCUMENTS

This Department is on a cash basis for sales of Plans, bid authorization, Standard Specifications, Standard Drawings, Standard Drawing Books and Tabulations of Bids. Requests for documents must be accompanied by cash, check, or they may be mailed to the buyer C.O.D.

TDOT no longer issues hard copy Proposal Contracts and will only accept Internet bids and bid bonds. The Internet bid and electronic bid bond executed by the Contractor and their Surety will be considered as a complete bid and will be printed at the time of the letting. All requests for authorization to bid via the Internet using Bid Express must be submitted on the Bidding Authorization Form. This form is available at the web address http://www.tdot.state.tn.us/construction. Adobe Reader 8.0 or newer is needed to use this form. This form must be complete before authorization to bid is given. Bidding authorization will be obtainable until 4:00 P.M. the day before the letting. A charge of $25.00 will be made for each authorized Proposal. Any bid submitted via the Internet that is not authorized will not be considered.

Addenda to the Proposal and amendments to the electronic bidding file will be posted on the Bid Express website. Addenda will be acknowledged by all bidders through the electronic bidding program. It is the bidder's responsibility to monitor the Bid Express website for Addenda until 4:00 P.M. the day before the letting. The bidder will not be notified by the Department unless Addenda are issued after 4:00 P.M. the day before the letting. Failure to acknowledge receipt of Addendum Letters or to apply any applicable amendments to the electronic bidding file is grounds for rejection.

Standard Specifications for Road and Bridge Construction, dated March 1, 2006, and Supplemental Specifications, are available for review and printing at the following site http://www.tdot.state.tn.us/construction/specs.htm. The charge for Plans and/or Cross-sections can be found on the Plans Order form on the TDOT Construction website. This charge will be applicable before the letting and for three months after the letting. Plans ordered after the three month period will be furnished at $2.00 per sheet. Individual Plan sheets and individual Standard Drawings will be furnished at $2.00 per sheet. Tabulations of bids will be furnished at $0.50 per sheet. Standard Drawing Books will be furnished at $100.00 per book.

A sales tax of 9.25% will be added to the above charges when there is in-state delivery. There will be a minimum charge of $2.00 on any purchase. All documents will be furnished without refund and transmitted at your risk.

When two or more contractors wish to bid together in a joint venture, each contractor will be required to make a written request for such a proposal to the Construction Division. This request shall be signed by an authorized signatory of each firm.

Requests for joint venture proposals may be made in person or by telephone. However, the proposal for said joint venture will not be issued until the request in writing, as set forth above, is received by the Construction Division.

ALTERNATE BID ITEMS

There will be projects that will have numerous alternates. The Contractor will be required to bid on only one alternate for each construction item. The proper procedure for entering alternate bids is to enter prices for the intended alternate item(s) of construction and leave the undesired alternate item(s) of construction blank.

SUBCONTRACTOR BIDDERS LIST

The apparent low bidder for each project must provide a list of all subcontractors who provided a quote to perform work. The list shall be provided electronically on the TDOT form "Certification Regarding Subcontractor Bid Quotes" (Bidders List). The apparent low bidder shall submit this form before the close of business (4:30 PM, Central Time) five (5) calendar days after the date on which bids are required to be submitted (e.g., if bids are required to be submitted on a Friday, then the completed form is due by 4:30 PM on the following Wednesday). Emergency contracts will not require a bidders list. Failure to complete and submit this form within the time period required may result in the rejection of the bid.

BID GUARANTY

Each bid must be accompanied by an electronic bid bond or a Cashier's or Certified Check made payable to the Department of Transportation or Irrevocable Letter of Credit naming the Department as beneficiary (for Mowing and Litter projects only) in an amount equaling not less than five percent (5%) of the amount bid.

If the bidder's bond is offered as guaranty, the bond must be submitted electronically via Internet Bidding, must be made by a surety company qualified and authorized to transact business in the State of Tennessee and must be acceptable to the Department.

If a check is offered as guaranty, the check must be in the Department's possession by 10:00 A.M. the day of the bid opening and must be attached to the signed Proposal Guarantee Form, which is available at the web address http://www.tdot.state.tn.us/construction. The check of the successful bidder will be cashable at the discretion of the Commissioner, pending the satisfactory execution and acceptance of the contract and the contract bond.

Mowing and Litter Projects Only: If an Irrevocable Letter of Credit is offered as guaranty, the Proposal Guaranty Irrevocable Letter of Credit Form must be signed by an authorized official of an authorized financial institution and in the Department's possession by 10:00 A.M. the day of the bid opening. The form is available at the web address http://www.tdot.state.tn.us/construction.

John Schroer
Commissioner

The following information applies to Federal-Aid construction projects:

NOTICE TO ALL BIDDERS

To report bid rigging activities call:

1-800-424-9071

The U.S. Department of Transportation (DOT) operates the above toll-free "hotline" Monday through Friday, 8:00 a.m. to 5:00 p.m. eastern time. Anyone with knowledge of possible

bid rigging, bidder collusion, or other fraudulent activities should use the "hotline" to report such activities.

The "hotline" is part of the DOT's continuing effort to identify and investigate highway construction contract fraud and abuse and is operated under the direction of the DOT Inspector General. All information will be treated confidentially and caller anonymity will be respected.

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

SHEET 1 of 2
PROJECT NO. 06001-8178-44,33005-8178-44
(REV.)
COUNTIES BRADLEY,& HAMILTON

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

Contract Payment and Performance Bond

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 Construction Division, upon request.

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

(Rev. 05-05-10) March 1, 2006
(Rev. 11-01-10)
(Rev. 12-13-10)
(Rev. 10-31-11)
(Rev. 06-25-12)
(Rev. 08-06-12)
(Rev. 10-19-12)
(Rev. 06-12-13)
(Rev. 09-03-13)
(Rev. 12-09-13)
(Rev. 09-10-14)

Supplemental Specifications - Section 100

of the

Standard Specifications for Road and Bridge Construction

March 1, 2006

Subsection 101.13, Second paragraph, first sentence, **Delete** "Revisions and Additions."

Subsection 101, Add the following definition

> **"Amendment.** A revision to the electronic bid file which may include adjusting a quantity, adding, deleting, or revising a pay item(s).

Subsection 101.47, Second sentence, **Replace** "**Revisions and Additions**" with "**Supplemental Specifications**"

Subsection 101.57, Delete the entire paragraph and replace with the following

"A company authorized to guarantee a bidder's proposal and a contractor's performance and payment obligations under a contract and which is authorized to do business in the State of Tennessee."

Subsection 102.01, Replace the entire subsection with the following:

102.01-Prequalification Questionnaire and Competency of Bidders. Each prospective bidder and subcontractor will be required to file a document entitled "Prequalification Questionnaire." The foregoing shall be filed on a form provided by the Department. The form must be filled out completely, and the truth and accuracy of the information provided must be certified by a sworn affidavit signed by an officer, partner, owner or other authorized representative of the applicant who has authority to sign contracts or other legal documents on behalf of the applicant. A prospective bidder must be prequalified by and in good standing with the Department prior to the issuance of a proposal form; however this standing does not prohibit any person from requesting or obtaining a void proposal form for any purpose other than submitting a proposal to the Department. A prospective subcontractor must be prequalified by and in good standing with the

Department prior to being approved as a subcontractor. Each prospective bidder or subcontractor shall notify the Department if there is any subsequent change in the name, organization or contact information provided.

Prospective bidders' "Prequalification Questionnaire" shall be filed with the Department at least fourteen (14) days prior to the date of opening bids on any letting in which the applicant intends to submit a bid to the Department, or at least fourteen (14) days prior to the date on which the applicant requests approval as a subcontractor under a contract awarded by the Department. Bidders intending to submit proposals consistently shall complete and submit the prequalification application annually; however, this document may be changed during such period upon submission of additional favorable reports or upon receipt by the Department of substantiated evidence of unsatisfactory performance. The Department reserves the right to request additional information and documentation to clarify and/or verify any information submitted in an applicant's prequalification application.

Prospective subcontractors will be required to pre-qualify prior to approval of the subcontracts by the Department and must also submit a prequalification application annually.

The Department reserves the right to refuse to issue a proposal form when a bidder is in default or delinquent for any of the following reasons:

a) When a "Prequalification Questionnaire" has not been filed with and examined by the Department or when the bidder, in the opinion of the Commissioner, is not qualified.

b) Default of existing contract (s).

c) When a bidder has an existing incomplete contract (s) with the Department which is behind schedule to the extent that it may hinder or prevent prompt completion of any additional contract (s).

d) When a bidder has been suspended, debarred, or otherwise excluded under the Department's rules governing contractor debarment and suspension, Chapter 1680-5-1, or under applicable Federal rules governing the suspension and debarment of contractors.

Subsection 102.02 Contents of Proposal Forms, Revise entire subsection to the following:

102.02-Contents of Proposal Forms. Upon request, the Department will furnish the Bidder an electronic proposal form which will contain an "Instructions to Bidders" form, Supplemental Specifications, Special Provisions, and proposal guaranty form. The proposal form will state the location and description of the contemplated construction. The proposal form will state the time in which the Work must be completed, the amount of the Proposal Guaranty, and the date, time and place for the opening of Proposals. The Plans and Specifications are as much a part of the Proposal form as if they were bound therein. All of the documents that are bound therein are part of the Proposal.

The prospective bidder will be required to pay the Department the sum stated in the Instructions to Bidders for each electronic proposal form. Plans will be available for the sum stated in the notice to Contractors.

Subsection 102.03 Interpretation of Quantities in Bid Schedule, Revise entire subsection to the following:

102.03-Interpretation of Quantities in Bid Schedule. The quantities appearing on the electronic bidding file are approximate only and are prepared for the comparison of bids and award of Contract. The Department does not guarantee or assume any responsibility that

quantities indicated on the Plans or given in the electronic bidding file will hold in the construction of the project and the Contractor shall not plead deception or misunderstanding because of variation from these quantities or of variation from the location, character or any other conditions pertaining thereto. Payment to the Contractor will be made only for the actual quantities of work performed and accepted, and materials furnished in accordance with the Contract. The schedule of quantities of work to be done and materials to be furnished may be increased, decreased, or omitted as hereinafter provided under **Subsection 104.02.**

Subsection 102.05 Preparations of Proposals, Revise entire subsection to the following:

102.05-Preparation of Proposals. A document entitled "Instructions to Bidders" is bound into the electronic proposal form. The proposal form shall be electronically signed in exact accordance with these instructions using the electronic bidding file furnished by the Department. The proposal guaranty form shall be handled similarly. The completed electronic bidding file, inclusive of the proposal form as described in **Subsection 102.02** and the bid prices described below, shall then be submitted to the Department in exact accordance with the applicable part of these instructions.

The electronic bidding file contains the contract bid items and associated estimated quantities. The following stipulations shall apply to electronic bidding:

(a) It is the bidder's responsibility to compare the bid quantities indicated on the plans to those contained on the electronic bidding file to ensure they are the same. Any discrepancies are to be called to the Department's attention immediately.

(b) Any revisions to the Contract Proposal regarding bid items or quantities will be accompanied by an amendment to the electronic bidding file with the revision date indicated. The amended electronic bidding file is to be utilized in the formulation of the bid.

Some proposals may contain numerous alternates. The Contractor will be required to bid on only 1 alternate for each construction item unless otherwise specified. The proper procedure for entering alternate bids is to enter prices for the intended alternate item(s) of construction and leave the undesired alternate item(s) of construction blank. The electronic bidding program allows only for 1 alternate to be bid. If prices are entered for more than 1 alternate, the electronic bidding program will not tabulate the total. Instructions for electronic bidding are available from the Headquarters Construction office and the method of entering alternates is explained therein.

The electronic bidding program will perform all extensions of the estimated quantities and unit or lump sum prices, calculate the total bid and allow the printing of a complete set of bid item sheets with appropriate subtotals and grand total bid price.

Subsection 102.06 Delivery of Proposals, Revise entire subsection to the following**:**

102.06-Delivery of Proposals. Each Proposal must be submitted via the Internet using the electronic bidding program.

No proposal will be considered or accepted which has not been received by the Department previous to the hour of the date and at the place set forth for the opening thereof in the Advertisement or Instruction to Bidders.

Subsection 102.07 Withdrawal of Proposal, Revise entire subsection to the following:

102.07-Withdrawal of Proposal. Any Bidder may withdraw his Proposal through the electronic bidding program prior to the hour of bid opening as indicated in the Advertisement for Bids and in the Instruction to Bidders

Subsection 102.08 Public Opening of Proposals, Revise entire subsection to the following:

102.08-Public Opening of Proposals. Proposals will be opened and either read publicly or bid totals will be furnished and posted on the date, time, and place indicated in the Advertisement for Bids and Instruction to Bidders. Bidders, authorized Agents, and interested parties are invited to be present.

Subsection 102.09 Rejection of Proposals, Revise entire subsection to the following:

102.09-Rejection of Proposals. Proposals will not be rejected if they condition their consideration upon the elimination of other proposals submitted by the same bidder, provided that any selection of awards will be made by the Department. A Bidder may tie the acceptance or rejection of 2 or more of his proposals on the condition that either all of his proposals are accepted or that they are all rejected, in which case his bids must be the lowest responsible bid on each project before they will be considered.

Proposals may be rejected by the Commissioner if any of the unit prices contained therein are obviously unbalanced, either excessive or below the reasonable cost analysis value.

Proposals will be rejected as being irregular if they are not prepared on the prescribed forms; if they show any omissions, alterations of form, additions, or conditions not called for, unauthorized alternate bids, or irregularities of any kind; or if they fail to contain a unit price for each item listed. In the case of authorized alternate items, a unit price on only 1 of the alternates will be required, unless otherwise specified in the Contract.

Proposals will be rejected as irregular if they are not electronically signed by an authorized representative of the bidder. The electronic signature on the electronic bidding file serves as signatures for the Proposal form, Proposal Certification form and the Proposal Bond form, if applicable. If the bidder elects to submit the Proposal Guarantee, the Proposal Guarantee Form must be signed by written signature and in the possession of the Department prior to the formal opening of the Proposal. The Agent or Attorney-in-Fact representing a Surety Company shall electronically sign the electronic Proposal Bond, if applicable. An original, dated and valid Power of Attorney for the Attorney-in-Fact must accompany the Proposal and the Contract. The accompanying Power of Attorney must be dated, and the date must be the exact same date as the date on the Proposal Guaranty Bond. The Proposal and the Proposal Guarantee Bond, including the attached Power of Attorney shall be valid and binding for 60 days subsequent to the date of opening bids. As an alternative, Surety Companies may submit an original, unnumbered Power of Attorney suitable for photocopying to the Department. Surety Companies choosing this alternative will be required to furnish the Department with a letter on the company letterhead and signed by an officer of the company authorized to appoint Attorneys-in-fact. A draft copy of this letter is available from the Department upon request.

Proposals will be rejected as irregular when submitted by a Bidder who has not qualified as required by the Commissioner under the authority given him by Tennessee Code Annotated.

All prime Contractors, except mowing and litter removal Contractors, must be licensed with the Tennessee Department of Commerce and Insurance (TDCI), Board for Licensing Contractors (BLC). The Contractor must be licensed in the general classification (e.g. Heavy Construction (HC), Highway, Railroad, Airport Construction (HRA), Specialty (S), Municipal and Utility

Construction (MU), or Electrical Contracting (CE)) for the type of work in the project which they will perform. A Proposal submitted by a Bidder will be considered for Award for twenty-one (21) days after the Proposals are opened. If the Bidder does not have a license with the TDCI, on or before twenty-one (21) days after Proposals are opened, the Bidder will be considered non-responsive and their Proposal will be rejected as irregular. The next lowest responsible Bidder would then be considered for Award. If the next lowest responsible Bidder does not have a license on or before the twenty-one (21) days after the Proposals are opened, they also would be considered non-responsive, and the subsequent Bidder will then be considered.

Bidders that are domestic or foreign Corporations, Limited Liability Companies, Limited Partnerships, or Limited Liability Partnerships, must be in good standing with the Secretary of State (i.e. have a valid Certificate of Existence/Authorization). If a Bidder is not in good standing with the Secretary of State (i.e. have a valid Certificate of Existence/Authorization) on or before twenty-one (21) days after Proposals are opened then the Bidder will be considered non-responsive and their Proposal will be rejected.

Reasonable grounds for believing that any Bidder is interested in more than 1 Proposal on the same project or that there has been collusion among the Bidders will cause a rejection of all Proposals in which the Bidders involved are interested.

A Proposal will be rejected, at the discretion of the Commissioner, if a Bidder or any member of the firm, partnership, or corporation represented in his Proposal is related either by blood or marriage within the fourth degree, computing by the civil law, to any member of the Department, or if any member of the Department will have any financial interest in the Contract.

The right is reserved to reject a Proposal from a Bidder who has not paid or satisfactorily settled all legal debts due on former contracts in force at the time of the letting.

All Proposals will be rejected that do not contain the Proposal Guaranty of the character and amount indicated in the proposal form.

The apparent low bidder on each project is required to complete and submit the TDOT form "Certification Regarding Subcontractor Bid Quotes" (Bidders List) electronically. The apparent low bidder shall submit this form before the close of business (4:30 PM, Central Time) five (5) calendar days after the date on which bids are required to be submitted. Emergency contracts will not require a bidders list. Failure to complete and submit this form within the time period may result in the rejection of the bid.

Until the execution and approval of the Contract by the Department, the right is reserved to reject any and all Proposals and to waive technical errors.

Subsection 103.01 Consideration of Proposals, Revise entire subsection to the following:

103.01-Consideration of Proposals. The Internet bid shall be recognized as the only official bid.

After the Proposals are opened and read, they will be compared based on the summation of the products of the unit bid prices and the approximate quantities. The results of such comparisons will be made available to the public.

The right is reserved to reject any or all Proposals, to waive technicalities or to advertise for new Proposals, if in the judgment of the awarding authority, the best interest of the Department will be promoted thereby.

Subsection 103.04, Award of Contract, add the following as the second paragraph:

TDOT will only award a contract to a contractor that is licensed with the State of Tennessee, except if the contract is for mowing or mowing and litter removal, Contractors for mowing or mowing and liter removal type contracts must be registered with the Secretary of State, if applicable, before a project will be awarded.

Section 104-SCOPE OF WORK, Add the following to the Table of Contents **"104.02-Alterations in Plans or in Character of Construction."**

Subsection 104.02, Significant Changes in the Character of Work, (4), **Revise** subsection to the following:

4. An adjustment of the contract terms in accordance with number 2 above will be made only if the Engineer orders, in writing, an alteration in the work or in the quantities that significantly change the character of work. 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 or decreased by more than 25 percent of the original contract quantity (adjustments shall apply only to that portion in excess of 125 percent of original contract quantity, or in case of a decrease, to the actual quantity performed).

The above provides for adjustments resulting from formal change orders by the Engineer, in writing. Either party may initiate an adjustment and both must be in agreement before the work is performed.

Subsection 104.03 Remove and replace entire subsection to the following:

104.03-Extra Work. When unforeseen work results for any reason and is not handled as prescribed elsewhere herein, the Engineer and the Contractor will attempt to agree on equitable prices. When such prices are agreed upon, a Change Order will be executed, and a Construction Change will be issued by the Engineer. When equitable prices are not agreed upon mutually, the Engineer may issue a written order that the Extra Work be completed on a force account basis and paid for as provided in **Subsection 109.04**.

When the Change Order process is initiated, the Contractor shall be required to submit to the Project Supervisor detailed breakdowns for Materials, Labor, Equipment, Profit and Overhead. Profit and Overhead shall not exceed 15% of the subtotal of Materials, Labor and Equipment. When the Change Order is initiated for subcontractor items, the Prime Contractor's administrative cost shall not exceed 5% of the subcontractor's total (materials, labor, equipment, profit & overhead).

The requirement for detailed cost breakdowns may be waived when a Bid Item History exists for the proposed item(s), and the contractor's requested price is within 10% of the Regional, 3 year historic cost for that item. In any case, the Department reserves the right to request detailed information from the Contractor for any Change Order request.

Subsection 104.04 Maintenance of Traffic, Delete "with 30,000 or greater Average Daily Traffic or any interstate routes," from the third paragraph. **Change** " three (3)" to "seven (7)" in the third paragraph. **Delete** "(these restrictions apply to state routes with 30,000 or greater Average Daily Traffic or any interstate route):" from the fifth paragraph. **Add** "without the

written consent of the Engineer." to the end of the fifth paragraph. **Delete** "In addition, any state routes less than 30,000 ADT shall have no lane closures, or any lane restrictions of any type will be allowed on Good Friday, Labor Day, Memorial Day, July 4th , and the working day immediately preceding and including the holidays of Thanksgiving, and Christmas Day without the written consent of the Engineer." from the sixth paragraph.

4.06. Revise entire subsection to the following:**104.06-Maintenance During Construction.** The Contractor shall maintain the Work during construction and until the project or section (s) thereof, as provided for in **Subsection 105.13**, is accepted. This maintenance shall constitute continuous and effective work prosecuted day by day, with adequate equipment and forces to the end that the roadway or structures are kept in satisfactory condition at all times. In the case of a Contract for the placing of a course upon a course or subgrade previously constructed, the Contractor shall maintain the previous course or subgrade during all construction operations. The Contractor shall provide litter pickup, mowing, and vegetation removal throughout the life of the project in accordance with Subsection 806.

There will be no separate payment for maintenance work during construction and before the project is accepted, the cost thereof is to be included in prices bid on the various Contract items.

Subsection104.11. Revise entire subsection to the following:

104.11-Final Cleanup. Before final acceptance of the Work, the entire rights-of-way, all material pits, all waste areas, all areas and access roads used by the Contractor, all streams in or over which he has worked, and all ground occupied by the Contractor, in connection with the Work, shall be cleaned of all forms, falsework, temporary structures, temporary erosion control measures, excess materials, equipment, rubbish, and waste, and all parts of the work shall be left in a neat and presentable condition. The entire right-of-way, all material pits, all waste areas, all areas and access roads used by the Contractor shall be final stabilized per the TN NPDES Construction General Permit criteria or per the agreed upon Reclamation Plan. Final cleanup shall include the mowing of the rights-of-way as required. If the project was graded under a previous Contract, final cleanup will be performed within the construction limits of work being performed and other areas disturbed or otherwise requiring cleanup due to the Contractor's operations. No rubbish, waste or debris shall be deposited on or in sight of the rights-of-way. All damage to private and public property shall be replaced, repaired, or settled for.

Subsection 104.12 Add the following to Section 104 of the Standard Specifications.

104.12- Value Engineering Change Proposal (VECP). The Contractor may request a modification to the plans, the specifications or other contract requirements based on a Value Engineering Change Proposal (VECP) submitted to the Department specifying a cost reduction change. This will not apply to a proposal unless it is identified as a VECP at the time of its submittal.

Value Engineering Change Proposals (VECP) are those which would require a change in the contract and would result in an immediate net savings to the Department without impairing essential functions and characteristics of the project, including but not limited to the service life, reliability, economy of operation, maintenance and safety features. VECP's that propose a total savings of less than $25,000 (twenty-five thousand dollars) will normally not be considered unless there are other non-monetary savings to be realized.

The Contractor may submit for review a "VECP Concept" provided that it contains enough information to clearly define the work involved and the benefits to be realized. The "VECP Concept" shall state all applicable design criteria that will be used in the VECP design. Written notification by the Department that the review has been completed and that the "VECP Concept" appears to be favorable merely indicates that the engineering and plan development may continue for submittal of the VECP proposal and is not authorization for any construction work to begin. Should the final design not reflect the expected benefits, the Department may reject the "VECP Concept" and the VECP without recourse by the Contractor.

The following information, as a minimum, shall be submitted with each proposal to the Engineer, allowing adequate time for Department analysis and processing without interference with project schedules:

(a) A description of the difference between the existing contract requirements and the proposed change, and the comparative advantages and disadvantages of each.

(b) An itemized list of the contract changes required if the VECP is accepted, and any recommendation as to how to make each such change.

(c) A separate detailed cost estimate for (1) the affected portions of the existing contract requirements and (2) the VECP.

(d) A prediction of any effects the proposed change will have on other Department costs, such as costs of maintenance and operation.

(e) A statement of the time by which a supplemental agreement must be issued in order to obtain the proposed cost reduction for the project, noting any effect on the contract completion time or delivery schedule.

(f) The date(s) of any known previous or concurrent submissions of the same proposal and any previous actions by the Department.

(g) The contract items of work affected by the proposed change, including any quantity changes.

Proposed construction changes in pavement design, right of way, relocation of bridges, etc. or changes in the environmental impact statement will not normally be considered as an acceptable VECP. The Department may determine at any point during the evaluation process that the VECP is not cost effective and summarily reject the VECP.

While a VECP is being considered by the Department, the contractor shall continue to perform the work in accordance with the requirements of the contract. The Department has no obligation but to review the VECP and shall not be liable for failure to accept or act upon any VECP or for any delays to the work due to the submitted proposal. The Department shall be the sole judge of the acceptance or rejection of a VECP, either wholly or in part. If an agreement has not been reached by the date that the contractor's VECP specifies that a decision should be made, or such other date as the contractor may have specified in writing, the VECP shall be deemed rejected.

The Contractor shall have no claim against the Department for additional costs or delays resulting from the rejection of a VECP, including but not limited to, "VECP Concept" acceptance, engineering and development costs, loss of anticipated profits, and increased material or labor costs.

The Department will not accept a VECP that is similar to a change in the plans or specifications under consideration by the Department for the project at the time the proposal is submitted; nor will the Department accept a proposal based upon, or similar to, standard specifications, general use special provisions or standard drawings adopted by the Department after the advertisement for the contract. The Department reserves the right to make such changes without compensation to the Contractor under the provisions of Subsections 104.02 and 104.03 of the standard specifications.

The Department will determine the estimated net savings from the adoption of all or any part of the VECP. In determining the estimated net savings, the Department may disregard the contract bid prices if, in the judgment of the Department, such prices do not represent a fair measure of the value of the work to be performed or to be deleted.

In the event the Department accepts the VECP the contractor thereby grants to the Department all rights to adoption of the proposal for general use on other contracts without obligation or compensation of any kind.

Acceptance of a VECP will be by supplemental agreement incorporating the changes necessary to permit the VECP, or any part of it, to be put into effect. The supplemental agreement shall also set forth the estimated net savings to the Department and further provide that the contractor be paid 50 percent of the actual net savings.

The cost to the contractor to develop and implement the VECP and any design (including redesign by a Tennessee licensed engineer, preparation of new reproducible plans, etc. and any other information requested by the Department to facilitate its review) shall be incidental to the contractor and shall in no way affect the VECP payment herein before specified. The cost to the Department to review the VECP shall be incidental to the Department and shall not affect the VECP payment.

The actual net savings will be determined when the work in the VECP and Supplemental Agreement is completed. If upon completion of the work proposed in the VECP it is determined that the supplemental agreement did not adequately address a change in quantities for other pay items that were either increased or decreased substantially as a result of the change proposal, those additional costs or savings shall be included in the actual net savings determination. A single payment will be made to the contractor representing fifty percent (50%) of the actual net savings once all items are considered.

If the completed VECP results in an increase in cost such that there is no net savings, those costs above the original contract costs as proposed in the VECP and supplemental agreement will be reimbursed at a rate of fifty percent (50%).

The preparation of the VECP, its acceptance and performance of the work shall not extend the contract completion time unless the supplemental agreement provides an extension.

Subsection 105.02 Add the following as the first paragraph:

All contractors and subcontractors directly engaged in the erection or removal of falsework, temporary structures, structural steel, precast prestressed or mild steel reinforced concrete bridge beams or girders over active highway traffic lanes, on any route, railroad or any stream deemed navigable to commercial or pleasure water craft, shall be required to submit an erection plan prepared and stamped by a Tennessee registered engineer. Falsework (steel stay-in-place forms, overhang jacks, etc.) for bridge deck construction shall be installed in accordance with the manufacturer's recommendation and will not require a submittal. See also Subsection 602.41, 602.42, and 604.06.

Subsection 105.06, Revise the entire subsection to the following:

105.06-Planning of the Operations-Preconstruction Conference. After execution of the Contract by both parties thereto and prior to beginning work, the Contractor shall furnish the Engineer a complete and practicable plan of operations which shall provide for orderly and continuous performance of the Work. The plan of operations shall be in such form and in such detail as to show properly the sequence of operations, the location of operations and the period of time required for completion of the portion of the Work under each item or group of like items in the 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. An anticipated schedule may be submitted by the Contractor that will show the anticipated monthly progress for the duration of the Contract. If the Contractor does not submit an anticipated schedule, then a straight-line curve will be used to determine progress. The plan of operation shall indicate the manpower and equipment to be available to handle the several phases of the Work. If the Contractor so elects, the Work may be scheduled by the Critical Path Method (CPM); and if called for in the Proposal, utilization of the Critical Path Method (CPM) shall be mandatory. When required, the CPM should be updated at least every 30 days as directed by the Engineer.

Subsequent to submission of the plan of operation, the Contractor shall attend a preconstruction conference called by the Engineer. He shall have available at such meeting all data necessary to substantiate his plan of operation and the scheduling thereof.

In addition to this basic plan of operations, the Contractor shall keep the Engineer notified of his planned or contemplated operation details sufficiently in advance of starting each phase so that inspection may be arranged by the Engineer. Such notice shall include the nature and location of the work planned or contemplated, the date and time of starting, and any hours outside of the conventional working day and working week during which the prosecution of such work is contemplated. The performance of any work without such notice to the Engineer and in the absence of inspection or the written waiver thereof, in itself, shall constitute sufficient grounds for rejection of such portion of the work.

Subsection 105.09 Construction Stakes, Revise the 12th paragraph to the following:

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 or a Tennessee Registered Land Surveyor experienced in the direction of such work and acceptable to the Engineer.

Subsection 105.10. Revise entire Subsection to the following:

105.10-Authority and Duties of Inspectors. Inspectors employed by or contracted with the Department will be authorized to inspect all work done and all materials furnished. Such inspection may extend to any part or to all of the Work and to the preparation, fabrication, or manufacture of materials to be used including offsite waste and/or borrow areas. The Inspectors will have the authority to reject defective material and to suspend any construction that is being improperly done, subject to final decision by the Engineer. Inspectors will not be authorized to revoke, alter, enlarge, or relax the provisions of the Specifications, nor will they be authorized to

approve or accept any portion of the completed project, or to issue instructions contrary to the Plans and Specifications. At the request of the Contractor, instructions from an Inspector may be had in writing on important items.

Subsection 105.11. Revise entire subsection to the following:

105.11-Inspection of Work. All materials and each part or detail of the Work shall be subject to inspection by the Engineer, or his representative including waste and /or borrow areas. He shall be given free access to all parts of the Work at all times and shall be furnished all information, facilities, and assistance by the Contractor as may be required to make complete and detailed inspection. Any work done or materials used without supervision or inspection by an authorized Department representative may be ordered removed and replaced at the Contractor's expense unless the Department representative failed to inspect after having been given reasonable notice in writing that such portion of the Work was to be performed.

At any time before acceptance of the Work, the Contractor shall remove or uncover such portion thereof as may be directed. If examination discloses that the Work is acceptable under the terms of the Contract, the Contractor shall return it to the original condition, and the cost of exposing the Work for examination and of returning it to the original condition shall be paid for as Extra Work. If the Work exposed and examined does not prove acceptable, the cost of uncovering, or removing, of replacing all of the material involved, in full accordance with the Specifications and Plans, and of restoring the Work, shall all be at the expense of the Contractor. When any unit of government or political subdivision or any railroad corporation is to pay a portion of the cost of the Work covered by the Contract, its respective representatives shall have the right to inspect the Work. Such inspection shall in no sense make any unit of government or political subdivision or any railroad corporation a party to the Contract, and shall in no way interfere with the rights of either party hereunder.

Upon failure on the part of the Contractor to comply forthwith with any order of the Engineer made under the provisions of this Subsection, the Engineer will have authority to cause unacceptable work to be remedied or removed and to deduct the costs from any monies due the Contractor. In the event that monies due or to become due the Contractor are not sufficient to defray the costs of such repairs or replacements, then the Department will hold the Contractor's Surety liable for the costs incurred. Any Construction performed by the Department under these provisions will not waive any provisions of the Contract nor relieve the Contractor in any way the responsibility for the construction performed by him.

Subsection 105.13. Revise entire Subsection to the following:

105.13-Completion of Specific Sections of a Project. The Department may accept a section or sections of a project before the entire project is completed. Such section(s) shall be of reasonable length, as determined by the Engineer, and shall be completed in full accordance with the Plans, Specifications and all other applicable provisions of the Contract. When such sectiot (s) is fully completed, the Engineer, after final inspection, will accept the section(s) and the Contractor will be relieved of any further work in connection therewith or any cost of maintenance thereof.

The Department may require a specific section or sections of a project to be completed prior to the completion of the entire project. Such section(s) shall be completed in full accordance with the Plans, Specifications and all other applicable provisions of the Contract. All provisions

of the above paragraph regarding final inspection, acceptance, further work and maintenance shall apply.

After any offsite waste and/or borrow area (s) are no longer needed, the contractor shall ensure that the disturbed area is stabilized per the TN NPDES Construction General Permit criteria or per the agreed upon Reclamation Plan. After the area has reached final stabilization, the contractor shall request a meeting with the Engineer to perform a final inspection. Once the area is deemed acceptable, the contractor is responsible for terminating any Contractor obtained permits.

The acceptance of a section or sections of a project shall in no way void or alter any of the terms of the Contract.

Subsection 105.15. Revise entire Subsection to the following:

105.15-Acceptance. Upon due notice from the Contractor of presumptive completion of the entire project, the Engineer will make an inspection. If all construction provided for and contemplated by the Contract is found to be completed to his satisfaction, then that inspection shall constitute the final inspection and the Engineer will make the final acceptance and notify the Contractor in writing of his acceptance as of the date of the final inspection.

If, however, the inspection discloses any work, in whole or in part, as being unsatisfactory, the Engineer will give the Contractor the necessary instructions for correction of same, and the Contractor shall immediately comply with and execute such instructions. Upon correction of the Work, another inspection will be made which shall constitute the final inspection, provided the Work has been satisfactorily completed. In such event, the Engineer will make the final acceptance and notify the Contractor in writing of this acceptance as of the date of final inspection.

If exclusive offsite waste and/or borrow area(s) were used as part of the project, the Contractor must provide the Engineer proof of permit termination for all waste and/or borrow area(s) before the Engineer can start the process for final acceptance of the project. If the Contractor wishes to continue use of the waste and/or borrow area(s), the contractor shall provide the Engineer with a letter indicating the intended use and updated documentation.

Subsection 105.18 Method of Measurement, Remove and Replace Payment Schedule Table with the following:

PAYMENT SCHEDULE

Estimate Number or Percent of Total Contract Amount of Previous Estimate	Total Percent of Construction Stakes, Lines, and Grades Lump Sum Bid Item
Estimate # 1	20%
Estimate # 2	40%
10%	50%
20%	60%
40%	70%
60%	80%
80%	100%

Subsection 106.04, Fourth paragraph, **Insert** the word "notarized" in the first sentence, as follows

"A notarized Certificate of Compliance…"

Section 107-Legal Relations And Responsibility, Left out "**107.02-Load Restrictions on Projects Under Construction."**

Subsection 107.02 Load Restrictions, Revise entire Subsection to the following:

107.02-Load Restrictions.

(a). Delivery of Materials. The gross weight of trucks delivering material to construction projects shall be governed by State Law as set forth in Tennessee Code and Federal Law. All delivery trucks shall conspicuously display the tare weight, the allowable gross weight for State Highways, and the allowable gross weight for the Interstate System on the side of each truck. The Bridge Formula shall be used to determine allowable Interstate System gross weights as defined in the Federal Highways Administration's publication, *Bridge Formula Weights.*

The operation of equipment of such weight, or so loaded, as to cause damage to structures, the roadway, or to any other type of construction will not be permitted. Hauling of materials over the base course or surface course under construction shall be limited as directed. No loads will 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 equipment used in construction of the project.

In such cases where it is necessary to haul material over a structure, other than structures with posted load limitations, the Contractor shall be required to limit the gross loads to the weights listed below. The loads posted for structures with weight limitations shall not be exceeded unless adequate shoring is provided and written permission is granted by the Department's Division of Structures.

Maximum axle load .....32,000 lbs.
.....(14,515 kg.)
Maximum load per axle on tandem axles ....24,000 lbs
.....(10,886 kg.)
Maximum total load.....90,000 lbs.
.....(40,824 kg.)

The contractor will be further required to place approved temporary guides on the bridge floor, as directed by the Engineer, in order to position the wheel loads as nearly as possible directly over the bridge girders. He shall keep the bridge floor clean so as to reduce impact forces. The maximum speed permitted will be 15 miles(25 kilometers) per hour.

Upon completion of hauling over the bridge, the Contractor will be required to clean the bridge floor, curbs and rail in a manner acceptable to the Engineer.

(b). Construction Loads. Construction loads include all material, component, equipment, and personnel loads applied to the structure other than those which are a consequence of permanent elements of the structure in their final state of construction. All construction loads not essential to the active construction work shall be prohibited from placement on the structure. Construction loads on bridges applied anytime subsequent to the placement of girders shall not exceed 50 pounds per square foot based on a uniform distribution of load. Loads characterized as non-uniform in nature shall be reconciled either by analysis equating load to an effective uniform load or employment of timbers or other means approved by Engineer to distribute construction loads. Length of load distribution may be taken as the bridge beam spacing (or slab span between walls for concrete culverts) occurring at the location of load application. The Contractor will be responsible for submitting to the Engineer all analysis and supplementary support details required to effect proper construction load distribution. Contractor is advised that if concrete is mounded ahead of the screed machine during placement of the deck, that any portion extending above the screed elevation is considered a construction load in applying the provisions of this section. Construction loads shall be placed as optimally as reasonable to minimize loads on the structure. When the area occupied by construction loads in any structure span exceeds 25% of the area of that span the Contractor shall be required to submit a diagram detailing the location, character, sequence and weight of all construction loads applied to the structure to TDOT Division of Structures for approval. This submittal shall be executed a minimum of 30 days in advance of the planned operation. These provisions supplement those of Subsection 604.28.

Subsection 107.06 Federal Aid Provisions (b). Revise Subsection b to the following:

All waste and borrow areas outside the project right-of-way must be in compliance with Section 106 of the National Historic Preservation Act. The Contractor must furnish the TDOT Engineer and the Environmental Division with an Archaeological Clearance certified by the State Historic Preservation Office on all non-commercial material sources requiring excavation and/or fill.

Regardless of prior certification, if prehistoric remains or human burial sites are encountered at any time during construction, such operations shall be suspended and the Engineer and the State Historic Preservation Office shall be notified immediately.

All waste and borrow areas from outside the project right-of-way must comply with Section 7 of the Endangered Species Act. The contractor must furnish the TDOT Engineer and the Environmental Division with Threatened and Endangered Species Clearance from the Tennessee Wildlife Resource Agency and the U.S. Fish and Wildlife Service on all waste and borrow sites located outside project right-of-way.

The Archaeological Clearance certification, and the Threatened and Endangered Species Clearance from the Tennessee Wildlife Resource Agency and the U.S. Fish and Wildlife Service, must be furnished to the TDOT Engineer and the Environmental Division Permits Section, 30 days prior to work being started on all waste/borrow sites outside of the project right-of-way.

107.14-Legal Responsibilities of the Contractor. Revise entire subsection to the following:

107.14-Legal Responsibilities of the Contractor. In addition to the specific legal responsibilities set forth in **Subsections 107.01** through **107.12**, the Contractor is charged with other broad legal responsibilities under these Specifications. These responsibilities include but are not limited to various areas as follows:

(a) To perform the Work in accordance with all of the terms of the Contract (**Subsection 104.01**), including Construction Changes (**Subsection 104.02**), the supply and use of materials of the required quality (**Subsection 106.01**), the maintenance, during construction and until final acceptance, of all completed portions of the Work (**Subsection 104.06**), and the final cleanup (**Subsection 104.11**).

(b) To maintain traffic (Subsection 104.04), including the use of all proper and necessary protective devices and procedures (Subsection 104.05).

(c) To conduct all operations so as to protect the members of the general public, residents near the project, workmen engaged in or on the Work, and representatives of the State, the Federal Government and railroads, while they are engaged in duties connected with the Work. All workers within the right-of-way shall wear head protection meeting the current requirements of the American National Standards Institute (ANSI). Also, all workers within the right-of-way shall wear high-visibility safety apparel. High-visibility apparel shall be considered personal protective clothing that meets performance Class 2 or Class 3 of the ANSI/ISEA 107-2004 publication. Class 3 apparel shall be required for night work.

This responsibility also extends to the protection of public and private property under all circumstances.

(d) To hold harmless and defend against all claims of whatsoever nature arising out of the Work, the State, any political subdivision thereof, and all employees of the State, the Federal Government, and any railroad involved. This responsibility generally extends to innocent third parties.

(e) To pay just claims for materials, supplies, equipment, tools, labor, and all other items, against him or any Subcontractor, in connection with the Work.

It is the intent of these Specifications that the Contractor shall familiarize himself fully with these responsibilities and with the many others which are clearly inferred from the Contract but are not enumerated here; and that he makes certain that all things required to be performed are performed in such manner as to fulfill the responsibilities involved and that all appropriate and required precautions be taken at all times.

Subsection 107.20 No Waiver of Legal Rights, Delete and replace with the following:

107.20-No Waiver of Legal Rights. The Department shall not be precluded or estopped by any measurement, estimate, or certificate made either before or after the completion of the Work or by final acceptance of the Work according to **Subsection 105.15** from showing the true amount and character of the Work performed and materials furnished by the Contractor, nor from showing that any such measurement, estimate, or certificate is untrue or is incorrectly made, nor from showing that the Work or materials do not in fact conform to the Contract. The Department shall not be precluded or estopped, notwithstanding any such measurement, estimate, certificate and payment, or acceptance in accordance therewith, from recovering from the Contractor or his Sureties, or both, such overpayment or damages as it may sustain or damages due to the Contractor's failure to comply with the terms of the Contract. The Department shall retain and

apply monies owed to the Contractor under any Department Contract, or claim and recover by process of law such sums, in order to correct any error or make good any defects in the Work or materials.

Neither the acceptance by the Department, or any representative of the Department, nor any payment for or acceptance of the whole or any part of the Work, nor any extension of time, nor any possession taken by the Department, shall operate as a waiver of any portion of the Contract or of any power herein reserved, or of any right to damages. A waiver by the Department of any breach of the Contract shall not be held to be a waiver of any other or subsequent breach.

Subsection 107.23 Certified Payrolls, Revise entire Subsection to the following:

107.23 Certified Payrolls. As specified by Department procedures for the Contractor and subcontractor workforce, submit certified payrolls to the Engineer each week in which any work is performed. Once construction begins, if in any week the Contractor or subcontractor does not perform work, submit the following statement to the Engineer: "No work performed by (Contractor name) for the week ending _____."

Subsection 108.06- Determination of Time for Completion, Replace entire subsection with the following:

108.06-Determination of Time for Completion. The Contractor shall complete the Work in full accordance with **Subsections 104.01** and **105.03** within the number of working days or calendar days or by the completion date stipulated in the Proposal. If a number of working days govern in connection with a specific Contract, the Engineer will apprise the Contractor, monthly, of the number of accumulated working days charged against him. Protest by the Contractor, in such connection, shall be filed within five working days of receipt of the information. The Engineer will review such protest and the supporting information and will render decision either affirming or correcting the accumulated number of working days previously reported.

When the contract time is on a calendar day basis, it shall consist of the number of calendar days stated in the Contract counting from the effective date of the Engineer's order to commence work, including all Sundays, holidays and non-work days. 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.

When the Contract completion date is a fixed calendar date, all work on the project shall be completed on or before that date.

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 may be proportionally increased for major items only, as defined in section 101.64, if the Engineer determines that the increase in quantities for the major items has affected the completion of the project. If the contract requires a mandatory Critical Path Method (CPM), or contains an incentive clause, or a bonus clause for early completion, the Engineer shall not proportionately increase the working time. The Engineer will determine if the added work or increased quantities impact the submitted critical path workflow and will adjust the working time accordingly, but the incentive clause date or the bonus clause date will not be adjusted unless otherwise allowed in the Contract.

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 Subsection, 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 which he believes will justify the granting of his request. The Contractor's plea that insufficient time was specified is not a valid reason for extension of time. If the Engineer finds that the Work was delayed because of conditions beyond the control and without the fault of the Contractor, he 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 then be in full force and effect the same as though it were the original time for completion except

incentive clause date or the bonus clause date will not be adjusted unless otherwise allowed in the Contract.

Final acceptance will be made by the Engineer as prescribed in Subsection 105.15 and in accordance with the following:

State Funded Projects:

Upon presumptive completion of the project and due notice from the Contractor, the Engineer will make an inspection. If all items of work are completed to his satisfaction, the Engineer will accept the project and stop time charges as of the date of the inspection. However, if the inspection reveals that some items of work remain to be completed, the Engineer will direct the Contractor to complete these items and continue charging time until all work has been satisfactorily completed, regardless of the number of inspections required prior to project acceptance.

Federal-Aid Projects:

The procedure for Federal-aid projects will be the same as noted above for wholly State funded projects except that time charges will be suspended during the time interval between presumptive acceptance by the Engineer and the date of inspection by the Federal Highway Administration (FHWA). Should the FHWA Engineer find any work unsatisfactory, time charges will be resumed the day after the inspection during which such determination is made until correction of such work.

In the event further inspections by FHWA are required, the procedure described herein will be repeated until final acceptance of the project.

Subsection 108.07-Failure to Complete Work on Time, Remove entire subsection and **replaced** with the following:

108.07-Failure to Complete the Work on Time. For each calendar day over and above the stipulated completion date on which any portion of the Work remains incomplete, a sum of money shall be deducted from monies due the Contractor, not as a penalty but as liquidated damages. The amounts to be deducted shall be as set forth below.

Original Contract Amount			**Daily Charge**
$0	-	$500,000	$170.00$250.00
>500,000	-	1,000,000	$420.00
>1,000,000	-	2,000,000	$740.00
>2,000,000	-	10,000,000	$1,000.00
>10,000,000	-	20,000,000	$1,600.00
>20,000,000			$1,800.00

Permitting the Contractor to continue and finish the Work or any part of it after the time fixed for its completion, or after the date to which the time for completion may have been extended, will in no way operate as a waiver on the part of the Department of any of its rights under the Contract.

Subsection 108.08(a) Default, Replace the first sentence with the following:

The Department reserves the right to terminate, by a written Contract Termination Notice, any Contract, of which these Specifications are a part, if the Contractor:

Subsection 108.08(b) Without Fault, Replace the first sentence to the following:

The Department may, by a written Contract Termination Notice, with the approval of the Federal Highway Administration where applicable, terminate any Contract or a portion thereof after determining that for reasons beyond the control of the Contractor, the work contracted for cannot be completed. Such reasons for termination may include, but need not necessarily be limited to one of the following:

Subsection 108.08(c) New, Insert (c) Convenience with the following paragraphs.

(c) Convenience

The Department may, by a written Contract Termination Notice, with the approval of the Federal Highway Administration where applicable, terminate any contract, or any portion thereof for the Department's convenience, when the Engineer determines that, a termination is in the best interest of the Department.

A termination of the contract for convenience may be directed at any time after the Department has made a determination to award a contract. Such reasons for termination may include, but are not limited to:

1. Insufficient funds by the Department due to extenuating circumstances;
2. Orders from duly constituted authorities relating to energy conservation;
3. Restraining orders or injunctions obtained by third party citizen action resulting from federal or state environmental protection laws or where acts or omissions or persons or agencies whether or not the Contractor primarily caused the issuance of such order or injunction;
4. Occurrence of an environmental situation of a significant nature that would require extensive and time-consuming delays in the work for the purposes of identification, evaluation, and possibly mitigation;
5. Occurrence of a previously undiscovered error in the bid documents;
6. Any other circumstances determined by the Department to be in the best interest of the Department and/or public.

In addition to the general reservation of the right to terminate for convenience under this section, the bidding documents may provide for a termination of the contract for convenience under this section upon the occurrence or non-occurrence of a specified event after bid opening.

Under any of the above circumstances for termination, the Engineer will deliver to the Contractor and the Surety a written Contract Termination Notice for reasons that will be set forth therein. The Notice shall specify the extent to which performance of work is terminated under the Contract and the effective date of termination. Unless otherwise directed by the Engineer, upon receipt of a Contract Termination Notice, the Contractor, or his Surety, shall immediately:

1. Stop work as directed in the Notice.
2. Place no further orders or subcontracts for materials, services or facilities except as approved by the Engineer to complete work not terminated.
3. Terminate all orders and subcontracts for the terminated work.
4. Deliver to the Engineer completed or partially completed plans, drawings, information and other property required to be furnished under the contract.
5. Take any action that the Engineer directs to protect and preserve contract-related property that is in the possession of the contractor in which the Department has or may acquire an interest.
6. Provide all other information included in this section and/or as requested by the Engineer.
7. Complete all work not terminated.

If the Contract or any portion thereof is terminated before completion of all items of work in the contract; payment will be made for the actual number of units of items of work completed at the contract unit prices and as mutually agreed for items or work partially completed. No claim for loss of overhead or anticipated profits, including anticipated earnings on usage of owned equipment, and impact, delay, or other direct or indirect costs resulting from this termination, will be compensated as part of any settlement. Items that are eliminated in their entirety by the termination, will be paid according to **subsection 109.05**.

Completed or partially completed work will be paid for at the contract unit prices of the actual number of units or items of contract work completed prior to the effective date of the termination, or on a force account basis, as determined by the Engineer.

Reimbursement for organization of the Work (when not otherwise included in the contract) and moving equipment to and from the job will be considered where the volume of work completed is too small to compensate the Contractor for these expenses under the contract unit prices, the intent being that an equitable settlement will be made with the Contractor. The Department may consider reimbursing the Contractor for actual work done and actual costs incurred by the Contractor before notification. It may include only such cost items as mobilization, subcontractor costs not otherwise paid for, actual idle equipment costs only for any time the work is stopped in advance of the termination date, and guaranteed payments for private land usage as part of the original contract (when not otherwise included in the contract). Any claim request for additional costs, not covered in this section or elsewhere in the contract, shall be submitted within 60 calendar days of the effective termination date.

Acceptable materials, obtained by the Contractor for the Work, that have been inspected, tested, and accepted by the Engineer, and that are not incorporated in the Work, may, at the option of the Engineer, be purchased from the Contractor. The Contractor shall submit the proof of actual cost, as shown by receipted bills and actual cost records. The Engineer, as shown by actual cost records, may designate all actual costs for delivery at such points of delivery to be added to this cost. If the Engineer and the Contractor do not agree to purchase such materials, the Department may reimburse the Contractor for any reasonable restocking fees and handling costs incurred by the Contractor in returning said materials to the vendor. In the event that only portions of the contract work are eliminated, the Department may stop delivery and payment for materials made unnecessary.

Termination of a Contract or a portion thereof shall not relieve the Contractor of his responsibilities for the completed Work, nor shall it relieve his Surety of its obligation for and concerning any just claims arising out of the Work performed.

Subsection 109.02 Add the following to the end of Subsection 109.02:

The prime contractor must pay each subcontractor for work performed under its subcontract no later than 30 days from the date the prime contractor receives payment for the work from the Department. The prime contractor must pay each material supplier for materials supplied to the project no later than 30 days from the date the prime contractor receives payment for the material from the Department. In addition, all subcontractors, at all tiers, must make payment no later than 30 days to each subcontractor and material supplier for work and/or material provided for the project once they receive payment from the prime contractor or subcontractor. The prime contractor shall provide monthly payment certification to the Department entitled “Prompt Payment Certification Form”. An officer of the prime contractor shall sign the “Prompt Payment Certification Form”. The Department will withhold estimate payments if information is not submitted. The Department will withhold estimate payments for subcontracted items if subcontractors, at any tier, or materials suppliers are not paid. Also, all required certifications must be in the field office and accepted before such work is deemed satisfactorily completed. Any delay or postponement of payment from the above referenced time frame will result in accrual of interest as provided under TCA, Section 12-4-707(b).

The prime contractor, or subcontractors, at any tier, shall not withhold any retainage from progress payments made to their subcontractors.

The contractor shall also document on the "Prompt Payment Certification Form" the actual amount paid to any certified Disadvantaged Business Enterprise (DBE) or certified Small Business Enterprise (SBE) during the estimate period certification is being made.

Subsection 109.04-Methods of Payment for Extra Work, (a) Labor, Add "for profit and overhead" to the end of the second sentence.

Subsection 109.04-Methods of Payment for Extra Work, (c) Materials, Add "for profit and overhead" to the end of the sentence.

Subsection 109.04-Methods of Payment for Extra Work, (d) Equipment, Revise to the following:

(d) Equipment

Equipment used for Force Account work shall be of the size, type and number necessary to perform the required work in an economic and expeditious manner.

The Contractor shall submit for approval a list of all contractor owned equipment or equipment rented from another contractor (i.e. an entity not in the commercial rental business), including the manufacturer, make, model, year of manufacture, type of fuel, and other necessary information to determine proper hourly payment rate. The hourly rate shall not exceed the Monthly rate less the regional adjustment and age adjustment, as published in "*The Rental Rate Blue Book for Construction Equipment*" published by Equipment Watch, Prism Business Media, divided by 176. The contractor shall also submit for approval the hourly operating cost for all equipment. The hourly operating cost shall include all costs and labor for routine maintenance and servicing, including but not limited to fuel, lubrication, filters, blades, belts, pumps, lines, hoses, teeth, tires, tracks, etc.. The hourly operating costs shall not exceed the rates published in "The Rental Rate Blue Book for Construction Equipment". The rental rates will be paid for the actual time that the equipment is in operation. The weekly, daily or hourly premium equipment rates shown in the Blue Book shall not be used.

Contractor owned equipment or equipment rented from another contractor that has been approved for force account work that remains idle or on standby will be paid at a rate of 50% of the hourly rate calculated above. Idle equipment shall not be paid for more than 8 hours in a day or 40 hours in a week or on days of inclement weather when no other work is taking place. Equipment that is inoperable will not be paid idle time. The Department will determine if it will be more cost effective to pay idle time on approved equipment or for multiple mobilizations.

For equipment being used to complete force account work for part of the day and idle for a part of a day, the total hours that can be charged will be 8 hours, unless the equipment is in operation for more than 8 hours. Idle time will not be paid for any equipment which operates more than 8 hours in a day

Equipment that is rented or leased from a commercial rental company will be paid for at actual invoice price, provided the prices are fair and reasonable but not to exceed the monthly rate published in "The Rental Rate Blue Book for Construction Equipment". The Department will pay a mark up of 15% for all rented/leased equipment for profit and overhead. The contractor shall also submit for approval the hourly operating cost for all rented/leased equipment if the rent/lease agreement does

not include these expenses. The mark up will not apply to hourly operating costs. Rented or leased equipment will not be subject to payment for idle time. The Department will determine if it will be more cost effective to leave the equipment on site idle paying invoice price or pay for multiple mobilizations.

Subsection 109.04-Methods of Payment for Extra Work, (e) Transporting Equipment, Revise to the following:

(e) Transporting Equipment

When it is necessary to bring approved equipment to the project site, the contractor will be reimbursed for these costs and the costs to return it to its original location. The cost to return shall not be more than the cost to deliver. If a piece of equipment is delivered to the project site and used for other contract pay items then return costs will not be reimbursed.

If the equipment is transported by the contractor, then payment will be by hourly rate as calculated in 109.04 (d) for other equipment. If the equipment is transported by common carrier, then payment will be the actual invoiced amount with no markup.

Subsection 109.04-Methods of Payment for Extra Work, (f) Subcontracting and Professional Services, Revise to the following:

(f) Subcontracting and Professional Services.

The contractor will be paid an administrative fee of 5% for all approved force account work completed by subcontractors and for approved special services associated with the force account work. Invoices shall be submitted for all subcontracted and professional services rendered.

Subsection 109.04-Methods of Payment for Extra Work, (g) Miscellaneous, Revise to the following:

(g) Miscellaneous.

No additional allowance will be made for general superintendence (Superintendent), time keepers, the use of small tools, or other costs for which no special allowance is herein provided.

Subsection 109.04-Methods of Payment for Extra Work, (h) Compensation, Revise to the following:

(h) Compensation.

The Contractor's representative and the Engineer shall compare records of the cost of work done as ordered on a force account basis at the end of each day's work.

Subsection 109.04-Methods of Payment for Extra Work, (I) Statements, Revise to the following:

(i) Statements.

No payment will be made for work performed on a force account basis until the Contractor has furnished the Engineer with duplicate certified itemized statements of the cost of such force account work detailed as follows:

1. Name, classification, date, daily hours, total hours, rate, and extension for each laborer and foreman.
2. Designation, dates, daily hours, total hours, rental rate, and extension for each unit of machinery and equipment.
3. Quantities of materials, prices, and extensions.
4. Transportation of materials.
5. Cost of property damage, liability and workmen's compensation insurance premiums, unemployment insurance contributions and social security tax.

Statements shall be accompanied and supported by receipted invoices for all materials used, including transportation charges. However, if materials used on the force account work are not specifically purchased for such work but are taken from the Contractor's stock, then in lieu of the invoices, the Contractor shall furnish an affidavit certifying that such materials were taken from his stock, that the quantity claimed was actually used, and that the price and transportation claimed represent the actual cost to the Contractor.

Subsection 109.06, Remove and Replace the entire subsection with the following:

When requested in writing by the Contractor and approved by the Engineer, partial payment of non-perishable materials that will be permanently incorporated into the project may be made. These materials must be stockpiled in an approved manner on or near the project site or in special cases at an off-site location because of fabrication. These off-site locations should be limited to special cases where the material cannot be readily stockpiled at the project site such as steel structure components, prefabricated bridge components, etc. Material stored at an off-site location shall be clearly marked with the project information. A map noting the location shall be provided to the Project Supervisor. The material stockpiled on the project site shall be stored in an approved manner so that the quality of the material is not compromised. No payment will be made prior to inspection and documentation by a TDOT representative. Material, whether stored on-site or off-site, shall be readily identifiable in order to reference the quantity and assigned project.

Materials that may be included in partial payments: aggregates (stored on project, not at quarry), reinforcing steel, bridge piling, structural steel (fabricated units or steel delivered to fabricator if designated for particular project), precast concrete structures, traffic signal equipment, electrical equipment, fencing materials, sign materials, guardrail, and others as approved by the Project Supervisor.

Materials that may not be included in partial payments: Living or perishable plant materials, seed, fuel, used materials, form lumber, falsework, temporary erosion items, and other temporary items that will not become part of the completed work.

The payment for stockpile materials is initiated by the Contractor with a request to the Project Supervisor. The request shall be made in writing and shall contain the following information:

1. Request for stockpile payment that includes the following information:
    a. Contract and Project Numbers
    b. Item Number and Description as stated in the Contract Proposal

c. Quantity and Unit of measure
d. Conversion factor, if applicable

2. Written statement of assurance that material will be used on the specific project
3. Written consent of Prime Contractor's surety
4. Copy of certified paid invoice (in order to certify, a representative of the supplier must mark the invoice as paid in full, sign and date)
5. If the certified paid invoice is unavailable, a stockpile payment may be conditionally approved with receipt of the Surety's consent and a copy of the unpaid invoice. However, the contractor must submit the certified paid invoice within 30 days following the date of the progress payment for which the stockpiled material was paid. If the certified paid invoice is not submitted, the stockpile payment will be deducted from the following progress payment. In addition, any further requests for stockpile payment of that item must be accompanied by a certified paid invoice, or stockpile payment will not be paid.
6. Material certifications/Test reports for the material.

Partial payment will only be considered for an invoice or accumulation of invoices totaling $5,000.00 for each eligible pay item. Individual invoices shall not total less than $2,500.00. Invoices may include tax and freight. Partial payment shall not exceed 100% of the invoice amount or 75% of the contract unit price, whichever is less.

Stockpile payments shall not exceed the contract amount, unless the contract amount is increased by an approved change order. Payments will not be made for items that will be incorporated permanently into the project within 30 days from request of stockpile payment.

The Contractor shall assume full responsibility for the stockpiled materials from the elements and against loss or damage by any cause. In the event any of these stockpiled materials become lost, stolen, impaired or damaged after partial payment has been made, the monetary value of the lost, stolen, impaired or damaged material as may have been paid for in a current estimate will be deducted from the next estimate, and no further payment will be made until such material has been satisfactorily replaced in accordance with specification requirements.

The department will not withhold retainage from the Contractor. No monthly estimate or partial payment will be made when the total value of the work done since the last previous monthly estimate amounts to less than $1000.00.

After the first partial payment, the Department reserves the right to withhold any subsequent partial payments until it has been completely satisfied by the Contractor that his labor, material, and equipment costs and any claims for other reasons are paid on a current basis. Should any defective construction or material be discovered, or should a reasonable doubt arise as to the satisfactory quality of any part of the construction completed prior to final acceptance and payment, there will be deducted from the first estimate rendered after the discovery of such defective or questioned construction, and if necessary, from subsequent estimates, an amount sufficient to insure the replacement of such work by the Contractor or by others as may prove necessary.

Subsection 109.08 New, insert the following:

109.08-Payment of Costs Owed to the Department.

The Contractor, without prejudice to the terms of the Department Contract, shall be liable to the Department for any or all of the following: fraud or such gross mistakes as may amount to fraud, the Department's rights under any warranty or guarantee, or any latent defects in the work.

The Department reserves the right to set off against any amount otherwise due the Contractor or his Sureties, or both, under this Contract or under any other contract or arrangement, including payment obligations under **Section 109.04** of these Specifications, that the Contractor or his Sureties, or both, has with the Department, the following:

1. any costs that the Department has incurred due to noncompliance with this contract by the Contractor or his Sureties, or both, and
2. any other amounts that are due and payable from the Contractor or his Sureties, or both, to the Department

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

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Supplemental Specifications - Section 200

of the

Standard Specifications for Road and Bridge Construction

Subsection 201.03-Clearing and Grubbing. Replace the entire subsection with the following:

201.03-Clearing and Grubbing. The Engineer or Contractor when required will establish rights-of-way lines and construction lines, and the Engineer will designate all trees, shrubs, plants, and other objects to remain. The rights-of-way necessary for construction, as directed by the Engineer, shall be cleared of all dead trees, stumps, brush, projecting roots, hedge, weeds, pole stubs, logs, and other objectionable material. All trees, stumps, roots, pole stubs, brush, hedge, and other protruding obstructions within the area bounded by lines 5 ft. (1.5 m) outside the construction lines shall be completely grubbed except sound undisturbed stumps and roots which will be a minimum of 5 ft. (1.5 m) below subgrade or slope of embankment may be allowed to remain in place provided undercutting or other corrective measures, or topsoil stripping is not stipulated in the Plans or directed by the Engineer and providing stumps do not extend more than 6 in. (15 cm) above the ground surface. This work shall be done in advance of excavation and embankment operations.

Before construction activities begin, two types of areas must be marked within the project site. First, the limits of disturbance (clearing limits) must be clearly marked using staking or another acceptable visible marking method. Second, any environmentally sensitive areas such as streams, wetlands, buffers and ARAP boundaries that are included in the project boundaries must be marked with highly visible markers. Highly visible markers must be readily visible to project personnel including equipment operators.

Clearing and grubbing operations shall be avoided in areas designated to remain undisturbed as specified in the project's Stormwater Pollution Prevention Plan and any other applicable environmental permits. For clearing and grubbing activities associated with borrow pits or waste areas furnished by the Contractor, the borrow pits or waste areas must be approved in advance by the Project Supervisor, the Environmental Coordinator, and the Environmental Division and operated and maintained in accordance with the Procedures for Providing Offsite Waste and Borrow on TDOT Construction Projects Manual.

When embankments are to be constructed in swampy areas, and undercutting or other corrective measures are not stipulated in the Plans or directed by the Engineer for these areas, undisturbed trees and stumps may be cut off at not more than 6 in. (15 cm) above the ground surface or low water level and the stump and root mass remain in place, if approved by the Engineer.

Unless marked for removal by the Engineer, living trees more than 5 ft. (1.5 m) outside the construction lines of the road are to be undisturbed, and are to be protected by the Contractor during construction of the project. Cut or scarred surfaces of trees or shrubs shall be treated with a paint prepared especially for tree surgery.

Clearing of hedge, weeds, pole stubs, logs, and other objectionable material inside the rights-of-way but outside the construction lines shall be completed to the ground surface.

Low hanging branches and unsound or unsightly branches on trees or shrubs designated to remain shall be removed as directed. Branches of trees extending over the roadbed shall be trimmed to give a clear height of 20 ft. (6 m) above the roadbed surface. All trimming shall be done by skilled workmen and in accordance with good tree surgery practices.

Trees more than 5 ft. (1.5 m) outside the construction lines and marked for removal by the Engineer shall be cut off within 6 in. (15 cm) of the ground surface. All stumps more than 5 ft. (1.5 m) outside the construction lines shall be trimmed to within 6 in. (15 cm) of the ground surface.

Wood debris that is chipped on site shall be properly disposed of so that does not become part of embankment. Within the areas where embankments are to be constructed, all depressions resulting from grubbing operations shall be backfilled with suitable excavation material and compacted in accordance with the provisions of Section 205 to natural ground elevation before embankment construction is started.

Depressions in excavation areas which are below finished subgrade elevation resulting from grubbing operations shall be backfilled with suitable material and compacted to finished subgrade in accordance with the provisions of Section 205 during the excavation operations.

Backfilling shall be completed a satisfactory distance ahead of embankment construction operations.

All slopes of cuts, embankments, ditches, channels, waterways and all structures both old and new, shall be cleared of all brush, hedges, weeds, heavy vegetation, and other objectionable material; and shall be maintained in a neat and satisfactory condition until the project is accepted.

Areas approved as borrow pits by the Engineer shall be cleared and grubbed of all trees, stumps, brush and heavy vegetation. Areas designated for obtaining construction material other than borrow material shall be cleared and grubbed of trees, stumps, brush and vegetation, and in addition shall be stripped of overburden laying above the material to be obtained. This work shall be completed well in advance of the removal of borrow or construction materials. Any offsite borrow areas must also be in accordance with the Procedures for Providing Offsite Waste and Borrow on TDOT Construction Projects Manual

Areas within the limits of all drainage structures shall be cleared of all objectionable material to within 3 in. (75 mm) of the ground surface. Such areas shall extend the full length of the structures, as measured along the center-line of the highway, and to the rights-of-way lines along lines parallel to the centerline of the inlet and outlet channel or drainage of the structure. These areas shall also include the entire area of all easements obtained for drainage purposes.

Subsection 201.04- Disposal of Debris. Replace second paragraph with the following:

When permitted by the Engineer, perishable materials and debris may be removed from the rights-of-way and disposed of at locations off the project, outside the limits of view from the project during all seasons as long as the work is in accordance with the Procedures for Providing Offsite Waste and Borrow on TDOT Construction Projects Manual. The cost involved shall be

included in the bid cost for the project. In addition the material shall be disposed of in accordance with all applicable laws and ordinances regarding solid wastes as per Tennessee Department of Environment and Conservation requirements.

Subsection 201.05-Method of Measurement. Add the following to the end of the first paragraph.

"When the bid schedule contains an item for Clearing and Grubbing on a lump sum basis, no measurement of area will be made."

Subsection 201.06-Basis of Payments. Revise entire subsection to the following:

"Payment for Clearing and Grubbing shall be made at the contract unit price per lump sum and shall be full compensation for completing the Clearing and Grubbing as outlined on the Plans and in these Specifications."

Payment for Clearing and Grubbing (Borrow Pits) at the contract unit price per acre (hectare) shall be full compensation for completing the Clearing and Grubbing of Department furnished borrow pits as outlined in the Plans and in these Specifications. These borrow areas will be furnished in accordance with the Procedures for Providing Offsite Waste and Borrow on TDOT Construction Projects Manual.

Subsection 202.03-General. Replace the last sentence of the first paragraph with the following:

Material disposed of on private property shall be disposed of in accordance with the Procedures for Providing Offsite Waste and Borrow on TDOT Construction Projects Manual.

Subsection 202.04- Removal of Bridges, Culverts, and Other Drainage Structures. Replace the entire subsection with the following:

202.04-Removal of Bridges, Culverts, and Other Drainage Structures. Bridges, culverts and other drainage structures in use by traffic shall not be removed until satisfactory arrangements have been made to accommodate traffic. All bridge, culvert and drainage structure removal from streams must comply with any terms and conditions specified in applicable environmental permits, including the TN Construction General Permit. The Contractor will use highly visible markers to clearly mark permit boundaries and disturbed area limits.

Unless otherwise specified or directed, such portions of the substructures of bridges located in a stream shall be removed to 1 ft. (30 cm) below the adjacent ground level or natural stream bottom or the lowest scour elevation shown on the contract plans if shown to uncover the existing portion of the substructure. An exception to the above rule may occur if such portions of the substructure of a bridge are located in a stream or wetland, and then it shall be subject to the requirements set out in the permit form of the applicable State and Federal agencies approving the location and plans and authorizing the construction of the bridge. Where such portions of existing structures lie wholly or in part within the limits for a new structure, they shall be removed as necessary to accommodate the construction of the proposed structure.

Steel bridges, precast or precast prestressed bridges and wood bridges designated to become the property of the Department shall be carefully dismantled without unnecessary damage. All such material shall be stored as specified in **Subsection 202.03.**

The removal of bridge decks shall be governed by the following:

1. Where bridge decks are to be wholly removed, but the girders are to remain in service;

   A. If the contractor elects to employ concrete saws to aid in the removal of the concrete deck, sawing transverse, the depth of the cut may not exceed the following :

      - Decks supported by steel beams or girders, 3-in. (75mm.)
      - Decks supported by prestressed concrete beams, 3-in. (75mm.)
      - Decks of cast-in-place hollow box or t-beam bridges, 1-in. (25mm.)

   B. The remainder of the slab depth under the cuts must be completed using pneumatically or electrically operated chipping hammers, not exceeding 60 lbs. (27.2 kgs.) in weight.

   C. Longitudinal saw cuts may be full depth, but no closer than –

      - Decks supported by steel beams or girders, within 1-in. (25 mm) of the widest top flanges.
      - Decks supported by prestressed beams, within 1 in. (25 mm) of the top flange.
      - Decks of hollow boxes or t-beam bridges, within 1-in. (25 mm) of the web, unless otherwise noted on the contract plans.

2. Where only the slab overhangs are to be removed, and if the contractor elects to employ concrete saws to aid in the removal of overhangs, only the top 1-in. (25 mm) of the slab may be saw cut. Pneumatically or electrically operated chipping hammers, not exceeding 60 lbs. (27.2 kgs.) in weight may be used to remove the remainder of the concrete. Care shall be taken not to damage transverse slab reinforcing bars.

3 Where bridge decks are to be removed as part of complete bridge demolition and the contractor elects to employ concrete saws in the removal of the deck, the depth of the cuts may not exceed the following:

   A. Decks supported by steel beams or girders, the plans depth of slab minus 1-in. (25 mm).
   B. Decks of hollow box or t-beam bridges; if not otherwise shown on the contract plans, the contractor shall submit a plan to the engineer for approval.

The use of hoe rams, pneumatic shears, pavement breakers, or other heavy equipment to remove slabs, where girders or adjacent slab portions are to remain, is strictly prohibited.

Blasting or other operations necessary for the removal of an existing structure or obstruction, which may damage new construction, shall be completed prior to placing the new work, or adequate precautions shall be taken to prevent such damage.

Subsection 203.01 Description. Add the following as the last paragraph to this Subsection:

The Contractor must address both natural and created steep slope areas as required in the TN Construction General Permit. Steep slope requirements for erosion prevention and sediment controls and stabilization shall be in accordance with the TN Construction General Permit and any other applicable environmental permits.

Subsection 203.02-Classification. Replace the entire subsection with the following:

(a) Road and Drainage Excavation (Unclassified).

All excavation performed under this Section, including portland cement concrete located above subgrade elevation, other than Borrow Excavation, Channel Excavation, and Undercutting, will be considered unclassified excavation regardless of the nature of the material excavated.

(b) Borrow Excavation.

Borrow Excavation shall consist of material required for the construction of embankments or other portions of the work and shall be obtained from approved sources outside the right-of way limits in accordance with the Procedures for Providing Offsite Waste and Borrow on TDOT Construction Projects Manual, unless otherwise designated in the Plans. However, any material, other than Borrow Excavation (Unclassified), as may be found in the excavation that meets the specifications of the designated borrow material may be used in the project in accordance with the conditions prescribed in **Subsection 104.10**. However, if the flattening of certain cut slopes on projects graded under previous contracts is desirable and approved in writing by the Engineer, the Contractor will be permitted to use this material for borrow provided the material is satisfactory and in accordance with plans approved by the Engineer, and provided he complies with the requirements of **Subsection 203.04** regarding borrow areas. Borrow material shall not be obtained from wetland areas, unless otherwise noted on the Plans and approved by applicable environmental permits

Borrow shall be classified as Borrow Excavation (Solid Rock), Borrow Excavation (Graded Solid Rock), Borrow Excavation (Unclassified), or Borrow Excavation (Select Material). Borrow Excavation (Solid Rock) shall consist of the removal and satisfactory placement of non-degradable rock which cannot be economically excavated by the proper use of a power shovel or without the use of explosives. Borrow Excavation (Unclassified) shall consist of the removal and satisfactory placement of all approved material encompassed under the classification of Borrow Excavation (Solid Rock) and all other approved material.

Borrow Excavation (Graded Solid Rock) shall consist of the removal and satisfactory placement of sound, non-degradable rock with a maximum size of 3 ft. (1 m). At least 50 percent of the rock shall be uniformly distributed between 1 ft. (30 cm) and 3 ft. (1 m) in diameter and no greater than 10 percent shall be less than 2 in. (50 mm) in diameter. The material shall be roughly equi-dimensional in shape. Thin, slabby material will not be accepted. The Contractor shall be required to process the material with an acceptable mechanical screening process that produces the required gradation. When the material is subjected to five alternations of the sodium sulfate soundness test (AASHTO T 104), the weighted percentage of loss shall be not more than 12. The material shall be approved by the Engineer before use.

Borrow Material other than solid rock shall be AASHTO M 145, classification A-6 or better if reasonably available. If classification A-6 is not reasonably available, the borrow shall be no worse than the predominant soil type in the roadway excavation based on AASHTO classification.

Borrow Excavation (Select Material) for special construction purposes shall meet the requirements set forth in the Contract.

Material obtained from an approved borrow source off the right-of-way as provided in this Subsection shall not be utilized to produce processed aggregate as described in Section 903. In no case shall material excavated from an offsite borrow source be utilized in base or other paving courses above the elevation of the subgrade.

Unless otherwise designated in the Contract, the Contractor shall make his own arrangements for obtaining borrow material in accordance with the Procedures for Providing Offsite Waste and Borrow on TDOT Construction Projects Manual.

(c) Channel Excavation (Unclassified).

This item shall consist of the removal and satisfactory disposal of all material, regardless of its nature and the manner in which it may be removed, that is excavated for channel changes in widening, deepening, and straightening existing channels or constructing new ones, which have a width at the bottom of more than 14 ft. (4 m) as indicated on the Plans. All other similar excavation with a bottom width 14 ft. (4 m) or less, as shown on the Plans, shall be paid for as Road and Drainage Excavation (Unclassified).). Any channel excavation that includes an existing stream or a proposed stream relocation must be constructed as specified in the applicable environmental permits.

(d) Undercutting.

This item shall consist of removing and disposing of unsatisfactory materials below grade in cut sections, from areas upon which embankments are to be placed, and may also include material excavated below the Foundation elevation for pipe, box culverts and box bridges as described in **Subsection 204.12**. Undercutting does not include the stripping, stockpiling and placing of topsoil, described in **Subsection 203.06**, nor does it include step-benching in the preparation of embankment areas on hillsides. Disposal of undercutting material off rights-of-way shall be conducted in accordance with the Procedures for Providing Offsite Waste and Borrow on TDOT Construction Projects Manual.

Subsection 203.04 General. Replace the entire subsection with the following:

203.04-General. Prior to beginning excavation, grading, and embankment operations in any area, all necessary Clearing and Grubbing, Removal of Structures and Obstructions and placement of Erosion Control Devices in that area shall have been performed in accordance with **Section 201, Section 202** and **Section 209**, respectively, of these Specifications.

Excavation materials shall be removed in such a manner that the slopes may be neatly trimmed to the lines given. The Engineer may change the slopes shown on the original cross sections, depress raised medians or islands, raise depressed medians or islands or daylight cuts to increase or decrease the quantity of Road and Drainage Excavation (Unclassified) provided the material can be excavated without blasting and these changes are set in the slope stakes prior to commencement of excavation of the affected slopes, medians or islands. Any additional material

thus obtained shall be paid for at the contract unit price bid for Road and Drainage Excavation (Unclassified).

Excavation required to correct slides, regardless of its location relative to the theoretical slope line, or excavation required to prevent potential slides including blasting, and the dressing, reshaping or flattening of the affected slopes as directed by the Engineer, shall be paid for under the Item for Road and Drainage Excavation (Additional Material) in accordance with **Subsection 203.10**. If it becomes necessary to flatten a slope to correct a slide or prevent a potential slide after the cut has been started but not completed, payment under Road and Drainage Excavation (Additional Material) will be limited to material removed between the original staked slope line and the newly established slope line above the elevation to which the cut has been made. All other material will be paid for at the contract unit price of Road and Drainage Excavation (Unclassified). Seeding, sod and other incidental items required to repair the slide area will be paid for at the contract unit price bid for the respective items.

If more material is required to complete the embankments after all cuts have been brought to grade and all Road and Drainage Excavation (Unclassified) has been removed from within the balance, additional materials shall be obtained from within the rights-of-way by flattening, widening or daylighting cut slopes, and by depressing raised medians or islands at locations designated and as directed by the Engineer provided:

(a) The cost of this material is more economical than borrow excavation.

(b) The material is available within the adjusted balance where the shortage exists or the material may be hauled outside the limits of adjusted balance if the cost of the material is more economical than borrow when the additional cost of overhaul is considered.

(c) The material can be excavated without blasting.

(d) There is a minimum of 20 ft. (6 m) between the top of the existing slope and the top of the new slope and minimum of 5 ft. (1.5 m) between the top of the new slope and Rights-of-Way Line or Control Access fence. The 20 ft. (6 m) minimum will not apply when the existing slope is 4:1 or flatter or to overlapping or near overlapping slopes in medians or between parallel roads or ramps. The 20 ft. (6 m) minimum may be reduced at the written request of the Contractor.

This additional material is to be paid for under the item for Road and Drainage Excavation (Additional Material) in accordance with **Subsection 203.10**.

When additional material is paid for under the item for Road and Drainage Excavation(Additional Material) and additional clearing and grubbing is required, the additional clearing and grubbing will be measured and paid for by the acre (hectare), provided the item for Adjusted Clearing and Grubbing is in the Contract, or as negotiated. No additional payment will be made for extra handling of stockpiled topsoil made necessary by the use of the item for Road and Drainage Excavation (Additional Material).

The roadbed through rock cuts shall be constructed to the grading line shown on the Plans, with an allowable working tolerance of plus 1 to minus 3 in. (plus 25 to minus 75 mm). The portions of the roadway that are less than 3 in. (75 mm) below grade shall be brought to grade with spalls or other suitable granular material that is available from the excavation within the

balance. If such excavation is not available, the Engineer may direct the Contractor to use approved base material for capping. Payment for furnishing and placing said base material will be made at the contract unit price bid per ton (metric ton) for the applicable Item in **Subsection 303.14**. When base material is not a bid item in the Contract, the material shall be furnished under the provisions of **Subsection 104.03**. If the roadbed is excavated in excess of 3 in. (75 mm) below the grading line shown on the Plans, the Contractor will be required to furnish and place at his own expense sufficient amounts of spalls or base material to bring the roadbed to a line 3 in. (75 mm) below the grading line.

Where sodding is indicated on the Plans to be placed on rock cuts, the rock shall be removed to 1 ft. (30 cm) below the grading line and backfilled to grade with earthen material prior to placing the sod. Measurement and payment of this work will be made under Items for Roadway and Drainage Excavation (Unclassified) and Sodding (New Sod).

All suitable materials removed from the excavation areas shall be used in the construction of embankments, intersecting road approaches, and in such other places as directed. Embankment construction shall be performed in accordance with the provisions of **Section 205** of these Specifications.

When boulder formations occur, the roadbed in the excavation area shall be scarified and all boulders removed to a depth of 12 in. (30 cm) below grade. The cavities thus formed shall be backfilled with suitable material and compacted.

All rock cuts shall be presplit at the outside limits of the cut areas. Presplitting shall consist of forming a plane of split rock prior to any primary blasting. The plane shall be formed for the entire depth of the cut or to a predetermined bench level. Presplitting shall be accomplished by drilling holes of appropriate size to the desired depth along the outside limits of the cut area, loading such holes with appropriate charges of explosives, stemming with minus 3/8 in. (9.5 mm) clean stone chips to the collar of the holes and detonating simultaneously. The initial horizontal spacing of holes and vertical spacing of charges and blasting cord for simultaneous detonation shall be as recommended by a reliable powder company. Adjustments of horizontal hole spacing and vertical spacing of charges shall be made as necessary to obtain a relatively smooth shear plane. Sand, gravel, clay, or dirt will not be permitted for stemming. In drilling holes for presplitting, the drills shall be plumbed for vertical slopes or set on the required slope when other than vertical slopes are specified, and all holes shall be drilled in the same plane. Presplitting will not be required on slopes flatter than 1 to 1. After presplitting is done, the drilling of primary blast holes shall be kept at least 3 ft. (1 m) or more from the presplit face. Presplitting of rock cuts under bridge sites shall be in accordance with the provisions of this Subsection and hole spacing shall be as specified under **Subsection 204.08**. Blasting records shall be made available on request by the Engineer. Blasting shall not be permitted within 300 ft. (100 m) of any Structure or concrete until at least 72 hours have elapsed after placement of the concrete. The Contractor will be responsible and replace and/or repair any and all damages at no expense to the Department.

All loose rock on cut slopes shall be removed immediately. Excavation material shall not be wasted, deposited or disposed of outside the construction lines unless directed by the Engineer. All excavation material wasted, deposited or disposed of outside the construction lines must be in accordance with the Procedures for Providing Offsite Waste and Borrow on TDOT Construction Projects Manual. Obliteration of old roadways shall include all grading operations necessary to incorporate the old roadway into the new roadway and surroundings in order to provide a pleasing appearance from the new roadway.

Removal of concrete pavement, base, parking strip, sidewalk, curb and gutter, etc. will be paid for under the classifications as prescribed in **Subsections 202.06 and 203.02(a).** Roadway obliteration will be paid for as Road and Drainage Excavation (Unclassified).

When the Contractor's excavating operations encounter remains of prehistoric people's dwelling sites or artifacts of historical or archaeological significance, the operations shall be temporarily discontinued. The Engineer will contact archaeological authorities to determine the disposition thereof.

The Engineer shall designate as unsuitable those soils that cannot be properly compacted in embankments. All unsuitable soil shall be disposed of as directed at no additional cost.

When the location of unstable soil is shown on the Plans, its removal and replacement shall be as shown.

The Contractor shall notify the Engineer sufficiently in advance of opening any borrow area so that, after stripping, cross section elevations and measurements of the ground surface may be taken, and so that the borrow material can be tested before being used. The borrow area shall be approved in accordance with the Procedures for Providing Offsite Waste and Borrow on TDOT Construction Projects Manual. At least 14 days' time shall be allowed for testing borrow materials or other material from roadside pits that is proposed for construction purposes.

Unless otherwise permitted, borrow material shall not be placed until after the roadway excavation has been placed in the embankments. If the Contractor places more borrow than is required and thereby causes a waste of excavation, the amount of such waste will be deducted from the borrow volume as measured in the borrow area. The Contractor shall not excavate beyond the dimensions and elevations established.

When the Contractor elects to remove highway fencing to obtain borrow materials, the fencing shall be replaced with new fence at the Contractor's expense. The Contractor shall be responsible for the confinement of livestock when a portion of the fence is removed.

Borrow pits shall be approved in accordance with the Procedures for Providing Offsite Waste and Borrow on TDOT Construction Projects Manual and excavated in such a manner that they will be self-draining where possible and practicable, and shall be of a shape that can be easily cross sectioned.

When the Contractor's excavation operations are completed the area shall have a neat appearance. All borrow areas, except those portions which are under water in the case of pits which are not self-draining, shall be covered with topsoil and stabilized in accordance with the Procedures for Providing Offsite Waste and Borrow on TDOT Construction Projects Manual.

Furnishing and placing of topsoil and seeding (with mulch) shall be performed in accordance with the provisions of **Subsection 203.06** and **Section 801**, respectively.

Furnishing and placing topsoil and stabilization of borrow areas, as specified above, shall be included in the bid cost for the project as specified in the Procedures for Providing Offsite Waste and Borrow on TDOT Construction Projects Manual.

The Contractor's attention is called to **Sections 53-801 through 53-809** of the **Tennessee Code, Annotated**, the provisions of which apply to borrow pits 1 acre (4047 m^2) or more in size that are not self-draining. Full information regarding the requirements to be complied with and the necessary permits which the property owner must secure for the construction of a pond, lake, borrow pits, etc., one acre or larger which is not constructed to drain, will be supplied upon application to the Tennessee Department of Environment and Conservation.

All existing roads within the right-of-way and not in the graded area that are to be abandoned shall be scarified, obliterated, top-soiled, and seeded. Scarifying and obliterating the pavement

will not be measured and paid for directly, but the cost will be included in the cost of other items. Topsoil will be measured and paid as outlined in **Section 203.09** and **203.10.** Seeding, in accordance with **Section 801** of these Specifications, will be measured and paid for under the item for Seeding.

When additional material is paid for under the item for Road and Drainage Excavation(Additional Material) and additional clearing and grubbing is required, the additional clearing and grubbing will be measured and paid for by the acre (hectare), provided the item for Adjusted Clearing and Grubbing is in the Contract, or as negotiated. No additional payment will be made for extra handling of stockpiled topsoil made necessary by the use of the item for Road and Drainage Excavation (Additional Material).

Subsection 203.05-Undercutting. Add the following as the last sentence of the first paragraph:

If undercutting material is to be disposed of off rights-of-way, disposal shall be conducted in accordance with the Procedures for Providing Offsite Waste and Borrow on TDOT Construction Projects Manual, and the site to be used for disposal must be approved in advance by the Project Supervisor, Environmental Coordinator, and the Environmental Division.

Subsection 203.06-Stripping, Stockpiling and Placing Topsoil. Revise the first paragraph to the following:

203.06-Stripping, Stockpiling and Placing Topsoil. The Engineer will designate areas between slope stake points in both cut and fill from which the existing topsoil shall be stripped and stockpiled. The quantity of topsoil to be stripped shall be sufficient to provide, over all areas to be seeded, a depth of 2 to 3 in. (50 to 75 mm) of the material. If the quantity of topsoil available in such areas is insufficient, the Contractor shall make up the deficiency with topsoil from an approved borrow area in accordance with the Procedures for Providing Offsite Waste and Borrow on TDOT Construction Projects Manual. The quantity of topsoil from such a source shall be measured by cross sectioning the area before and after removal.

Subsection 203.07-Disposal of Excess or Unsuitable Material. Revise the entire subsection to the following:

203.07-Disposal of Excess or Unsuitable Material. Excess excavation material shall be used to raise, widen or flatten the slopes of embankments; to fade embankments into cuts; or be placed in such other locations and for such purposes as the Engineer may direct.

Specific instructions will be given by the Engineer regarding the disposal of surplus material. Excess or unsuitable material placed within the rights-of-way limits shall be placed and compacted in accordance with **Subsection 205.04**. Foundation preparation for and drainage through these waste areas shall be equivalent to that provided for the adjacent roadway embankment.

If no suitable place can be found to dispose of excess or unsuitable material within the limits of the rights-of-way, the Engineer may direct the Contractor to provide a suitable site off the rights-of-way at no additional cost in accordance with the Procedures for Providing Offsite Waste and Borrow on TDOT Construction Projects Manual.

Furnishing and placing topsoil and seeding waste areas inside the Rights-of-Way shall be measured and paid for at the contract unit prices bid for the respective items. Furnishing and

placing topsoil and seeding on waste areas outside the Rights-of-Way in accordance with the above provisions will not be paid for directly, and the costs thereof shall be included in the unit price bid for other items of construction.

When waste material is placed off the rights-of-way which, in the judgment of the Engineer, are so removed from the rights-of-way as to not constitute a potential threat to the stability of the project, the contractor should follow the requirements outlined in the Procedures for Providing Offsite Waste and Borrow on TDOT Construction Projects Manual to ensure the waste area is properly designed, regulated, and implemented.

Subsection 203.09-Method of Measurement. Delete the next to the last paragraph which begins with, "Overhaul of Road and Drainage Excavation".

Subsection 203.10-Basis of Payment. Delete the last paragraph.

Subsection 204.02-Classification (g) Bedding Material for Support for Pipe Culverts. **Add** the following sentence to (g):

"Payment for Type "A" or Type "B" backfill including bedding material will be included in the unit price of the pipe unless otherwise specified in the plans."

Subsection 204.06 Add the following before section (a)

"The contractor shall submit for approval a proposed mix design in accordance with **Subsection 604.03."**

Subsection 204.06 (a), second paragraph, **Delete** the first sentence and replace with the following:

"The above Specification Limits may be adjusted by the Engineer to obtain the consistency required for satisfactory flow."

Subsection 204.08-Excavation (a) and (c). Replace Subsection (a) and (c) with the following:

(a) Bridges, Box Culverts and Other Major Structures.

Before excavation is started the Engineer or Contractor when required, will set stakes locating and outlining the structure and cross section for excavation computations. The Contractor will also use highly visible markers to mark disturbed area and undisturbed area limits. Highly visible markers must be readily visible to project personnel including equipment operators. No excavation shall be started prior to that time.

All structure excavation shall be cut to the lines and elevations indicated on the Plans, or as directed by the Engineer. Working variations outside the neat lines will be permitted; however, only that excavation outlined under **Subsection 204.12** will be measured for payment.

No excavated materials shall be deposited or disposed of outside the construction lines unless directed and approved by the Engineer in accordance with the Procedures for Providing Offsite Waste and Borrow on TDOT Construction Projects Manual.

When solid rock is encountered in roadway cut sections and channel sections under bridges, presplitting operations shall be performed in accordance with the provisions of **Subsection 203.04**. Hole spacing along bridge abutment sites shall not exceed 12 in. (30 cm). Where overshooting of rock, beyond the cut sections shown on the bridge plans

cause modification of bridge abutments or span lengths, such modifications shall be made at the contractor's expense.

Inclined surfaces of rock used as foundation shall be excavated either level or in steps. When necessary, as determined by the Engineer, to obtain good bond, the surface of rock foundation shall be roughened, or suitable anchors installed. Over-excavations that require re-design, or increased bridge length and/or quantities, or supplemental retaining walls or other earth retaining structures shall be paid at the expense of the Contractor.

Existing concrete foundations, boulders, or ledge streaks of rock projecting into the bottom of the excavation shall be removed to a depth of 6 in. (15 cm) below foundation elevation, and the space backfilled with approved material and thoroughly compacted.

Excavation below bridge foundation elevations as given shall be done only upon direction of the Engineer. All materials moved without such authority shall be replaced by the Contractor without compensation by constructing a sub-footing of the same materials as the footing of the structure unit and 6 in. (15 cm) wider on every side.

(c) Utilization of Excavated Materials.

All suitable excavated material shall be utilized as backfill or embankment. Excess or unsuitable material shall be disposed of in such a manner as not to obstruct the stream or otherwise impair the efficiency or appearance of the structure. No excavated material shall be deposited at any time in such a manner as to endanger a partly finished structure.

The Contractor shall handle and deposit excavated materials in such a manner as to furnish proper protection to materials which will be incorporated in the structure.

In streams, the disposal of material will be subject to the laws of the U.S. Government and requirements set out in the TN Construction General Permit and any other applicable environmental permits.

Subsection 204.09-Protection of Excavation. Replace the entire subsection with the following:

204.09-Protection of Excavation. The Contractor will be held responsible for protecting his excavation and shall take every precaution to maintain the excavation intact.

Cofferdams or cribs, used in the preparation and protection of the foundation, in general, shall be carried well below the bottom of the footings, shall be substantially braced in all directions; and shall be of such construction as will permit them to be pumped and maintained free of water until the construction therein has been completed. All dewatering of work areas of must comply with the requirements of the TN Construction General Permit and shall not cause a water quality violation. Unless otherwise specifically indicated on the Plans, the interior dimensions of the cofferdam will be such as to give sufficient clearance to provide for the construction and inspection of forms; and to provide for the handling and pumping of leakage outside of the footing area. Cofferdams or cribs which tilt or move out of position during the process of sinking shall be righted or enlarged in order to provide the necessary clearance.

Cofferdams or cribs shall be so constructed as to protect the foundation and the construction therein against damage from a rise in the stream.

Timber, or bracing of a cofferdam or crib may extend into or through the substructure only with the written permission of the Engineer, obtained before the construction of the cofferdam or

crib has been started. In addition, the cofferdams for structure widening shall not be braced off of the existing structure.

The Contractor shall submit drawings, prepared by and stamped by a Professional Engineer licensed in Tennessee, showing details of his proposed cofferdam, or crib construction to the Engineer, prior to starting any work. The type and clearance of cofferdams, or cribs, insofar as they affect the finished structure or part thereof, will be subject to the approval of the Engineer but the design and successful construction shall be the responsibility of the Contractor. Work in a stream shall not begin until applicable permits from state and federal agencies have been obtained. Coffer dam construction shall be in accordance with the requirements of the permit(s).

Cofferdams or cribs, with all falsework, sheeting, bracing, etc. shall be removed by the Contractor after the completion of the sub-structure therein, unless otherwise directed. The removal shall be affected in such a manner as not to disturb nor mar the completed work.

If the foundation excavation has become disturbed or distorted, it shall be cleaned out and restored to satisfactory condition at the Contractor's expense.

Subsection 204.10-Foundation Preparation. Replace the entire subsection with the following:

204.10-Foundation Preparation.

(a) Bridges, Box Culverts, and Other Major Structures.

The preparation of foundations for bridges, box culverts and other major structures, in addition to the stipulations set out in **Subsections 204.08** and **204.09**, shall be in accordance with the following:

When the foundation has been completed to foundation elevation as given, the Engineer shall be notified and the construction therein withheld pending his inspection and approval of the foundation.

When directed by the Engineer, unless piles are indicated, the Contractor shall test each foundation in the presence of the Engineer, by sinking not less than 3 holes, or more than 6 holes to a depth of between 6 and 10 ft. (1.8 and 3 m) in order to verify the apparent conditions of the foundations.

Should these test holes disclose unsatisfactory foundation conditions, the excavation shall be carried lower, as directed by the Engineer, and new tests made, until a satisfactory foundation is secured. The costs incurred in sinking test holes will not be paid for directly but shall be included in the price bid for other items of construction unless specified otherwise on the Contract drawings.

When rock is encountered in the excavation for the foundation, it shall be cleared off and the Engineer notified. Test holes shall then be drilled in the rock as shown on the Plans or directed by the Engineer to determine the lines of demarcation, the classification and the stability of the rock. The excavation shall then be continued to the elevation designated by the Engineer and test holes, if required by the Engineer, shall again be drilled and excavation continued until a foundation approved by the Engineer is secured.

Rock used as foundation shall be stripped and cleaned of all overlying materials. All loose, disintegrated, or light slabby portions of the rock shall be removed.

In rock foundations, when the rock is shattered below the foundation elevation, the shattered material shall be removed and the space so created rebuilt with the same type of

construction as the proposed overlying construction. The additional quantities thus made necessary shall not be included in the pay quantities for this item.

When the Plans indicate that piles shall be driven, or if after the foundation excavation has been completed it becomes necessary to reinforce the foundation by driving piles therein, any bulge of the foundation material, caused by the driving of the piles, shall be removed at the Contractor's expense, to the elevation indicated or directed and the foundation trued to an even surface over its entire area.

Unsatisfactory material in the foundation shall be removed and replaced with satisfactory material designated by the Engineer. This material shall be placed in layers not exceeding 6 in. (15 cm) in loose depth and compacted to 100 % of maximum density up to the foundation elevation.

Any pumping that may be permitted from the interior of any foundation enclosure shall be done in such a manner as to preclude the possibility of any portion of concrete material being carried away. Any pumping required during the placing of concrete, or for a period of at least 24 hours thereafter, shall be done from a suitable sump located outside the concrete forms. All dewatering of work areas must comply with the requirements of the TN Construction General Permit and shall not cause a water quality violation.

When conditions are encountered which render it impracticable to dewater the foundation before placing the footing, the Engineer may permit the construction of a concrete foundation seal of such dimensions as he may consider necessary and of such thickness as to resist any possible uplift. Before pouring the seal, the foundation shall be cleaned of all objectionable material by the use of sand pumps, spud bars or other means which will accomplish the purpose satisfactorily. The seals shall then be constructed in accordance with the provisions of **Subsection 604.19.** Pumping to dewater a sealed cofferdam shall not commence until the seal has set sufficiently to withstand the hydrostatic pressure. The foundation shall then be dewatered and the seal thoroughly cleaned of all laitance and generally prepared for further construction.

Measurement and payment for concrete foundation seal will be as provided for under **Subsections 604.31** and **604.32** except as provided for in 204.13.

(b) Pipe Culverts.

Bedding for pipe culverts shall conform to the requirements given below for Class A, B, or C bedding, whichever is shown on the Plans or in the special provisions. If the class of bedding is not shown, Class C bedding shall be placed.

Class A bedding for pipe culverts shall consist of a continuous concrete cradle constructed in conformity with the details shown on the Plans and the applicable requirements of **Section 604** (Concrete Structures).

Class B bedding shall be constructed by bedding the culvert pipe in a trench cut in natural ground or compacted embankment to a depth as shown on the Plans. The pipe shall be bedded on a 6 in. (15 cm) thickness of Class B Material and sufficient additional Class B material accurately shaped by a template to fit the lower part of the pipe exterior for at least 10% of its overall height. Class B material shall then be rammed and tamped in layers not over 6 in. (15 cm) in loose thickness around the pipe to a minimum depth of that shown on the Plans. The remaining depth of trench shall then be backfilled and compacted as outlined in **Subsection 204.11(b)**. When bell and spigot pipe is to be placed, recesses shall be dug in the bedding material of sufficient width and depth to

accommodate the bell without its resting on the bottom of the recess. The width of the recess shall not exceed the width of the bell by more than 2 in. (50 mm).

When plastic pipe is to be placed, the bedding and backfill shall be granular compactable Type "A" or Type "B" Aggregate, Grading D or E material meeting the requirements of **Subsection 903.05**. Open graded aggregates will not be allowed. A minimum of 6 inches of bedding compacted to a minimum 90% Standard Proctor Density shall be provided prior to placement of the pipe unless otherwise specified.

Class C bedding shall be constructed by bedding the culvert pipe in a shallow trench cut in natural ground or compacted embankment to a depth of not less than 10% of the outside vertical pipe diameter, and shall be shaped to fit the lower pipe exterior for the specified embedment. When bell and spigot pipe is to be placed, recesses shall be dug in the earth foundation of sufficient width and depth to accommodate the bell without its resting on the bottom of the recess. The width of the recess shall not exceed the width of the bell by more than 2 in. (50 mm).

When flowable fill is required by the plans, class B bedding shall be constructed by bedding the culvert pipe in a trench cut in natural ground or compacted embankment to a depth as shown on the Plans. The pipe shall be bedded on a 6 in.(15 cm) thickness of Class B Material and sufficient additional Class B material accurately shaped by a template to fit the lower part of the pipe exterior for at least 10 % of its overall height. Flowable fill shall then be placed around the pipe as specified in **Subsection 204.11(c).**

Subsection 204.11 Backfilling, (b) Pipe culverts. **Add** The following as the third paragraph:

"When plastic pipe is to be placed, structural backfill must be worked into the haunch area and compacted by hand after placement of the pipe. Special compaction means may be necessary in the haunch area. Structural backfill may then be placed in layers not to exceed an 6 inch loose lift thickness and brought up evenly and simultaneously on both sides of the pipe to an elevation not less than one foot above the pipe. A minimum compaction level of 90% Standard Proctor Density per *AASHTO T99* shall be achieved by the use of a vibratory plate. Hydrohammer type compactors shall not be used over the pipe. All compaction equipment used shall be approved by the Engineer."

204.12-Method of Measurement. Add the following as the last paragraph:

"Payment for Type "A" or Type "B" backfill including bedding material will be included in the unit price of the pipe."

204.13-Basis of Payment, (h) Concrete for Class A Bedding. **Remove** paragraph and **replace** with the following:

"Payment for Type "A" bedding material will be included in the unit price of the pipe unless otherwise provided in the plans. If specified by the plans, concrete for Class A Bedding will be paid for at the contract unit price per cubic yard (m3) for Bedding Material (Pipe) Class A, complete in place."

204.13-Basis of Payment, (i) Material for Class B Bedding. **Remove** paragraph and **replace** with the following:

"Payment for Type "B" bedding material will be included in the unit price of the pipe unless otherwise provided in the plans." If specified by the plans, material for Class B Bedding will be

paid for at the contract unit price per cubic yard (cubic meter) for Bedding Material (Pipe) Class B, complete in place.

204.13-Basis of Payment, (l) Backfill Material (Flowable Fill). **Add** the following as the last paragraph:

"Payment for "Flowable Fill" as backfill material for pipe shall be included in the unit price of the pipe unless otherwise provided in the plans."

Subsection 205.01 Description. Revise the entire subsection to the following:

205.01-Description. This work shall consist of constructing roadway embankments, including preparation of the area upon which they are to be placed; the construction of dikes within or outside the rights-of-way; the placing and compacting of approved material within roadway areas where unsuitable material has been removed; and the placing and compacting of embankment material in holes, pits, and other depressions within the roadway area all in accordance with these Specifications and in reasonably close conformity with the lines, grades, and typical cross sections shown on the Plans or established by the Engineer. Only approved materials shall be used in the construction of embankments and backfills. These materials shall consist of Road and Drainage Excavation, Channel Excavation, and Borrow Excavation material described in **Section 203**, or excess material as described in **Section 204**.

The Contractor must identify both natural and created steep slope areas as defined in the TN Construction General Permit. These slopes must be marked in the SWPPP. Maintenance and stabilization of steep slopes must comply with the TN Construction General Permit and any other applicable environmental permits.

Subsection 205.04 Insert the following, between the fifth and sixth paragraph:

"Where the contract includes the placement of base stone or other components of a pavement structure upon the subgrade, the top 6 in. (150 mm) in both cut and fill sections shall be compacted to a density equal to 100 percent of the maximum density in accordance with the provisions of **Subsection 207.04.**"

Subsectin 206.03-Method and Scope of Work. Revise the entire subsection to the following:

206.03-Method and Scope of Work. Final Dressing shall be performed by hand work and machines to produce a uniform satisfactory finish to all parts of the roadway and other components of the project. The roadbed, shoulders, ditches and slopes shall be shaped within reasonably close conformity to the specified lines, grades and cross sections. Spoil banks, borrow areas, waste areas, etc. shall be dressed in a satisfactory manner in accordance with the Procedures for Providing Offsite Waste and Borrow on TDOT Construction Projects Manual. Rock cuts shall be scaled of all loose fragments and left in a neat, safe and workmanlike condition.

The entire rights-of-way shall be cleaned of all weeds, briars and brushes unless otherwise specified on the Plans. All structures, both old and new, shall be cleared and cleaned of all brush, drifts, heavy vegetation, sediment, rubbish, obstructions and other objectionable material.

Final dressing shall be performed prior to sodding and seeding operations when these construction items are included in the Contract.

Tracked machines used in the dressing of slopes shall be run up and down slopes as opposed to longitudinally.

Section 209, Revise Section title to the following:

SECTION 209-PROJECT EROSION PEVENTION AND SEDIMENT CONTROL

Subsection 209.01, Revise entire Subsection to the following:

209.01-Description. This work shall consist of temporary and permanent best management practices to prevent erosion and control sediment through the use of structural and non-structural controls.

Erosion prevention and sediment control (EPSC) measures shall be implemented during all phases of construction, including all approved waste and borrow areas. EPSC measures shown on the Stormwater Pollution Prevention Plan (SWPPP) must be in place before any soil disturbing activities begin.

The Contractor must identify both natural and created steep slope areas as defined in the TN Construction General Permit. These slopes must be marked in the SWPPP. Management and stabilization of steep slopes must comply with the TN Construction General Permit and any other applicable environmental permits.

In addition to installing the EPSC measures included in the SWPPP, the Contractor is responsible for compliance with all other provisions of the SWPPP. Additional EPSC measures beyond those shown in the SWPPP may be required to maintain compliance with permits

Subsection 209.02, Revise Subsection to the following:

209.02-Classification. Structural and Non-Structural best management practices will be classified in accordance with manual for Management of Storm Water Discharges Associated with Construction Activities. Best management practices are structural and non-structural controls required for the project and shall be implemented in accordance with the TN Construction General Permit, Manual for Management of Storm Water Discharges Associated with Construction Activities, the project Stormwater Pollution Prevention Plan, and Roadway Standard Drawings, whichever is more restrictive.

Subsection 209.04, Revise entire Subsection to the following:

209.04-Project Review. Prior to the preconstruction conference the Contractor shall meet with the Engineer to discuss potential problems with erosion prevention and sediment control due to construction activities and actions to be taken to prevent such problems. Should the Contractor's operations and construction staging differ significantly from the SWPPP prepared for the project, the Contractor shall prepare a comprehensive SWPPP in accordance with **Subsection 209.05** below that does not conflict with the requirements of the TN Construction General Permit, the conditions of any ARAP for the project, or other environmental permits. The SWPPP shall be continuously implemented to effectively control erosion and protect streams, wetlands, and adjoining properties during the term of the contract.

If it is determined that a waste or borrow area is needed, the Contractor shall prepare a waste and borrow plan in accordance with the Procedures for Providing Offsite Waste and Borrow on TDOT Construction Projects Manual.

Subsection 209.05, Revise entire Subsection to the following:

209.05-Preconstruction Conferences. Each project will have a preconstruction conference. In addition to the preconstruction conference, for sites that have environmental permits, an environmental preconstruction conference will be held. These conferences can be held jointly or separately, as determined by the Project Supervisor.

At the preconstruction conference the Contractor shall submit for acceptance his plan for the staging of his operations. If the staging plan requires additional erosion prevention and sediment control measures or causes the existing SWPPP for the project to be modified, the Contractor shall submit these modifications to the project Supervisor and discuss the modificaitons during the preconstruction conference. The staging plan must address: (1) All areas within the rights-of-way as are applicable for clearing and grubbing, grading, bridges and other structures at water courses, paving and incidental construction (2) Areas outside the rights-of-way that will be disturbed by the construction such as waste and borrow areas (which must have an approved waste and borrow plan and be properly permitted), haul roads, utilities, and staging areas, and utility work in general. The Contractor's modified SWPPP shall incorporate and supplement, as applicable, the basic control devices shown in the plans to provide acceptable temporary and permanent erosion prevention and sediment controls during all stages of construction as well as to comply with all applicable environmental permit conditions. The Contractor's modified SWPPP shall include controls for managing and stabilizing natural and created steep slope areas as defined in the TN Construction General Permit. No work shall be started until the erosion prevention and sediment control plan, including the staging of temporary and permanent erosion control measures, has been accepted by the Engineer. Rejection of all or part of the plan shall not constitute a basis for an extension of contract time.

The Project Supervisor and Contractor will discuss how utilities are to be managed on the project, specifically if the utilities are within the Construction contract or are separate from the Construction contract. The Prime Contractor will coordinate a start date for utilities with the Project Supervisor if utility work will begin before the project start date. Unless approved in advance by the Project Supervisor, utilities that are within the Construction contract cannot begin construction on the project until the Project Supervisor has approved the work.

The erosion prevention and sediment control plan shall be updated as work progresses to show changes due to revisions in work schedules or sequence of construction, or when directed by the Engineer. Additional measures shall be installed in the field as needed to manage erosion and sediment and to prevent pollutants from discharging into waters of the state or off the project.

An environmental preconstruction conference will also be held prior to beginning construction on sites that have environmental permits. The environmental preconstruction conference will include a review of the project's environmental permits and any additional environmental commitments required for the project. This meeting will discuss the required marking of clearing limits and the marking of sensitive environmental areas per any applicable environmental permits. The Contractor will discuss potential problems with implementing the requirements of any environmental permits due to construction activities. The Contractor shall also discuss actions to be taken to prevent conflicts between environmental permits and construction activities.

Subsection 209.06, Revise entire Subsection to the following:

209.06-Construction Requirements. Disturbed area limits and environmental boundaries shall be marked in the field prior to construction in each section or portion of the project. Prior to or simultaneously with the clearing and grubbing operations, the Contractor shall install erosion prevention and sediment control devices in accordance with the approved SWPPP. Such work may involve the construction of temporary berms, dams, silt fences, sediment basins, lined channels, permanent cut-off ditches, slope drains or other control devices as necessary to prevent and control erosion. Water from cofferdams or other dewatering activities is not to be pumped directly into streams, but is to be pumped into sediment basins, traps, or filter bags or otherwise adequately treated prior to discharging. No grading shall be performed until the erosion prevention and sediment control devices are in place to the satisfaction of the Engineer. Areas to be graded may be cleared and grubbed prior to beginning grading operations in accordance with the TN Construction General Permit, provided adequate controls are in place. Stockpiled topsoil or fill material is to be protected so the sediment runoff will not contaminate surrounding areas or enter nearby streams. In order to reduce sediment in runoff, erosion prevention and sediment control structures shall be installed promptly during all construction phases and maintained until the areas they are serving have been permanently stabilized.

The Contractor must identify both natural and created steep slope areas as defined in the TN Construction General Permit. These slopes must be marked in the SWPPP. Management and stabilization of steep slopes must comply with the TN Construction General Permit and any other applicable environmental permits.

The Contractor's operations shall be staged so that graded or otherwise disturbed erodible surfaces are protected as the work progresses. Once the Contractor begins grading for a roadway cut or embankment, he shall maintain a continuous, viable operation to complete the cut or embankment to subgrade elevation, unless otherwise approved in writing by the Engineer. Exposed erodible cut or embankment slopes shall be final dressed, topsoiled and protected with permanent seeding, sodding, matting or other acceptable erosion prevention and sediment control measures in vertical increments not exceeding 25 ft. (7.5 m) as the work progresses; and no portion of these slopes shall remain unprotected longer than allowed by the TN Construction General Permit unless the Engineer determines that weather conditions or other special circumstances preclude current placement of permanent control measures. Temporary erosion control measures shall be implemented as directed by the Engineer.

Seeding, sodding, matting or other acceptable erosion prevention and sediment control operations shall be initiated within 48 hours after any one of the following conditions occurs:

1. Each 25 ft. (7.5 m) vertical increment is graded or
2. Upon suspension or completion of grading operations in a specific area.

The above requirements for progressive erosion prevention and sediment control, as well as additional requirements, also apply to graded areas off the rights-of-way such as waste areas, borrow areas and haul roads. A borrow and waste site plan must be developed for any waste or borrow area selected according to Statewide Storm Water Management Plan – Procedures for Providing Offsite Waste and Borrow on TDOT Construction Projects.

The Contractor shall incorporate all permanent erosion prevention and sediment control practices into the project at the earliest practicable time and in accordance with the TN Construction General Permit requirements. Temporary erosion prevention and sediment control features shall be used to control erosive conditions that warrant protection prior to installation of

permanent control features or that are needed to temporarily control erosion that develops during construction but which is not associated with permanent control features on the project. Temporary stabilization of disturbed areas shall be in accordance with the requirements of the TN Construction General Permit.

Where construction activities cross or border areas of depression (i.e. Sinkholes without openings or open throats), erosion prevention and sediment control measures shall be installed and maintained as shown in the plans and as required by the TN Construction General Permit and any other applicable environmental permits.. When construction activities encounter an open throated sinkhole (Class V Injection Well), the Engineer shall be notified immediately and applicable measures as described in the approved SWPPP shall be employed. The measures mentioned above shall encircle the sinkhole opening so as not to allow any silt or other potential pollutants to enter the opening.

In the event of conflict between these requirements and TN Construction General Permit, rules or regulations of other Federal or State or local agencies, the more restrictive laws, rules or regulations shall apply.

Subsection 209.07-Construction of Structures. Revise entire subsection to the following:

209.07-Construction of Structures Structural controls include, but are not limited to, bonded fiber matrix, riprap, inlet protection, check dams, silt fence, and sediment basins. Structural measures shall be installed and maintained in accordance with the Manual for Management of Storm Water Discharges Associated with Construction Activities, TN Construction General Permit, and the Roadway Standard Drawings.

Erosion prevention and sediment control measures shall be installed as indicated on the Roadway Standard Drawings, except as follows:

(a) **Sediment Filter Bags.**

The sediment bags may be utilized either on slope drains, pipe culverts, box bridges, or for pumping sediment from sediment traps and sediment basins. This activity shall be performed as shown on plans or as directed by the Engineer. The material shall be a non-woven geotextile fabric bag resistant to rot, mildew, puncture and tearing, with a minimum seam breaking strength of 200 lbs (90 kgs) the seams shall demonstrate less elongation and Deformation of the geotextile fabric. The Division of Materials and Test will certify the fabric for the Temporary Sediment Filter Bags and place them on the Department's Qualified Products List. Temporary Sediment Filter Bags shall meet the following specifications.

GEOTEXTILE FABRIC SPECIFICATIONS

Properties		Test Method
Weight	10.0 oz/yd	ASTM D 3776
Tensile Strength	250 lbs.	ASTM D 4632
Tensile Elongation at Break	50%	ASTM D 4632
Puncture Strength	115 lbs.	ASTM D 4833
Trapezoidal Tear	100 lbs.	ASTM D 4533
Mullen Burst	350 lbs.	ASTM D 3786

Water, Flow Rate	80 gpm/ft.2	ASTM D 4491
Permittivity	1.2 sec.-1	ASTM D 4491
UV Resistance	70% str. Ret.	ASTM D 4355

Standard Bag Minimum Dimensions
15 x 10 ft. and 15 x 15 ft.

Maximum Flow Rate
15 x 10 ft. up to 1,500 gpm
15 x 15 ft. up to 2,000 gpm

A manufacturer's label designating the maximum allowable flow rate of the bag in gallons per minute shall be permanently attached to each bag. The flow into the filter bag shall not exceed the designated flow rate. Care shall be taken to correctly connect the filter bag to the pump hose, as recommended by the manufacturer. Upon project completion, the sediment filter bag shall be completely removed and the disturbed areas at the dewatering structure location shall be permanently stabilized. The bag and sediment contained in the bag shall be disposed as directed by the Engineer.

(b) Sandbag Berms and Temporary Plugs.

Sandbag berms and temporary plugs may be used for velocity control, runoff management, sediment control and separating streamflow from work areas. These sandbag measures should not be used for filtration. Sandbag berms and temporary plugs should not be used in high concentrated flow areas where the sand bags may be displaced by flow. Sandbags should not be used in areas where equipment and/or traffic may damage the bags. The ends of sandbags must be tightly abutted and overlapped to direct flow away from bag joints.

Sandbags for the sandbag berms and channel plugs shall be made of durable, weather resistant geotextile fabric. Use of burlap is not acceptable for sandbags used in sandbag berms and temporary plugs. The bag fabric pores must be tight enough to retain the bag filler material. Typical bags measure approximately 24 inches x 12 inches x 6 inches. The sandbag fill material shall be a clean non-cohesive sand material.

Where sandbags are used to construct sandbag berms or temporary plugs across a ditch or channel, the sandbags should be installed along a level contour. The sandbags at the ends of the measure should be turned upstream.

Sandbag berms may be installed in both unpaved and paved ditches and channels. The sandbag berm must be wider than the high water mark of the ditch or channel to prevent undercutting. The center of the sandbag berm must be lower than either of the edges. For multiple sandbag berms installed in ditches, the maximum spacing between the berms should be such that the toe of the upstream sandbag berm at the same elevation as the top of the downstream sandbag berm.

Sandbag temporary plugs are constructed to separate stream flow from work areas, especially for projects requiring temporary diversions. Sandbag temporary plugs shall be constructed as required for the temporary diversion. The temporary plugs should be constructed as appropriate to be free of leaks between the bags.

Sandbags shall be removed and replaced if bags become torn or damaged to prevent the bag filler material from becoming a stormwater pollutant. Remove any sediment accumulations at sandbags when the sediment accumulation has reached half the original height of the sandbags. Where the ends of sandbag structures are breached, place new bags in the breach and extend the ends of the berm to a higher elevation. If needed, repair the bank damage. Where sandbags are undermined, do not repair the sandbags in place as additional undermining may occur. Move the sandbags downstream of the damaged location.

Upon project completion, all sandbags shall be removed and any disturbed areas underlying the sandbags shall be permanently stabilized with measures such as permanent seed and mulch.

(c) Flocculants .

This work shall consist of furnishing and applying flocculant materials for controlling erosion on disturbed areas and for use with sediment control devices for the purpose of reducing turbidity from stormwater runoff. Flocculant materials shall be manufactured and applied in strict accordance with the Specifications herein.

Equipment

All equipment necessary for the satisfactory performance of this work shall be on the project and approved, before work will be permitted to begin.

If using a liquid application system, it may be necessary to pump a surfactant through the delivery system prior to liquid flocculant injection and afterwards in order to prevent clogging of pipes and valves.

After application of flocculant materials, all equipment used for application shall be cleaned per the flocculant manufacturer's recommendations in order to prevent the formation of dried residues that may impede future equipment performance.

Applications of dry flocculant materials shall be performed with a hand-held fertilizer spreader or a tractor-mounted spreader. If approved by the flocculant manufacturer, the mixing of certain dry flocculants with dry silica sand will aid in the spreading of flocculant material.

Limitations

Cationic PAM blends will not be approved for use and shall not be applied in any circumstance due to aquatic toxicity.

Flocculants shall never be applied directly to streams, wetlands, or other natural water resources. Flocculants shall never be applied directly to sediment ponds. Flocculants applied to any area of the construction site, including slopes, shall be applied in such a manner so that all flocculant-applied runoff flows into a sediment trap, sediment pond, or series of multiple sediment-control BMPs prior to discharge from the site. Flocculants shall not be applied to slopes that produce runoff directly into a stream, wetland, or other natural water resource. Flocculants for both erosion and sediment control shall always be used in conjunction with approved stormwater BMPs, as given in the TDOT Standard Drawings.

Dry flocculant applications must be applied in dry weather conditions with light winds. Anionic PAM shall not be applied during rainfall or onto saturated soils.

All flocculant applications shall be applied at least 60 feet from any stream, wetland, or other natural water resource located on or adjacent to the construction site.

Emulsion forms of coagulant/flocculants should never be applied directly to stormwater runoff or to streams, wetlands, or other water resources due to surfactant toxicity. Emulsions may only be used in the preparation of liquid flocculants specifically used for erosion control applications, i.e., soil binders and tackifiers.

Preparation of Treatment Areas

Prior to use of flocculants, site-specific soil samples must be obtained and tested to identify the optimum flocculant blends to use for effectiveness. The Contractor shall provide site specific soils from given construction site to select an appropriate and effective flocculant blend for dry, liquid, emulsion, and brick/log flocculant materials. Soil samples must be obtained from each soil horizon to be accessed during excavation.

Application Requirements

Flocculants shall be used in conjunction with other BMPs (with the bulk of structural sediment-control BMPs, including sediment ponds, positioned down slope of the flocculant-application areas) to increase flocculant performance. Stormwater runoff from flocculant-treated soils shall be directed to pass through a series of sediment control BMPs prior to discharge to surface waters, with flow passing through, at least, a minimum of 3 enhanced rock check dams and a silt trap. It is preferable that runoff from flocculant-treated areas be directed into a sediment pond.

Flocculant materials shall be stored in covered areas. Many flocculants demonstrate a decrease in effectiveness after exposure to sunlight and air. Anionic PAM loses its effectiveness within three months after exposure to sunlight and air. Anionic PAM as well as certain other flocculant materials, when combined with water, become very slippery and can produce a safety hazard. Care must be taken to prevent spills of flocculants, in liquid, emulsion, or powder form, onto paved surfaces.

Application of flocculants will be most effective when applied as follows:

a) During rough grading operations;

b) On stockpiles and borrow areas;

c) Temporary haul roads before placement of crushed rock surface;

d) Compacted soil road base;

e) After final grading and before paving and/or final seeding;

f) Along the interior surface area of ditches;

g) Sites where work has been temporarily suspended (e.g., winter shutdown), and

h) Areas that will be mulched.

Flocculants should not be applied over surfaces of pure sand or gravel with no fines and should not be applied over snow cover.
The use of a visible tracer or colorant to visibly track flocculant application is recommended.

Liquid applications of flocculants will require the use of source water for mixing with a low turbidity (20 NTUs or less).

For turbidity reduction within sediment ponds, apply flocculants to conveyance ditches above the pond that discharge into the pond. Flocculants shall not be applied directly to pooled water within sediment ponds.

For **dewatering** and suspended solids removal of turbid pooled water within pipe tranches, silt traps, or other areas, flocculants may be introduced, in either liquid or solid forms, into the turbid water during pumping/evacuation of the pooled water. The pumping will provide turbulence for optimum mixing, with the discharge either pumped through a filter bag or jute-lined treatment ditch prior to ultimate discharge. Application rates as given in this specification for turbidity reduction for anionic PAM (and as given by the manufacturers' requirements for other types of flocculants) shall be strictly followed during dewatering.

Application requirements for the two main classifications of flocculants are as given below:

I. Anionic Polyacrylamide

Prior to use of any flocculant, the flocculant manufacturer's written application, storage, and mixing requirements and specifications shall be supplied to both TDOT and the Contractor. Anionic PAM shall be stored, handled, mixed and applied in strict accordance with the flocculant manufacturer recommendations and in strict compliance with OSHA Material Safety Data Sheet requirements, complying with all applicable federal, state, and local regulations. Proper personal protective equipment shall be used when handling the flocculant per industry, manufacturer, state, and federal regulations.

SPECIAL CARE SHALL BE GIVEN TO THE APPLICATION RATES FOR ANIONIC PAM SPECIFIED HEREIN TO ENSURE THAT THE MAXIMUM APPLICATION RATES ARE NEVER EXCEEDED. ADDING ADDITIONAL PAM BEYOND THE RATES SPECIFIED WILL NOT IMPROVE THE EFFECTIVENESS OF PAM BUT COULD PRESENT TOXICITY ISSUES TO RECEIVING STREAMS DOWN GRADIENT OF THE PAM APPLICATION ZONE.

For erosion control applications on sloped areas:

a) With hydroseeding applications, anionic PAM should be added as the last component to the hydroseeding mixture. When mixing, the Contractor shall never add water to anionic PAM. The Contractor shall add PAM at a slow rate to water. Mixing of anionic PAM for hydroseeding shall include agitation of the PAM/water mixture. The application method chosen must ensure uniform flocculant coverage to the target area.

b) The Contractor shall never use anionic PAM as the sole erosion control method for slopes; slope applications of PAM shall be accompanied with mulching.

c) For PAM tackifiers, dry PAM shall be dissolved with a known quantity of clean water in a container for several hours (preferably overnight.) PAM is to be applied at a rate in the range of 0.5 lb to 1.0 lb (maximum) per 1,000 gallons of water per acre application area via a hydro- mulch machine.

d) For soil binder applications, the Contractor shall dissolve pre-measured dry PAM with a known quantity of clean water in a container for several hours (preferably overnight.) PAM is to be applied at a rate range between 2/3 lb to 1 lb (maximum) PAM per 1000 gallons water per acre of bare soil.

e) Emulsion batches shall be mixed per the recommendations of the flocculant manufacturer to determine the proper product type and application rate to meet site-specific requirements. The chosen application method must ensure uniform coverage of the target application area.

f) When using an emulsion form of anionic PAM to slopes, apply no greater than 1.5 gallons emulsion per acre per event. Solution mixtures shall be 1.5 gallons (maximum) anionic PAM emulsion per 3000 gallons of water. Note: Water volumes that are less than 3000 gallons of water shall not be used due to increased viscosity issues.

g) The Contractor shall **s**pray the anionic PAM/water mixture uniformly across the dry soil slope until completely wetted.

h) For dry anionic PAM applications for erosion control, anionic PAM shall be applied as a powder at the following rates:

- For slopes less than 25% - Apply at 10 lbs per acre (maximum)
- For slopes greater than or equal to 25% - Apply at 20 lbs per acre (maximum)

i) Liquid anionic PAM for erosion control shall be reapplied on <u>actively worked areas</u> after a 48-hour period.

j) Liquid anionic PAM shall not be applied to the same slope area more than once in a 48-hour period and no more than 7 times in a 30-day period.

k) For inactive slope areas where anionic PAM has been applied, a reapplication shall be required once every two months.

l) **Note: Anionic PAM applications (dry or liquid) shall not exceed 200 lbs/acre per year.**

For turbidity reduction within ditches:

a) It is highly recommended that flocculant application be applied as erosion control in the watershed above the treatment ditches in conjunction with the application of flocculants within treatment ditches for turbidity control.

b) The surface area of stormwater ditches, as well as the surface area of ditch check dams, shall be lined with jute mesh.

c) Dry powder anionic PAM shall be applied over the jute mesh at a rate of 0.25 lb to 0.5 lb per 1000 square feet of ditch surface area.

d) Dry powder anionic PAM shall be re-applied to jute mesh in ditches every 3 to 5 storm events. **Dry anionic PAM application shall not exceed 4.6 lbs/1000 square feet per year.**

e) Anionic PAM bricks/logs shall be of appropriate size, shape, and number to deliver the appropriate dosage to the water within the conveyance. The flocculant manufacturer shall be consulted to provide brick/log dissolution rates and dosages.

f) Anionic PAM bricks/logs shall be located in a shaded, preferably moist, installation zone during application.

g) Anionic PAM bricks/logs shall be placed near the main flow area of the ditch, and they shall be placed at an appropriate distance above sediment ponds or traps to maximize mixing and flocculation. The manufacturer shall be consulted to provide guidance for flocculant mixing time required and block/log spacing configurations.

h) The Contractor shall install one anionic PAM brick/log for every 65 to 70 gpm of flow to be treated, unless otherwise specified by the flocculant manufacturer.

i) Unless otherwise specified by the flocculant manufacturer, anionic PAM bricks/logs are estimated to treat, on average, 475,000 to 550,000 total gallons of flow volume.

j) Stakes, mesh bags, cages, and other mechanisms to anchor bricks/logs in place shall be carefully installed to provide stability during flows and to maximize exposure of the brick/log surface area to flows.

k) Anionic PAM bricks/logs shall be replaced at least every 3 - 4 months or earlier if bricks/logs have excessive sediment/debris deposition on the outer brick/log surface area or excessive degradation of brick/log mass.

II. Miscellaneous Coagulant/Flocculant Materials

Miscellaneous flocculant materials shall include all other flocculants that are not polyacylamide blends and that have been pre-approved for use on TDOT projects through the TDOT Materials and Testing Division. Submittals of required information as given in the ***Materials*** and ***Classifications*** sections of this specification shall be strictly followed.

Prior to use of any flocculant, the manufacturer's written application, storage, and mixing requirements and specifications shall be supplied to both TDOT and the Contractor. Flocculants shall be stored, handled, mixed and applied in strict accordance with the flocculant manufacturer recommendations and in strict compliance with OSHA Material Safety Data Sheet requirements, complying with all applicable federal, state, and local regulations. Proper personal protective equipment shall be used when handling the flocculant per industry, manufacturer, state, and federal regulations.

Special care shall be given to the application rates for flocculants specified by the manufacturer to ensure that the maximum application rates are never exceeded.

For erosion and sediment control applications for sloped areas and ditches:

a) The Contractor shall strictly follow the manufacturer's requirements for application mixtures and rates.

b) With hydroseeding applications, flocculants shall be mixed in strict accordance with manufacturers written recommendations, as provided to TDOT and the Contractor.

c) Flocculants shall not be used as the sole erosion control method for slopes; slope applications of flocculants shall be accompanied with mulching. Flocculant use for turbidity reduction in ditches shall be used in conjunction with other structural sediment-control BMPs.

d) Re-application frequency and rates shall strictly follow manufacturer's written recommendations, as provided to TDOT and the Contractor.

e) Storage of flocculants shall follow manufacturers written requirements, as provided to TDOT and the Contractor.

Documentation and Maintenance

Flocculants will enhance the deposition of soil solids in downstream ditches, pipes, and ponds. These hydraulic structures shall be inspected regularly with solids routinely removed from these structures to ensure optimization of performance.

The Contractor shall provide suitable means for storing and protecting flocculants against moisture and sunlight.

TDOT field personnel shall maintain records of all flocculant applications including the following information:

a) Date, time, and specific location of application;

b) Rates of application;

c) Method of application;

d) Weather conditions, and

e) Type of flocculant applied including manufacturer name and product name.

Final Cleanup

The Contractor shall clean liquid or dry flocculant spills per the manufacturer's requirements. Flocculant mixing and application equipment shall be rinsed thoroughly with water to prevent the formation of residues. Unused flocculant mixtures should be minimized. Rinse residues can be applied to exposed slopes for erosion control. The Contractor shall dispose of excess flocculant material in compliance with federal, state, and local environmental regulations. Excess material shall not be disposed within stormwater conveyances, sewers, or streams.

The Contractor shall install and maintain all temporary erosion prevention and sediment control features and pollution prevention measures until no longer needed or permanent control measures are installed. Any materials removed shall become the property of the Contractor. In order to insure erosion prevention and sediment control structures work properly, it is imperative the sediment be removed and structural components of the measures maintained; therefore, inspection and maintenance of structures is to be performed on a regular basis. During sediment removal, the Contractor shall take care to insure that structural components of erosion prevention and sediment control structures are not damaged and thus made ineffective. If damage does occur, the Contractor shall repair the structures at his own expense. Upon complete removal of sediment traps, special ditches, etc., the area where they were constructed is to be topsoiled, seeded and mulched or otherwise stabilized.

In the event that temporary erosion prevention and sediment control measures are required due to the Contractor's negligence, carelessness, or failure to install permanent controls as a part of work as scheduled, and are ordered by the Engineer, such work shall be performed by the Contractor at his own expense. (See special provisions 107FP if applicable)

Where temporary erosion prevention and sediment control or pollution prevention work is acceptably performed and failure of all or any part of the system occurs but is not attributed to the Contractor's negligence, carelessness, or failure to install permanent controls and falls within the specifications for a work item that has a contract price, the units of work will be paid for at the proper contract prices except as noted below. Should the temporary erosion prevention and sediment control or pollution prevention work not be comparable to the project work under the applicable contract items, the Contractor shall be ordered to perform the work on a force account basis, or by agreed unit prices in compliance with **Subsection 109.04**.

Except as noted below, payment also may be made for replacement of temporary erosion prevention and sediment control and pollution prevention devices installed according to the plans or as approved by the Engineer provided such devices are no longer effective because of deterioration or functional incapacity, except that no payment shall be made for replacement of erosion prevention and sediment control or pollution prevention devices ineffective due to improper installation, lack of reasonable maintenance or because of failure of the Contractor to pursue timely installation of permanent control devices in accordance with the Plans and Specifications or as directed by the Engineer.

Unless provided for on the plans, no direct payment will be made for temporary and permanent erosion prevention and sediment control or pollution prevention measures in disturbed areas outside the rights-of-way such as borrow areas, waste areas and haul roads unless the borrow areas or waste areas are provided for by the Department, and except for permanent Seeding (with Mulch) on borrow areas and waste areas within the limitations prescribed in **Subsection 203.0**4 and **Subsection 203.07**, respectively. Where the plans show separate quantities for erosion prevention and sediment control or pollution prevention items to be used outside the rights-of-way in connection with waste areas, borrow areas or other project related construction, payment will be made for these items used and accepted to the extent of these separately listed plans quantities; but the cost of any overruns in these items, or the cost of any additional items required for erosion prevention and sediment control or pollution prevention off the rights-of-way, shall be borne by the Contractor unless prior approval in writing is received from the Engineer.

In case of failure of the Contractor to control project related erosion or the discharge of pollutants, either on or off the rights-of-way, the Engineer may withhold payment of future progress estimates until the Contractor has satisfactorily performed the necessary corrective measures. If deemed necessary, the Engineer may employ outside assistance or use his own forces to provide the needed protective measures, with all incurred direct costs plus project engineering costs being charged to the Contractor by appropriate deductions from the Contractor's monthly progress estimate.

Subsection 209.08-Revise entire subsection to the following:

209.08-Method of Measurement. Erosion prevention and sediment control devices shall be measured in accordance with the appropriate Standard Drawing or as noted below.

Temporary seeding and mulching operations will be measured in accordance with the appropriate provisions of **Subsection 801.09**.

Seeding (without Mulch) and Crown vetch mixture (without Mulch) shall be measured per unit.

The accepted quantities of Road and Drainage Excavation will be measured in C.Y. (m^3).

Sediment removal and disposal for maintaining erosion prevention and sediment control measures will be measured by the cubic yard (cubic meter).

For catch basin filter assemblies, structure maintenance including cleaning to prevent clogging is included in the price bid for the structure. Sediment removal and disposal for maintaining these assemblies is not to be measured and paid directly.

Sand bags will be measured by the square foot area of berm face.

Flocculants used for turbidity reduction will be measured and paid for by the actual weight in pounds of flocculant materials applied or, for brick or log forms of flocculant material, the brick/logs will be measured by the unit, per each. Such price and payment will be full compensation for all work covered by this section, including, but not limited to, furnishing all materials, labor, equipment and incidentals necessary to apply the flocculant materials. Flocculants used as either a soil binder or tackifier for erosion control applications shall be measured by the acre.

Subsection 209-09. Revise entire subsection to the following:

209.09-Basis of Payment. All Non-Structural Best Management Practices shall be included in the bid cost of the project.

Items used to install erosion prevention and sediment control devices include basis of payment information along with measurement information on the standard drawings. The standard drawing item numbers and measurement units shall be used for measurement and payment unless otherwise specified. All measures shall be constructed and accepted according to the applicable Standard Drawings and specifications prior to measurement and payment.

Additional information regarding basis of payment for erosion prevention and sediment control measures and components is listed below.

Unless otherwise stated on the corresponding Standard Drawings, payment for erosion prevention and sediment control measures shall include all materials and labor necessary for the measure's construction, maintenance and removal.

For catch basin filter assemblies, structure maintenance including cleaning to prevent clogging is included in the price bid for the structure. Sediment removal and disposal for maintaining these assemblies is not to be measured and paid directly.

Seeding (with Mulch), Seeding (without Mulch), Temporary Seeding (with Mulch) Crown vetch mixture (without Mulch) and Mulch items will be paid for in accordance with the appropriate provisions of **Subsection 801.10**.

The accepted quantities of Road and Drainage Excavation will be paid for at the contract unit price per C.Y. (m^3).

Sediment removal and disposal for maintaining erosion prevention and sediment control measures will be paid for at the unit price per C. Y. (m^3).

For catch basin filter assemblies, structure maintenance including cleaning to prevent clogging is included in the price bid for the structure. Sediment removal and disposal for maintaining these assemblies is not to be measured and paid directly.

Rock used for inlet and outlet control on erosion prevention and sediment control measures will be paid for at the contract unit price per ton (tonne).

Pipe used in the construction of erosion prevention and sediment control measures will be paid for in accordance with the appropriate provisions of **Subsection 607.13**.

Concrete used in the construction of spillways or other structures pertaining to sediment structures will be paid for in accordance with the appropriate provisions of **Section 703**.

Water used in preparation of the seed bed and for maintenance will paid for at the contract unit price per M.G. (1,000 gal.) (m^3) of water.

Sand bags will be counted per bag and will be paid for at the contract unit price per bag.

For flocculants, the accepted quantities, determined as provided above, will be paid for at the contract unit prices, which payment shall be full compensation for all equipment, materials, labor, and incidentals necessary to complete the work.

The Sediment Filter Bags will be paid for at the contract price bid per each for the size bag used which includes installation and/or replacement along with all materials, equipment, tools, labor, and incidentals to complete the work. Payment for removal and disposal of material from bag shall be made by the C.Y. (m^3) at contract price for sediment removal.

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

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(Rev. 01-05-10)
(Rev. (12-09-13)

Supplemental Specifications - Section 300

of the

Standard Specifications for Road and Bridge Construction

March 1, 2006

Subsection 303.08 (c) Second paragraph after (c), first sentence **Add** the word "exceeds" between the words "course" and "6 in. (150 mm)"

Subsection 303.13; Delete the second and third paragraphs and replace with the following:

> The weight of total moisture, as determined by dry weights, of the base material at the time of weighing in excess of 3 percentage points of optimum moisture content, will be deducted. When mixing is performed in a stationary plant, no direct payment for water will be made. When road mixing is performed, water added to the material during mixing at the direction of the Engineer will be made for payment.

SECTION 304-SOIL-CEMENT BASE Insert the following in the Table of Contents section of 304

"304.11-Thickness and Surface Tolerances."

Subsection 304.04 Last paragraph, add the word "be" in this section of the paragraph

"the entire section shall be reconstructed…"

Subsection 307.03b Composition of Mixtures, Revise entire subsection b to the following:

(b) Recycled Asphalt Pavement and Recycled Asphalt Shingles.

Recycled Asphalt Pavement (RAP)

The Contractor may utilize asphaltic concrete removed from a Department project or other State Highway Agency project by an approved method and stored in a TDOT approved stockpile. RAP combined with the appropriate aggregate, asphalt cement, and anti-strip additive when required shall produce a mixture that will otherwise meet all the requirements of **Subsection 903.06** and the requirements herein **Section 307**. RAP shall be allowed in each mix listed in the following table:

Mix Type	%RAP (Non-processed)	Maximum %RAP (Processed)	Maximum % RAP Processed and Fractionated	Maximum Particle size
307ACRL	0	00	-	-
307AS	0	00	-	-
307A	15	20	35	1 ½ in. (38 mm)
307B	15	30	35	1 ½in. (38 mm)
307BM	15	30	35	¾ in. (19 mm)
307BM2	15	30	35	¾ in. (19 mm)
307C	15	30	35	3/8 in. (9.5 mm)
307CW	15	30	35	½ in. (13 mm)
307CS	0	15	25	5/16 in. (8 mm)

RAP that has been crushed and screened or otherwise sized such that the maximum recycled material particle size is less than that listed in the table above prior to entering the dryer drum, shall qualify as "Processed". "Non processed" **RAP** shall be similar material that has not been crushed and screened or otherwise sized previous to its use. When RAP is processed over more than one screen, producing sources of various maximum particle size (i.e. – ¾" to ½", ½" to #4, etc.), it will be referred to as "fractionated", and larger percentages will be allowed as noted above. These increased percentages will only be allowed provided the individual fractions are introduced into the plant as separate material sources for increased control.

All mixes shall contain at least 65% virgin asphalt.

The Contractor shall obtain a representative sample from the recycled material stockpile and establish a gradation and asphalt cement content as required. The Contractor shall determine the gradation and asphalt content of the recycled material at the beginning of a project and every 2,000 tons(2,000 metric tons) thereafter. The stockpile asphalt cement content for all recycled material shall not vary by more than 0.8%. The stockpile gradation tolerance for all recycled material on each sieve is listed below.

3/8 in. (9.50 mm) sieve and larger± 10%
No. 4(4.75 mm) sieve.....± 8%

No. 8(2.36 mm) sieve.....± 6%
No. 30(600 µm) sieve .....± 5%
No. 200(75 µm) sieve .....± 4%

The mixture will be accepted for aggregate gradation and asphalt content based on extractions

A special design with asphalt content in the range of 5 to 7% shall be required where 307 C Mix is used as a surface on the shoulder.

The Contractor shall be responsible for his own sampling and testing of the planings as well as new materials for bid purposes, and for the submission of the job mix formula in accordance with Subsection 407.03. All additives shall be submitted to the Engineer for approval at the same time other materials are submitted for design verification.

If the Department has performed tests on the pavement to be cold planed, the results of all tests will be available at the Materials and Tests Division in Nashville, Tennessee during normal working hours. This information is advisory only and shall not be construed as necessarily complete nor accurate.

Where it is necessary to obtain a sample of the existing pavement for mix design, the Contractor shall mill the existing pavement to the full depth shown on the plans for pavement removal for a length of approximately 300 ft. (100 m) in an area approved by the Engineer. The removed pavement shall be replaced as specified on the plans or directed by the Engineer.

After mixing, the moisture content of the total mix shall be no more than 0.1% as determined by oven drying, and the provisions for lowering the temperature because of boiling or foaming shall not apply.

Recycled Asphalt Shingles (RAS)

Recycled Asphalt Shingles (RAS) may be included to a maximum of 5 percent of the total weight of mixture. The percentage of RAS used will be considered part of the maximum allowable RAP percentage. The ratio of added new asphalt binder to total asphalt binder shall be 65% or greater for all 307 mixes. Either the mix producer or the RAS supplier shall obtain a representative sample from the recycled material stockpile and establish a gradation and asphalt cement content as required. Shingle asphalt binder content shall be determined by AASHTO T-164 Method A, with a minimum sample size of 500 grams. The Contractor shall determine the gradation and asphalt content of the recycled material at the beginning of a project and every 2,000 tons (2,000 metric tons) of recycled material used thereafter. The stockpile asphalt cement content for all recycled material shall not vary by more than 0.8%. All RAS material shall be processed to a minimum 100 percent passing the 3/8 inch (9.5-mm) sieve and a minimum 90 percent passing the #4 (4.75-mm) sieve.

To conduct the gradation testing, a 500-700 gram sample of processed shingle material is air dried and dry sieved over the 3/8” and #4 sieves and weighed. For Mix Design purposes, the following aggregate gradation may be used as a standard gradation in lieu of determining the shingle gradation by AASHTO T30.

Sieve Size	% Passing
3/8 inch (9.5 mm)	100
#4 (4.75 mm)	97
#8 (2.36 mm)	95
#16 (1.16 mm)	80
#30 (0.60 mm)	60
#50 (0.30 mm)	50
#100 (0.150 mm)	40
#200 (0.075 mm)	30

An aggregate bulk specific gravity (G_{sb}) of 2.650 may be used in lieu of determining the shingle aggregate G_{sb} (AASHTO T84). In addition, the effective binder available for mixing with additional aggregates shall be considered as 75 % of the total binder content as determined by AASHTO T-164 described above and shall be the value listed as the RAS binder content on the Job Mix Formula.

Scrap asphalt shingle shall not contain extraneous waste materials. Extraneous materials including, but not limited to, asbestos, metals, glass, rubber, nails, soil, brick, tars, paper, wood, and plastics shall not exceed 0.5 percent by weight as determined on material retained on the 4.75-mm (No. 4) sieve. To conduct deleterious material testing, a representative 500-700 gram sample of processed shingle material shall be sieved on the #4 sieve and any extraneous waste material retained on the #4 sieve is picked and weighed. The percent extraneous is based on the total sample weight.

RAS shall contain less than the maximum percentage of asbestos fibers based on testing procedures established by TDOT, state or federal environmental regulatory agencies. A minimum of one (1) sample of processed asphalt roofing material for every five hundred (500) tons of material processed shall be analyzed for the presence of asbestos containing material.

Before a Job Mix Formula for a particular design is approved, the following shall be submitted, along with materials and paperwork required by TDOT Specification 407.03:

- Certification by the processor of the shingle scrap describing the shingle scrap content and source.
- A 1000g sample of the processed RAS material for inspection (new designs only)

RAS shall be stockpiled separate from other salvage material. Blending of RAS material in a stockpile with other salvage material is prohibited. Blending of Manufacture Waste Scrap Shingles (MWSS) and TOSS shall not be allowed. In addition, blending of a virgin sand material with the processed shingles, to minimize agglomeration of the shingle material, shall not be allowed.

All RAS supplied to a TDOT project must come from a certified shingle processor/supplier approved by TDOT Headquarters Materials and Tests.

(c) Anti-Strip Additive - Asphaltic concrete mixtures (Grading A, AS, ACRL, B, BM, BM2, C, CS and CW) shall be checked for stripping by the following methods:

1. The Ten Minute Boil test for dosage rate and the Root-Tunnecliff procedure (ASTM D 4867) for moisture susceptibility.
2. For mixtures not requiring design - the Ten Minute Boil test for dosage rate and moisture susceptibility.

   * Root-Tunnecliff procedure (ASTM D 4867) shall not be used with the following mixtures: Grading A, AS, ACRL and B

If moisture susceptibility is indicated, then an approved anti-strip agent shall be mixed with the asphalt cement at the dosage recommended by the respective test and as specified in **Subsection 918.09(B).**

Subsection 307.08 Method of Measurement, Revise entire subsection to the following:

307.08-Method of Measurement. Aggregate and Asphalt Cement for Bituminous Plant Mix Base (Hot Mix) will be measured by the ton (metric ton) in accordance with the provisions of **Subsection 407.19**. Materials for prime or tack coat, if specified, will be measured as prescribed in **Section 402** or **403**, respectively.

If recycled mix is permitted, the completed mix, including new mineral aggregate, planings, asphalt cement and additive, shall be measured by the ton (metric ton) in accordance with **Section 109**. For bidding purposes, the asphalt cement content of the specified mixes shall be used in the chart below:

Mix Type	Asphalt Content
307 A	4.0%
307 B	4.3%
307 BM	5.0%
307 BM2	5.0%
307 C	5.0%
307 CW	6.0%
307 CS	6.5%

In the event that the Engineer sets an asphalt content other than that stated above, a price adjustment will be made based on the asphalt content set by the Engineer and the Monthly Bituminous Index for the specific grade asphalt on the mix design. The price adjustment will be calculated according to the following formula:

PA = [MBI x (DA-BA) x T] / 100

Where:

PA = Price Adjustment
MBI = Monthly Bituminous Index
DA = Percent asphalt set on the mix design
BA = Percent asphalt specified above to be used for bidding
T = Total tons(metric tons) asphalt mix for price adjustment

The liquid anti-strip additive will be measured by the gallon(liter) and paid as outlined in **Subsection 307.09**. Hydrated Lime will be measured by the ton (metric ton) and paid as outlined in **Subsection 307.09.**

No direct payment will be made for polymer or latex additives and cost thereof shall be included in the price bid for the modified asphalt cement or modified mixture.

Subsection 309.13; Delete the second and third paragraphs and replace with the following:

> The weight of total moisture, as determined by dry weights, of the base material at the time of weighing in excess of 3 percentage points of optimum moisture content, will be deducted. When mixing is performed in a stationary plant, no direct payment for water will be made. When road mixing is performed, water added to the material during mixing at the direction of the Engineer will be made for payment.

Subsection 312.08 Last sentence, Add the word “exceed”

> “1 layer shall not exceed 8 in. (200 mm).”

Subsection 313.02-Materials, Add the following to the end of this section

Liquid Membrane – Forming Compounds 913.05

Subsection 313.05; section (a) 1. Add to the end of the paragraph

> As an alternative to the steel wheel roller, the cement treated permeable base may be placed with a high-density screed with dual tamping bars.

Subsection 313.05; section (a) 2. Revise the first paragraph to read as follows

Curing; Immediately after spreading and compacting, the cement treated permeable base shall be cured by covering the entire surface and exposed edges with transparent or white polyethylene sheeting in accordance with **Subsection 501.18**, or a white pigmented wax base curing compound meeting the requirements of AASHTO M148. The polyethylene sheeting shall have a thickness of at least 4 mils (100 μm) and shall be held in place for a minimum of 7 days by a method approved by the Engineer. The surface of the cement treated permeable base shall be thoroughly wetted prior to placing the sheeting. The wax based curing compound shall be placed at a rate of 0.04 to 0.05 gallons per square yard (0.18 to 0.23 liter per square meter).

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

March 1, 2006

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(Rev. 12-09-2013)

Supplemental Specifications - Section 400

of the

Standard Specifications for Road and Bridge Construction

March 1, 2006

Subsection 403.02. Revise entire Subsection to the following:

403.02-Bituminous Materials. Bituminous materials shall conform to the requirements of the following Subsections of these Specifications:

Materials	**Subsection**
Emulsified Asphalt, SS-1, SS-1h, CSS-1, CSS-1h, TST-1P, CQS 1h, CQS-1hp, TTT-1, TT1-2	**904.03**
Asphalt Cement, PG 64-22	**904.01**
Chemical Additive	**918.09(B)**

The ranges of application temperatures in degrees F(C) shall be as follows:

SS-1, SS-1h, CSS-1, TST-1P,CQS-1h, and CSS-1h, 60-140° F (15-60° C)
PG 64-22, 70-22, 76-22, or 82-22 with Chemical Additive 375-400° F(190-205° C)
TTT-1, 160-180°F (70-80°C)
TTT-2, 120-160°F (50-70°C)
CQS-1hp, 60-140°F (15-60°C)

mulsified asphalt used as tack will not be allowed. The emulsion shall be applied as delivered from the terminal.

Subsection 403.05. Revise entire Subsection to the following:

403.05-Application of Bituminous Material. Immediately after cleaning the surface, emulsified asphalt shall be applied with the pressure distributor at a rate directed by the Engineer, between 0.05 gal/yd^2 (0.23 L/m^2) and 0.10 gal/yd^2 (0.46 L/m^2) of applied emulsion. If the bituminous material is to be placed upon a milled surface, the rate of application shall be determined by the Engineer between 0.08 gal/yd^2 (0.36 L/m^2) and 0.12 gal/yd^2 (0.54 L/m^2) of applied emulsion.

The surfaces of trees and structures adjacent to the area being treated shall be protected in such a manner as to prevent their being splattered or marred.

The tacked surface shall be allowed to dry until it is in a proper condition to receive the next course. Tack coat shall be applied only so far in advance of the paving operations as is necessary to obtain this proper condition of tackiness. The Contractor shall protect the tack coat from damage until the next course is placed.

Proper application of tack coat shall be achieved through the use of equipment and methods demonstrated on a tack coat test strip. This test strip shall be demonstrated at the same time an initial roller pattern and density test strip is set up for the first layer of asphalt mixture. This test strip application rate shall be between 0.05 and 0.10 gallons of applied emulsion per square yard. If the bituminous material is placed upon a milled surface, the test strip rate of application of tack material shall be between 0.08 and 0.15 gallons of applied emulsion per square yard. In all cases the application will result in a minimum double overlap of the actual track spray as it lands on the surface. The adjustment of the spray-bar and the nozzles may be necessary to achieve this minimum double overlap. Under no circumstances will corn-rows or any other pattern which would result in less than double overlap coverage of the tack coat be acceptable for the tack application. The goal is a very thin but uniform coating of asphalt left on the surface when the emulsion has broken.

Once the test strip has been demonstrated and approved by the Engineer, then this same procedure and application rates shall be applicable for the entire project or until another design is proposed and accepted.

When bituminous material for fog sealing of shoulders is included in the contract it shall be accomplished with emulsified asphalt meeting the requirements of Subsection 403.02. The application rate of diluted emulsified asphalt shall be 0.10-0.15 gal./s.y.(0.45-0.68 liter/m^2) based on a dilution rate of 1 part emulsified asphalt to 1 part water. This application may require 2 equal increments if run-off occurs.

Subsection 403.06. Revise entire Subsection to the following:

403.06-Method of Measurement. Bituminous Material for Tack Coat and Fog Sealing will be measured by the ton(metric ton), as delivered from the terminal, in accordance with the provisions of **Section 109,** Measurement and Payment. Water used for dilution of Asphalt Emulsions will not be measured for payment.

Subsection 403.07. Revise entire Subsection to the following:

403.07-Basis of Payment. The accepted quantities of Tack Coat will be paid for at the contract unit price per ton (metric ton) for Asphalt Emulsion or Asphalt Cement complete in place. The accepted quantities of Fog Seal will be paid for at the contract unit price per ton (metric ton) for Asphalt Emulsion complete in place.

The work required for preparing the designated surface as provided for under **Subsection 403.04** will be measured and paid for in accordance with the provisions of the applicable Section or Subsection under which the work is performed.

Subsection 407.02 Materials, Add the following at the end of this subsection:

When warm mix asphalt additive is used as described in subsection **918.09(B)**, it shall be added by approved blending equipment at the contractor's mixing plant, or it shall be pre-mixed and delivered with the asphalt cement.

Subsection 407.03 (C) Replace the first paragraph with the following:

At least 14 working days prior to the scheduled start of production of any asphaltic paving mixture, the Contractor shall submit in electronic form(e-mail or on a floppy disk) a proposed Job Mix Formula and Laboratory Design, where applicable, prepared in accordance with the Marshall Method of Mix Design (AASHTO R-12), as modified by TDOT, or by Gyratory Compaction (AASHTO T 312, Preparing and Determining the Density of Hot Mix Asphalt (HMA) Specimens by means of the Superpave Gyratory Compactor). Regardless of which method is used, trial blends with at least 4 different asphalt contents (at least 2 above the optimum and 2 below the optimum) shall be made. When the gyratory method of compaction is utilized, the specimens shall be compacted to 65 gyrations with the optimum asphalt content and mixture volumetrics determined at that compaction level. If the specification requirements are not met, it will be necessary to make adjustments to the aggregate types and proportions. In addition the Contractor shall submit an asphalt barge certification with temperature-viscosity curve for each mixture to the Engineer for approval. A sample of each material to be used in the mix shall be delivered to the location designated by the Engineer.

Subsection 407.03 (D) 2 (c) Quality Control System: 8 d **Insert** as the second sentence

"The Contractor, at his risk, may continue to produce and place mixture after the first 500 tons without the test results complete, however all mixture subject to price adjustment or removal at the discretion of the Engineer if the test results do not comply with the specifications."

Subsection 407.03 (D), first paragraph, fourth sentence: **Remove** "on a random basis".

Subsection 407.03 (D) 2 (c) Quality control System, 6, last sentence: **Remove** "on a random basis".

Subsection 407.03 (D), **Table 407-01, Replace** "Required" with "Recommended" in the table heading.

Subsection 407.04a Bituminus Mixing Plant, Add the following to subsection "a" as the 12th bullet:

12. Warm Mix Asphalt process equipment.

Modifications may be made to plants to reduce production and placement temperatures in accordance with subsection 407.21. Plant modifications for warm mix

asphalt production temperatures shall be pre-approved by the department, and shall not detriment the plant's ability to maintain temperature control or mixture proportions.

Modifications made to the plant to reduce mixing temperatures must meet the requirements listed for warm mix asphalt additives in the department's QPL.

Subsection 407.06-Bituminous Pavers: replace second sentence with:

"All paver extensions shall be full assembly extensions, including activated and heated screeds, auger extensions, auger guards, and throw-back blades to place mix beneath the auger gearbox."

Subsection 407.09 Replace subsection in its entirety with the following:

407.09 Weather Limitations. Bituminous plant mix may be placed on properly constructed and accepted sub-grade or previously applied layers provided the following conditions are met:

1. The sub-grade and the surface upon which the bituminous plant mix is placed shall be free of excessive moisture.
2. The bituminous plant mix shall be placed in accordance with the temperature limitations of the following table and only when weather conditions otherwise permit the pavement to be properly placed, compacted and finished.

TEMPERATURE LIMITATIONS

Compacted Thickness	Minimum Air or Surface Temperature	
	Unmodified mixes (PG 64, 67)	Modified mixes (PG 70, 76, 82)
1.5 in. (40 mm) or less	45° F (7° C)	55° F (13° C)
> 1.5 in. (40 mm) to < 3.0 in. (75 mm)	40° F (5° C)	50° F (10° C)
≥ 3.0 in. (75mm)	35° F (2° C)	45° F (7° C)

3. No bituminous plant mix, with a compacted thickness of 1.5 in. (40 mm) or less, shall be placed between November 30 and April 1; and further, no bituminous plant mix, with a compacted thickness greater than 1.5 in. (40 mm), shall be placed between December 15 and March 16.
4. The contractor may request for approval a variance from the above required temperature and seasonal limitations to pave at lower temperatures when there is a benefit to the public. The request shall be in writing, be submitted at least one week prior to the anticipated need, and must include a "Paving and Compaction Plan for Cold Weather" in accordance with the TDOT Procedure. The plan shall identify what practices and precautions the contractor intends to utilize to assure the mixture is placed and compacted to meet the specifications. The plan shall include compaction cooling curves estimating

the time available for compaction, the intended production, haul, and compaction rates with paver and roller speeds estimated. Practices that should be considered include the addition of rollers, reduced production and paving rates, insulated truck beds, and heating the existing surface.

If the Contractor cannot obtain the specified densities, then all paving operations shall cease and a new plan shall be developed. All mixture failing to meet specifications will be subject to price adjustments or removal and replacement at the Contractors expense.

Subsection 407.11 Preparation of Bituminous Material, Replace entire subsection with the following:

407.11-Preparation of Bituminous Material.

A. **Hot Mix Asphalt (HMA).** The bituminous materials for hot mixes shall be heated to the required mixing temperature in accordance with the following **Table B**:

Table B

PG Binder Grade	Minimum Temp.	Maximum Temp.
PG 64-22, PG 67-22	270° F(132° C)	310° F(154° C)
PG 70-22	290° F(143° C)	330° F(166° C)
PG 76-22	290° F(143° C)	330° F(166° C)
PG82-22	290° F(143° C)	330° F(166° C)

The temperature for Grading AS and Grading ACRL mixtures shall be between 225 and 275° F(110 and 135° C), except when modified binders are used, and then the temperatures shall be between 275 and 330°F (135 and 166°C). Aggregate should be coated and no visible drain down should occur in storage silos or hauling equipment."

B. **Warm Mix Asphalt (WMA).** The produced mixture may be subjected to reduced production and placement temperatures by means of either the addition of a chemical warm mix additive in accordance with subsection **918.09(B)** or by use of plant modifications in accordance with subsection **407.04(a).**

When either WMA technology is utilized, the maximum mixing temperature for any grade of asphalt cement shall be no more than 300ºF (135ºC). At the beginning of a day's production, the producer may produce up to five truckloads at temperatures in accordance with Table B in order to pre-heat placement equipment (pavers, transfer devices) prior to producing WMA. The laboratory mixing and compaction temperatures shall be stated on the job mix formula during the mix design approval process. A tolerance of ±5.0ºF (2.8ºC) for each temperature will be allowed.

During test strip construction, the plant-produced WMA must exhibit the ability to meet test requirements for tensile strength ratio (TSR), conditioned tensile strength, Marshall Stability and flow, and boil test listed for HMA in specifications **307, 407,** and **411.**

Subsection 407.15 Revise the entire subsection to the following:

407.15-Compaction. After the bituminous mixture has been spread, struck off, and surface irregularities adjusted, it shall be thoroughly compacted. The method employed must be

approved by the Engineer and be capable of compacting the mixture to the specified density while it is in a workable condition. When no density requirements are specified, a system of compaction for roadway pavements shall be employed which has previously produced required bituminous pavement densities. A control strip and random density samples may be employed to aid the Engineer in evaluating the system.

In general, compaction shall be accomplished by the use of a combination of the equipment designated in **Subsection 407.07**. The following are minimum roller requirements; however, the number of rollers shall be increased if the required results are not being obtained.

Except as noted below, each paving train shall consist of a minimum of 3 rollers as specified in **Section 407.07**. The intermediate roller in each train shall be a pneumatic type. If the surface course contains a latex or polymer additive, a steel wheel type roller for intermediate rolling may be used instead of a pneumatic type provided the surface course meets density requirements.

A minimum of 2 rollers will be required when placing 307 CS mix. Breakdown rolling shall be performed, as soon as possible and while the mixture is sufficiently hot, by a pneumatic tire roller having a minimum contact pressure of 85 psi (585 kPa). A combination roller may not be substituted for a pneumatic roller when placing CS mix. The paver speed shall be regulated so rollers can maintain proper compaction of the mixture as determined by the Engineer.

The minimum number of rollers listed above may, with the approval of the Engineer, be reduced to 1 roller of either the steel-wheel or vibratory type on the following types of construction; (a) On shoulder construction, (b) On incidental construction such as bridge approaches, driveways, etc., and (c) on projects containing less than 10,000 s.y. (9,000 m2) of bituminous pavement.

Unless otherwise directed, rolling shall begin at the low side and proceed longitudinally parallel to the road centerline. When paving in echelon or abutting a previously placed lane, the longitudinal joint shall be rolled first, followed by the regular rolling procedure. When paving in echelon, rollers shall not compact within 6 in. (150 mm) of an edge where an adjacent lane is to be placed. Rollers shall move in a slow uniform speed with the drive wheels nearer the paver and shall be kept as nearly as possible in continuous operation. Rolling shall continue until all roller marks are eliminated. Rollers shall not park on the bituminous pavement.

To prevent adhesion of the mixture to the rollers, the wheels shall be kept properly moistened with water or water mixed with very small quantities of detergent or other approved material. An excess of liquid shall not be used.

Rollers shall not be refueled on the bituminous pavements.

Density Requirements.

ADT 1,000 or less

MIX TYPE	% OF MAXIMUM THEORETICAL DENSITY (AVERAGE)	NO SINGLE TESTS LESS THAN, %
A	90	87
B, BM & BM2	90	87
C & CW	90	87
D	90	87
E	90	87

ADT 1,000 to 3,000

A	91	89
B, BM & BM2	91	89
C & CW	91	89
D	91	89
E	91	89

ADT 3,000 or greater

A	92	90
B, BM & BM2	92	90
C & CW	92	90
D	92	90
E	92	90

Any ADT

Shoulder Mix (B, BM, BM2, D or E)	88	85
A S and A-CRL	None*	None
CS	None*	None

* Density requirements shall be waived on Bituminous Plant Mix Base Grading ACRL, Grading AS and Bituminous Plant Mix Leveling Course, Grading CS; however, a system of compaction for roadway pavements shall be employed which has been approved by the Engineer. When placing Bituminous Plant Mix Base Grading ACRL and Grading AS, the intermediate roller (pneumatic tire) specified previously may be replaced by a steel wheel type if irreparable damage to the pavement is occurring.

The density (bulk specific gravity) determination for a compacted asphalt mixture shall be performed in accordance with AASHTO T-166, Method A only. All core samples shall be COMPLETELY DRY before testing. Air drying is permitted provided core samples are weighed at 2-hour intervals until dry in accordance with AASHTO T166, Section 6.1. Cores may also be dried in accordance with ASTM D7227.

Any base or surface course that tests below the minimum density shall be corrected until the density of the area is equal to or above minimum before it can be used to determine the average density of the lot. No successive layer, where applicable, shall be placed until the area has been corrected. When it is necessary to determine the classification of open graded or dense graded mixes and to measure segregation, ASSHTO T-269 or ASTM D-3203 shall be used.

For density testing purposes, the pavement shall be divided into lots of 10,000 s.y.(9,000 m2), except for 307 Gradings A, B and BM which shall be divided into lots of approximately 5,000 s.y.(4,500 m2). Five density tests shall be performed in each lot and the average results compared with the requirements listed above. At the beginning of the project or at any time it is deemed advisable, smaller lots may be considered in order to evaluate compaction methods or for other reasons which are approved and/or directed by the Engineer.

Acceptance test must be selected randomly and be representative of the lot or sublot. Additional compaction after the acceptance test is acceptable but the original test result must be used to determine lot density. TDOT may take information only samples to spot check compaction. These tests shall not be used as acceptance test.

Along forms, curbs, headers, walls and other places not accessible to the rollers, the mixture shall be compacted thoroughly with hot hand tampers, smoothing irons, or with mechanical tampers. On depressed areas, a trench roller may be used to compact the mix.

Any defective mixture shall be repaired or replaced to the satisfaction of the Engineer.

Test Strips.

Test Strips shall be required for all A, B, BM, C, CW, D, E and F mixes to establish rolling patterns, to calibrate nuclear gauges, to verify that the base course or surface course meets the density requirements of the specifications, and for mix design/ production verification as required.

Construction of the test strip shall be as follows:

1. The base course or other pavement course upon which a test strip is constructed shall have been approved by the Engineer prior to the construction of the test strip.
2. Equipment proposed for use in the compaction of test strips, shall meet the requirements set forth in this subsection and **Subsection 407.07**.

The test strip shall be constructed at the beginning of work on the pavement course. New test strips shall be required when:

1. a change in the job mix formula is necessary
2. a change in the source of materials occurs
3. a change in the material from the same source is observed
4. There is reason to believe that the test strip density is not representative of the bituminous mixture being placed.
5. a change in paving or compaction equipment occurs

With the approval of the Engineer, the Contractor may be permitted to construct additional test strips.

Each test strip shall be constructed with approved bituminous mixture and shall remain in place as a section of the completed work. Each test strip shall be 1 paver width wide and have an

area of at least 400 s.y. (350 m^2) and shall be of the depth specified for the pavement course concerned.

Compaction of the test strip shall commence immediately after placement of the bituminous mixture and be continuous and uniform over the entire test strip.

The compaction of the test strip shall be continued until no appreciable increase in density (1 lb/c.f.. (15 kgs/m^3)) as measured with the nuclear gauge can be obtained by additional roller coverage. The roller coverage necessary to obtain this maximum density shall be used as the rolling pattern for the remainder of the project. Cores shall be taken by the Contractor on the test strip at 10 randomly selected locations. Cores shall not be taken within 2 feet of the longitudinal edges for calibration. These cores shall be given to the State for use in calibrating the nuclear gauge and to verify that the average density of the test strip meets the density requirements of the specifications. All densities will be reported using the corrected nuclear gauge readings.

Correction factors shall be specific to the nuclear gauges utilized during test strip construction. In the event that a different nuclear gauge needs to be utilized for acceptance, new cores will need to be cut from the ongoing pavement construction to calibrate the new gauge.

In the event the density of the asphaltic concrete in the test strip does not meet specification requirements, the Contractor shall make whatever changes are necessary to obtain the specified density. Other sources and combinations of aggregates shall be used as required, subject to approval of the Engineer, to produce a mix meeting the required density.

Subsection 407.16 – Joints, Replace the entire subsection with the following:

407.16-Joints. Placing of the bituminous paving shall be as continuous as possible. Rollers shall not pass over the unprotected end of a freshly laid mixture unless authorized by the Engineer. Transverse joints shall be formed by cutting back on the previous run to expose the full depth of the course. A brush coat of bituminous material shall be used on contact surfaces of longitudinal and transverse joints just before additional mixture is placed against the previously rolled material.

Subsection 407.20 B 1, Remove and replace the Quantity/Sublot Table with the following:

Quantity	**Number of Sublots**
3001-4500 tons	4 tests
2001- 3000 tons	3 tests
501-2000 tons	2 tests
Less than 500 tons	1 test

Subsection 407.20 B 3 (b), Add the following as the first sentence:

Washed gradation of the residual aggregate shall be performed according to AASHTO T-30.

Subsection 407.20, Table 407-2, Revise table to the following:

The percents passing the sieves will be determined in accordance with AASHTO T-30.

TABLE 407-2

ACCEPTANCE SCHEDULE OF PAYMENT (Asphalt Plant Mix Characteristics)			
		Average Arithmetic Deviation of the Lot Acceptance Test from the Job Mix Formula	
Characteristics	**Pay Factor**		
		1 Test	2 Tests or more
Asphalt Cement	1.00	0.00-0.30	0.00-0.25
Content ***	0.95	0.31-0.35	0.26-0.30
(Extraction or	0.90	0.36-0.40	0.31-0.35
ignition oven)	0.80*	over 0.40	over 0.35
Gradation			
3/8 In.	1.00	0.00-6.50	0.00-5.70
(9.5 mm),	0.95	6.51-7.08	5.71-6.20
Sieve and	0.90	7.09-7.66	6.21-6.69
Larger	0.80*	over 7.66	over 6.69
Gradation			
No. 4 Sieve**	1.00	0.00-4.62	0.00-4.00
(4.75 mm)	0.95	4.63-5.20	4.01-4.50
	0.90	5.21-5.77	4.51-5.00
	0.80*	over 5.77	over 5.00
Gradation			
No. 8 16, 30 & 50	1.00	0.00-3.80	0.00-3.30
(2.36 mm, 600 µm	0.95	3.81-4.46	3.31-3.91
& 300 µm ,) Svs**	0.90	4.47-5.12	3.92-4.52
	0.80*	over 5.12	over 4.52
Gradation			
No. 100 & 200	1.00	0.00-1.80	0.00-1.60
(150 µm & 75 µm)	0.95	1.81-2.00	1.61-1.75
Sieves**	0.90	2.01-2.20	1.76-1.90
	0.80*	over 2.20	over 1.90

*If approved by the Engineer, the Contractor may accept the indicated partial pay. The Department may require removal and replacement at no cost. The Contractor has the option to remove and replace at no cost to the Department at any time.

Subsection 411.03 Composition of Mixtures, Replace entire subsection with the following:

411.03-Composition of Mixtures.

(a) General Composition of mixtures used in this construction shall meet all applicable requirements of Subsection 407.03.

(b) The specified mineral aggregate and asphalt cement shall be combined in such proportions as to produce mixtures within the following master composition limits.

Proportions of Total Mixture, Per Cent by Weight

Surface Courses	Effective Combined **Mineral Aggregate**	**Asphalt Cement**
Grading D	93.0- 94.3	5.7-7.0*
Grading E**	93.0- 94.3	5.7-7.0*
Grading E (shoulders)	92.0-94.7	6.0-6.5*

*If the effective combined specific gravity of the aggregate exceeds 2.80, the above proportions may be adjusted as directed by the Engineer. The upper limit for Flow values shall not apply to mixes with modified asphalt liquids.

**The minimum allowable asphalt cement content for 411-e low volume mixtures shall be 5.3%.

Grading D

In addition to the other requirements of these specifications the composition of the mineral aggregate shall be such that when combined with the required amount of bitumen the resultant mixture shall have:

All Roads

Mix	**Stabil. Min. lbft* (kN)**	**Flow 0.01 in. (mm) *****	**Design Void content%***	**Production Void Content %***	**Min. VMA%***	**Dust-Asphalt Ratio****
411D	2,000 (9.0)	8-16 (2-4)	4.0±0.2	3-5.5	14	0.6-1.2

*Tested in accordance with AASHTO T 245 with 75 blows of the hammer on each side of the test specimen, using a Marshall Mechanical Compactor.

**The dust to asphalt ratio is the percent of the total aggregate sample that passes the 200 mesh(75 µm) sieve as determined by AASHTO T 11 divided by the percent asphalt in the total mix

***Flow will only be required when using a non-modified binder (PG 64-22 or 67-22)

****In order to identify critical mixes and make appropriate adjustments, the mix design shall have these required production properties for the bitumen content range of Optimum Asphalt Cement ±0.25%.

When limestone screenings or agricultural limestone are utilized, the maximum amount by weight of the mineral aggregate shall be 25% unless the material is shown to meet the same coarse surface aggregate requirements for limestone as listed in

Subsection 903.11 (c) Grade D (Types I, II, III, IV). In no case shall the combined aggregate blend consist of less than 75% non-skid material. When natural sand is used as fine aggregate, it shall be limited to a maximum amount of 25% by weight of the mineral aggregate. A maximum of 5% mineral filler meeting the requirements of **Subsection 903.16** may be substituted for an equal quantity of the limestone fines. If the mixture does not comply with the design criteria, another source of aggregate shall be required.

When gravel is used as the coarse aggregate for a 411 Grading D mix, a minimum of 20% by weight limestone screenings, agricultural limestone and/or mineral filler shall be required.

Grading E

In addition to the other requirements of these specifications where Grading E is used for the riding surface the composition of the mineral aggregate shall be such that when combined with the required amount of bitumen the resultant mixture shall have:

High Volume Roads (ADT over 1,000)

Mix	Stability Min. lbft* (kN)	Flow 0.01in. (mm)**	Design Void content %*	Production Void Content %*	Min. % VMA*
411 E	2,000 (9.0)	8-16 (2-4)	4.0±0.2	3-5.5	14

Low Volume Roads (ADT 1,000 and below)

Mix	Stability Min. lbft* (kN)	Flow 0.01in. (mm)**	Design Void content %*	Production Void Content %*
411 E	1,500 (6.75)	8-16 (2-4)	3.5±0.5	2-5

*Tested in accordance with AASHTO T 245 with 75 blows of the hammer on each side of the test specimen, using a Marshall Mechanical Compactor.

**Flow will only be required when using a non-modified binder (PG 64-22 or 67-22)

*** Minimum stability for shoulder mixes will be 1500 lb.ft. (kN) and optimum Asphalt Cement content for shoulder mixes shall be as directed by the Regional Materials Supervisor.

If the design criteria above cannot be obtained with the aggregate, submitted to the laboratory for design, another source of aggregate will be necessary.

(c) Recycled Asphalt Pavement and Recycled Asphalt Shingles

Recycled Asphalt Pavement (RAP)

The Contractor may utilize asphalt pavement that has been removed from a Department project or other State Highway Agency project by an approved method and stored in a TDOT approved stockpile. Recycled Asphalt Pavement (RAP) combined with the appropriate aggregate, asphalt cement, and anti-strip additive when required shall produce a mixture that will otherwise meet all the requirements of **Subsection 903.11** and the requirements herein **Section 411**. RAP shall be allowed in each mix listed in the following table:

Mix Type	%RAP (Non-processed)	Maximum %RAP (Processed)	Maximum % RAP Processed and Fractionated	Maximum Particle size
411D(PG64-22, PG67-22)	0	15	20	½ in. (12.5 mm)
411D(PG70-22)	0	10	15	½ in. (12.5 mm)
411D(PG76-22, PG82-22)	0	10	15	½ in. (12.5 mm)
411E(Roadway)	0	15	20	½ in. (12.5 mm)
411E(Shoulder)	15	30	35	½ in. (12.5 mm)

RAP that has been crushed and screened or otherwise sized such that the maximum recycled material particle size is less than that listed in the table above prior to entering the dryer drum, shall qualify as "Processed". "Non processed" RAP shall be similar material that has not been crushed and screened or otherwise sized previous to its use. When RAP is processed over more than one screen, producing sources of various maximum particle size (i.e. – ¾" to ½", ½" to #4, etc.), it will be referred to as "fractionated", and larger percentages will be allowed as noted above. These increased percentages will only be allowed provided the individual fractions are introduced into the plant as separate material sources for increased control.

All mixes shall contain at least 80% virgin asphalt except for 411E Shoulder Mix which shall have at least 65% virgin asphalt.

The Contractor shall obtain a representative sample from the recycled material stockpile and establish a gradation and asphalt cement content as required. The Contractor shall determine the gradation and asphalt content of the recycled material at the beginning of a project and every 2,000 tons (2,000 metric tons) thereafter. The stockpile asphalt cement content for all recycled material shall not vary from the Job Mix Formula by more than ± 0.8 %. The stockpile gradation tolerance for all recycled material on each sieve is listed below.

3/8in. (9.50 mm) sieve and larger .....± 10%
No. 4(4.75 mm) sieve.....± 8%
No. 8(2.36 mm) sieve.....± 6%
No. 30(600 µm) sieve.....± 5%
No. 200(75 µm) sieve.....± 4%

The Contractor will be responsible for his own sampling and testing of the RAP as well as new materials for bid purposes, and for the submission of the job mix formula in accordance with **Subsection 407.03**. After mixing, the moisture content of the total mix shall be no more than 0.1% as determined by oven drying, and the provisions for lowering the temperature because of boiling or foaming shall not apply.

The mixture will be accepted for aggregate gradation and asphalt content based on extractions or in accordance with AASHTO T 308.

Recycled Asphalt Shingles (RAS)

Recycled Asphalt Shingles (RAS) may be included to a maximum of 5 percent of the total weight of mixture. The percentage of RAS used will be considered part of the maximum allowable RAP percentage. The ratio of added new asphalt binder to total asphalt binder shall be 65% or greater for all 411 mixes. Either the mix producer or the RAS supplier shall obtain a representative sample from the recycled material stockpile and establish a gradation and asphalt cement content as required. Shingle asphalt binder content shall be determined by AASHTO T-164 Method A, with a minimum sample size of 500 grams. The Contractor shall determine the gradation and asphalt content of the recycled material at the beginning of a project and every 2,000 tons (2,000 metric tons) of recycled material used thereafter. The stockpile asphalt cement content for all recycled material shall not vary by more than 0.8%. All RAS material shall be processed to a minimum 100 percent passing the 3/8 inch (9.5-mm) sieve and a minimum 90 percent passing the #4 (4.75-mm) sieve.

To conduct the gradation testing, a 500-700 gram sample of processed shingle material is air dried and dry sieved over the 3/8" and #4 sieves and weighed. For Mix Design purposes, the following aggregate gradation may be used as a standard gradation in lieu of determining the shingle gradation by AASHTO T30.

Sieve Size	% Passing
3/8 inch (9.5 mm)	100
#4 (4.75 mm)	97
#8 (2.36 mm)	95
#16 (1.16 mm)	80
#30 (0.60 mm)	60
#50 (0.30 mm)	50
#100 (0.150 mm)	40
#200 (0.075 mm)	30

An aggregate bulk specific gravity (G_{sb}) of 2.650 may be used in lieu of determining the shingle aggregate G_{sb} (AASHTO T84). In addition, the effective binder available for mixing with additional aggregates shall be considered as 75 % of the total binder content as determined by AASHTO T-164 described above and shall be the value listed as the RAS binder content on the Job Mix Formula.

Scrap asphalt shingle shall not contain extraneous waste materials. Extraneous materials including, but not limited to, asbestos, metals, glass, rubber, nails, soil, brick, tars, paper, wood, and plastics shall not exceed 0.5 percent by weight as determined on material retained on the 4.75-mm (No. 4) sieve. To conduct deleterious material testing, a representative 500-700 gram sample of processed shingle material shall be sieved on the #4 sieve and any extraneous waste material retained on the #4 sieve is picked and weighed. The percent extraneous is based on the total sample weight.

RAS shall contain less than the maximum percentage of asbestos fibers based on testing procedures established by TDOT, state or federal environmental regulatory agencies. A minimum of one (1) sample of processed asphalt roofing material for every five hundred (500) tons of material processed shall be analyzed for the presence of asbestos containing material.

Before a Job Mix Formula for a particular design is approved, the following shall be submitted, along with materials and paperwork required by TDOT Specification 407.03:

- Certification by the processor of the shingle scrap describing the shingle scrap content and source.
- A 1000g sample of the processed RAS material for inspection (new designs only)

RAS shall be stockpiled separate from other salvage material. Blending of RAS material in a stockpile with other salvage material is prohibited. Blending of Manufacture Waste Scrap Shingles (MWSS) and TOSS shall not be allowed. In addition, blending of a virgin sand material with the processed shingles, to minimize agglomeration of the shingle material, shall not be allowed.

All RAS supplied to a TDOT project must come from a certified shingle processor/supplier approved by TDOT Headquarters Materials and Tests.

(d) Anti-Strip Additive

Asphaltic concrete surface mixtures (Grading D & E) shall be checked for stripping by the Ten Minute Boil test for dosage rate and ASTM D 4867(Root-Tunnecliff procedure) for moisture susceptibility.

If moisture susceptibility is indicated, then an approved anti-strip agent shall be mixed with the asphalt cement at the dosage recommended by the respective test and as specified in **Subsection 918.09(B).**

Subsection 411.09-Method of Measurement. Remove and replace the entire subsection with the following:

Subsection 411.09-Method of Measurement. Mineral Aggregate including Mineral Filler, when required, and Asphalt Cement for Asphaltic Concrete Surface (Hot Mix) will be measured as prescribed in Subsection 407.19. Mineral Filler when required will not be measured for payment separately, but will be included as mineral aggregate.

If recycled mix is permitted, the completed mix, including new mineral aggregate, planings, asphalt cement and additive, shall be measured by the ton (tonne) in accordance with Section 109. For bidding purposes, the asphalt cement content of the specified mix shall be used in the chart below:

Mix Type	Asphalt Content
411-D	5.9%
411-E Roadway	6.3%
411-E Shoulder	6.3%

In the event that the Engineer sets an asphalt content other than that stated above, a price adjustment will be made based on the asphalt content set by the Engineer and the Monthly Bituminous Index for the specific grade asphalt cement on the mix design. The price adjustment will be calculated according to the following formula:

PA = [MBI x (DA-BA) x T]/100

Where:

PA = Price Adjustment

MBI = Monthly Bituminous Index

DA = Percent asphalt set on the mix design

BA = Percent asphalt specified above to be used for bidding

T = Total tons (metric tons) asphalt mix for price adjustment

The liquid anti-strip additive will be measured by the gallon(liter) and paid as outlined in Subsection 411.10. Hydrated Lime will be measured by the ton(metric ton) and paid as outlined in Subsection 411.10.

No direct payment will be made for polymer or latex additives and cost thereof shall be included in the price bid for the modified asphalt cement or modified mixture.

Subsection 414.03, Revise entire section as follows:

414.03-Composition of Mixture. At least 2 weeks prior to beginning work the Contractor shall submit a signed original of a mix design covering the specific materials to be used on the project to the Materials and Tests Division for acceptance together with representative samples of each ingredient to be used in the mixture. The samples should contain information relative to sources, type of materials and project number.

This design must have been performed by a qualified laboratory. Once the materials are approved, no substitution will be permitted unless first tested and approved by the laboratory preparing the mix design. No work shall begin nor will any mixture be accepted until the Materials and Tests Division has evaluated and accepted the mix design.

The laboratory report will show the results of tests performed on individual materials, comparing their values to those required by this specification. Job aggregates will be used in all laboratory design tests. Mixing tests must pass at the maximum expected air temperature in ISSA T113.

Slurry Seal . The laboratory report will provide the following information on the slurry seal mixture.

Quick-Set Emulsified Asphalt Slurry Seal

Mixing Time Test, seconds @ 77° F(25° C) (TB #113),	120 minimum

Mix Time @ (50° and 100° F) (10° and 37.7° C)	(informational)
Set Time Tests	
30-Minutes-Blotter Test (TB #102)	no brown stain
Displacement Test	no displacement
Water Resistance Test @ 30 minutes (TB #102)	no discoloration
Wet Stripping Test, % coating (TB #114)	90% minimum
System Compatibility (TB #115)	Pass
Set Time Tests: 30 minutes (TB #139)	12 kg-cm minimum
Early Rolling Traffic Time: 2 hours (TB #139)	20 kg-cm minimum
Wet Track Abrasion Test, loss in g/ft2 (g/m2) (TB #100)	75(800) maximum 6 day soak

In addition to the tests specified above, the following test will be required on roadways having greater than 1500 ADT.

ISSA T #109	Test Method for Measurement of Excess Asphalt in Bituminous Mixtures by Use of a Loaded Wheel Tester and Sand Adhesion
1,500-3,000 ADT	Maximum 55grams/psf (590g/m^2) sand adhesion, 1,000 cycles @ 125 lbs. (57 kgs).
3,000+ ADT	Maximum 50grams/psf (540g/m^2) sand adhesion, 1,000 cycles @ 125 lbs.(57 kgs).

Slurry Seal Composition. Emulsified asphalt slurry seal shall be a uniform mixture of aggregate, emulsified asphalt, latex solids when specified on the Plans, mineral filler and water. Compatibility of all ingredients (including the mix set additive) of the mix shall be certified by the emulsified asphalt manufacturer.

The percent of residual asphalt based on the weight of the dry aggregate shall be between 7.5 and 13.5 with a mixture control tolerance of ±0. 50%.

The aggregate gradation and percent residual asphalt, as provided in the slurry seal design accepted by the Engineer, shall be maintained within the mixture control tolerances stated herein.

Portland cement may be added to obtain the desired dispersion and working characteristics of the slurry. Such addition shall be stated on the slurry seal design, shall not exceed 3% of the weight of the aggregate, and shall have a mixture control tolerance of ±0.25%.

Portland cement added for dispersion of the slurry seal shall be a commercial quality, non-air entraining cement and shall not be considered as mineral filler for the purpose of satisfying the gradation requirements of the aggregate.

The aggregate shall be prewetted with a minimum amount of water prior to blending with the emulsified asphalt to obtain a fluid, homogeneous slurry mixture of the proper consistency. No additional water above that quantity required by the slurry seal mix design shall be added to the slurry mix in order to obtain a more workable mixture.

Micro Surfacing. The laboratory report will provide the following information on the micro-surface mixture.

Mixing Time Test, secs @ 77° F (25° C), (T-102)	120 minimum
Mix Time @ 50 and 100° F (10° C and 37.7° C)	(informational)
Set Time Tests: 30 minutes (T-139)	12 kg-cm minimum
Early Rolling Traffic Time: 60 minutes (T-139)	20 kg-cm minimum
Wet Stripping Test, % coating (T-114)	90% minimum
Wet Track Abrasion Test, loss in g/ft^2 (g/m^2) (T-100)	75 (800) max 6 days 50 (538) max. 1 hour
Measurement of Excess Asphalt (T-109)	Max. 50 grams/ft^2 (540 grams/m^2) Sand Adhesion, 1,000 Cycles @ 125 lbs. (57 kgs).
Classification Compatibility (T-144)	11 pt. minimum
Loss on Ignition (LOI) Test, TDOT Spec. 40703 E	(informational)

Micro-Surface Composition. For the paving mixture, the design shall verify the functioning of the set regulating additives and shall present certified test results for the Engineer's approval. Aggregate in the mixture shall represent material to be used on the project.

The Engineer shall approve the design prior to use. Proportions for the design shall be within the following limits:

Modified Emulsified Asphalt Residue by Dry Wt. of Aggregates	5.0-9.0%

Mineral Additive by Dry Weight of Aggregate	0.5%-3.0%
Latex or Polymer Based Modifier provide the specified properties	3% minimum and as required to
Mix Set Additive	As required to provide the specified properties
Water	As required to produce consistency

Portland cement may be added to obtain the desired dispersion and working characteristics of the mix. Such addition shall be stated on the micro-surface design, shall not exceed 3% of the weight of the aggregate, and shall have a mixture control tolerance of ±0.25%.

Portland cement added for dispersion shall be a commercial quality, non-air entraining cement and shall not be considered as mineral filler for the purpose of satisfying the gradation requirements of the aggregate.

The mixture shall also be proportioned such that the test strip requirements in **Subsection 414.06** are achieved.

Applicable Specifications. The following specifications and test methods form a part of this specification.

Title	Source
Mixing, Setting and Water Resistance Test to Identify "Quick-Set" Emulsified Asphalts	ISSA TB-102
Wet Track Abrasion of Micro Seals	ISSA TB-100
Measurement of Micro-Seal Consistency	ISSA TB-106
Test Method for Measurement of Excess Asphalt in Bituminous Mixtures by Use of a Loaded Wheel Tester	ISSA TB-109
Outline Guide Design Procedure for Slurry -Seal	ISSA TB-111
Method to Estimate Micro-Seal Spread Rates and to Measure Pavement Macrotexture	ISSA TB-112
Trial Mix Procedure for Slurry -Seal Design	ISSA TB-113
Wet Stripping Test for Cured Slurry-Seal Mixes	ISSA TB-114
Test Method to Classify Emulsified Asphalt/Aggregate Mixture Systems by Modified Cohesion Tester. Measurement of Set and Cure Characteristics	ISSA TB-139
Classification Compatibility	ISSA TB-144
Design, Testing and Construction of Micro-Seal	ASTM D 3910
Quantitative Extraction of Bitumen for Bituminous Paving Mixtures	ASTM D 2172

The blended asphalt mixture, when combined with aggregate and mineral filler, shall have the following characteristics:

1. Be capable of filling up to ½ in. (13 mm) wheel ruts in one pass.
2. Be capable of field regulation of the setting time.
3. Be suitable for nighttime placement.

Subsection 414.04, Revise subsection as follows:

414.04-Equipment. All equipment necessary for the satisfactory performance of this work shall be on hand and approved before the work is permitted to begin. All equipment, tools, and machines used in the performance of this work shall be maintained in satisfactory working condition. The Contractor shall have available at all times a device capable of determining aggregate moisture within 3 minutes.

All trucks shall be covered immediately after loading with a cover of canvas or other suitable material. The cover shall lap down along the sides and rear of the truck bed a minimum of 6 in. (150 mm) and be secured by tie downs at a maximum of 5 ft. (1.5 m) spacing along the sides and rear of the truck bed. All trucks must be equipped to meet the above requirements prior to commencing hauling operations.

Power brooms, power blowers, air compressors, water flushing equipment and hand brooms shall be capable of thoroughly cleaning all cracks and the old surface. Hand squeegees, hand brooms, shovels and other incidental equipment shall be provided as necessary to perform work.

Mixing Equipment. The mixing equipment shall be re-supplied with all materials while depositing the mixture on the roadway in order provide a continuous, non-stop surfacing operation. The paving mixture shall be produced in a self-propelled, front feed, continuous loading, mixing machine equipped with a positive, non-slipping aggregate delivery system and an interconnected, positive displacement water-jacketed gear pump to accurately proportion ingredients.

The mixing machine shall be equipped with an approved fines feeder that has an accurate metering device or method to introduce a predetermined amount of mineral filler into the mixer at the same time and location as the mineral aggregate. A spray bar shall be provided to completely wet the aggregate dropping down to the pug mill with additive and water. The twin-shafted multi-blade pug mill shall be a continuous flow type and a minimum of 50 in. (1.25 m) long. The emulsion shall be introduced above the third point of the mixer to ensure proper premixing of the aggregate, cement, additive and water when the modified emulsified asphalt is added. Blade size and side clearances shall meet the equipment manufacturer's recommendations.

Mixing shall be done in a manner that does not cause premature breaking of the emulsified asphalt. The mixing unit of the mixing chamber shall be capable of thoroughly blending all ingredients.

The mixer shall be equipped with a remote forward speed control at the back mixing platform so the back operator can control forward speed and level of mixture in paving or rut box. Effective April 1, 2006, the Contractor shall provide a computerized material monitoring system with integrated material control devices that are readily accessible and positioned so the amount of each material used can be determined at any time. The mixer shall be equipped with a back-up electronic materials counter that is capable of recording running count totals for each material being monitored. The mixer shall be equipped with a radar ground measuring device.

Each material control device shall be calibrated prior to each mix application and as often thereafter as deemed necessary by the Engineer. The computer system shall have the capability to record, display and print the following information:

- Individual sensor counts for emulsion, aggregate, cement, water and additive
- Aggregate, emulsion, and cement output in lbs.(kgs) per minute
- Ground travel distance. The mixer shall be equipped with a Radar Ground metering device
- Spread rate in lbs./s.y.(kgs/m^2)
- Percentages of emulsion, cement, water and additive
- Cumulative totals of aggregate, emulsion, cement, water and additive
- Scale factor for all materials

The computer system shall be functional at the beginning of work, and must be functional during each calibration.

The mixing machine shall be equipped with a water pressure system and fog type spray bar, adequate for complete fogging of the surface preceding spreading equipment of the mixture.

The mixing machine shall include controls for proportioning and calibrating the aggregate feed. The aggregate feed device shall be equipped with a revolution counter so that the amount of aggregate used may be determined at any time and shall have a positive locking feed gate.

The emulsion pump shall be of the positive displacement type and shall be equipped with a device so that the amount of emulsion used may be determined at any time. The emulsion pump, meter and piping shall be arranged to afford a means to calibrate the meter by weighing a metered volume. The pump shall deliver the emulsion to the mixer box at a uniform rate which shall not vary more than 2% from the required quantity.

The water pump shall be equipped with a minimum of 2 valves. One valve shall establish the required water flow. The other valve shall be a quick acting valve to start and stop the water flow.

The mixing machine shall have sight gauges located at the material storage tanks for the asphalt emulsion and water.

The mixing machine shall be equipped with approved metering devices so that it can be accurately calibrated and the quantities of materials used during any 1 period can be closely estimated. In the event that the metering devices stop working properly, the mixing machine shall no longer be used until necessary repairs have been made.

Satisfactory means shall be provided to afford positive interlocking control between the flow of aggregate from the bins and the flow of emulsion from the pump. Each mixing unit shall be calibrated in the presence of the Engineer prior to construction. The documentation shall include an individual calibration of each material at various settings, which can be related to the machine's metering devices. When calibrating the emulsion system, a minimum of 3 tests shall be run, with each test run being a minimum of 40 gal. (150 liters). Calibration of the aggregate delivery system shall require tests at 3 different gate settings with 2 test runs at each gate setting and a minimum of 425 lbs. (193 kgs) per test run. Calibration of the filler(cement) delivery system shall require 3 tests at a minimum of 25 lbs. (11 kgs) per test. The scales used shall be certified. No machine will be allowed to work on the project until the calibration has been completed and accepted. Additional calibrations may be required during the process of the work as directed by the Engineer.

Spreading Equipment. Attached to the machine shall be hydraulically adjustable(adjustable while applying mixture) type spreader box with a positive screed adjustment for yield control and a positive adjustment for the joint matcher. The box shall be attached to the mixer, equipped with ribbon flights mounted on an adjustable shaft to continually agitate and distribute the materials throughout the box. The box shall be equipped with curb bumpers and replaceable runners with a minimum of 5 ft. (1.5 m) long end runners. The box shall be equipped with a sufficient walkway to provide access to either side of the spreader box without walking through the freshly laid material. The spreader box shall be heavy duty with crossbracing for rigidity and a manufacturer's weight not less than 1,400 lbs. (635 kgs) at a width of 12 ft. (3.6 m). The box must be capable of laying mix to a width of 14 ft. (4.3 m). The equipment shall provide sufficient turbulence to prevent the mix from setting in the box or causing excessive side build-up or lumps. To prevent the loss of the mixture from the box, the Contractor shall attach flexible seals, front and rear, in contact with the road. The full width application box shall be equipped with a secondary strike-off located approximately 2 to 3 ft. (0.5 to 1.0 m) behind the primary strike-off to minimize transverse corrugations. The secondary strike-off shall have elevation and width adjustments similar to the primary strike-off. It shall have a pivot point where it can be tilted for texturing or raised completely off the surface. Rut filling shall require a steel or high density strike-off on the spreading equipment (as approved by the engineer) or the use of a rut box. A rut box shall be used for filling ruts in excess of 3/8 in. (10 mm) unless otherwise specified on the plans. The Contractor shall operate the spreading equipment in such a manner to prevent the loss of the mixture on super-elevated curves. Mixture shall be spread to fill cracks and minor surface irregularities and achieve a uniform skid-resistant surface without causing skips, lumps or tears in the finished mat.

For slurry seals, the use of burlap drags or other drags necessary to obtain the desired finish, shall require approval by the Engineer. Drags having excessive build-up shall be replaced. Drags shall be kept in a completely flexible condition at all times. No drags shall be used on Micro-surfacing.

Subsection 414.06, Revise subsection as follows:

414.06-Application. Prior to the placement of the mixture, a tack coat of SS-1h, CQS-1h or CQS-1hp emulsion shall be applied with an asphalt distributor. The tack coat shall consist of 1 part emulsion and 3 parts water. The application rate shall be 0.10 to 0.15 gal./s.y.(0.5 to 0.7 L/m^2) of the diluted emulsion. The actual application rate shall be determined by the Engineer. The method of application of the tack coat shall be in accordance with **Section 403**.

The emulsified asphalt slurry seal shall be applied at a rate of 16 ±2 lbs./s.y.(of 8.75 ±1 kgs/m^2) based on dry aggregate weight unless otherwise specified on the Plans. The rate of application shall be varied within the range specified above as required by the condition of the pavement to obtain a minimum thickness of 1/8 in. (3 mm) above the high points of the milled areas and ¼ in. (6 mm) thickness on unmilled areas.

Micro-surface shall be applied as follows:

- Rutfill Course. If a rut fill course is specified, apply enough material to fill the wheel paths without excess crowning (overfilling). An excess crown is defined as 1/8 in. (3 mm) after 24 hours of traffic compaction. Apply rut fill courses in widths from 5 to 6

ft. (1.5 to 1.8 m) for each wheel path. Provide a smooth, neat seam where 2 rut fill passes meet. Take care to restore the designed profile of the pavement cross-section. Feather the edges of the rut fill course to minimize the use of excess material.

- Leveling Course. If a leveling course is specified, apply at a rate of 14 ±2 lbs /s.y. (7.6 ±1.1 kgs/m^2) based on dry aggregate.
- Surface Course. If a surface course is specified and it is placed over a leveling course, apply at a rate of 18 ±1 lbs/s.y. (8.7 ±0.6 kgs/m^2) based on dry aggregate. If a surface course is specified and it is not placed upon another micro-surfacing course, apply the paving mixture at a minimum rate of 22 lbs/s.y. (11.9 kgs/m^2) based on dry aggregate.

Micro-surface shall be applied at the rates as specified on the plans for leveling and surface courses.

The mixture shall be applied based on dry aggregate weight as specified on the plans.

The maximum allowable speed of the machine shall be 130 ft. (40 m) per minute. When rut filling, the maximum allowable speed shall be determined by the Engineer. The final surface seal shall be placed uniformly across the width of the traffic lane unless otherwise specified or directed. The action of the squeegee shall permit the mix to flow freely leaving a smooth, uniformly textured surface.

Unless otherwise directed by the Engineer, the surface shall be pre-wetted with water by fogging ahead of the spreader box. Pre-wetting shall be closely controlled to prevent accumulation of water to the point of running off or puddling.

As the aggregate and emulsion are being loaded into the aggregate/emulsion support trucks or mixing machine, the aggregate shall be given a final screening by sieving it through screening equipment capable of removing any random oversize material.

The mixture shall be of the desired consistency when deposited on the surface after which no additional elements shall be added. A sufficient amount of mixture will be carried in all parts of the spreader at all times so the complete coverage is obtained. No lumping, balling or unmixed aggregate shall be permitted. No segregation of the emulsion and aggregate fines from the coarse aggregate will be permitted. If the coarse aggregate settles to the bottom of the mix, the mix will be removed from the pavement. The mixture shall have proper consistency so that excessive splattering and excessive free water is avoided. The spraying of water into the spreader box during lay down operations will not be permitted. Hand tools, lutes and squeegees shall be used to spread mix on areas not accessible to the machine spreading equipment. Rolling with a pneumatic-tired roller shall be required after proper curing for sections of pavement not to be exposed to traffic. The roller shall be equipped with tires with a pressure of 40-60 psi(275 to 425 kPa).

Quality Control: The Contractor shall produce a mixture that will be in compliance with the mix design and the quality control tolerances. The Slurry Seal or Micro-Surface shall be applied at the rates as specified on the plans. The methods described in this section shall be used by the Contractor to measure compliance. Contractor shall maintain all quality control documentation and make available to the Engineer or Project Inspector upon request or at completion of work.

a. Asphalt Content – The Contractor shall calculate the % asphalt content of the mixture from the equipment computer display readings randomly, a minimum of 3 times a day. The quality control tolerances from the mix design is ± 0.5%.

b. Application Rate – The Contractor shall calculate the yield of the course being placed from the equipment computer display readings randomly, a minimum of 3 times a day. The quality control tolerance from the specified application rate is ±2 lbs/s.y. (±1 kg/m^2).

c. Documentation – The Contractor shall maintain a daily report and a lot sheet as follows:

1. Daily Report – The daily report shall include the following information:
   - Aggregate used, ton(metric ton) (dry)
   - Slurry or Micro-Surfacing emulsion used, ton(metric ton)
   - Bituminous Materials for Tack Coat and for Fog Seal, ton (metric ton)
   - Cement used, ton(metric ton)
   - Water used in mixture, gallons(liters)
   - Additive used in mixture, gallons(liters)

d. Test Strip Construction - Prior to production application, the Contractor shall place a 1,000 ±50 ft. (300 ±15 m) test section to verify a quick traffic system is being used. The test strip shall be placed at the same time as paving is to take place, night or day, and under the same ambient conditions. The test strip shall be able to carry normal traffic within 60 minutes. If normal traffic cannot be carried, the emulsion or mixture must be adjusted and another test strip will be required.

Lot Sheet - The project shall be segmented into lots with any 1 lot not to exceed 20,000 s.y.(16,700 m^2). For each lot the Contractor shall maintain a lot sheet, providing the following information:

- Control Section, Job Number, Route, Engineer (Project Inspector)
- Date, Air Temperature
- Control Settings, Calibration Values, Unit Weight of Emulsion (lbs per gallon) (kgs per liter), Percent residue in Emulsion.
- Beginning and Ending Intervals
- Computer display readings for material usage (Beginning, and Ending, and Total)
- Length, Width, Total Area (s.y.) (m^2), (lbs.) (kg) of Aggregate, lbs. (kg) of Emulsion, lbs. (kg) of Cement.
- Percent of each Material, Percent of Asphalt Cement, Application Rate, Combined Application Rate (lbs./yd^2) (kgs/m^2)
- Mix Design (Percent Portland Cement, Percent Emulsion, Percent Asphalt Cement)
- Contractors Authorized Signature
- Calibration Forms

Subsection 414.08. Revise entire subsection to the following:

414.08-Fog Seal Application. Fog sealing of shoulders shall meet the requirements of Subsection 403.05.

Subsection 414.09, Revise subsection as follows:

414.09-Weather Limitations. Micro-surface and slurry seal shall be placed only when the pavement surface temperature and the ambient air temperature are a minimum 50° F(10° C) and rising. These applications will not be placed during foggy or rainy conditions. Placement shall be limited to the period from April 1 to October 31.

Subsection 414.11, Revise the first and second paragraphs to as follows:

414.11 Method of Measurement

The Department will measure:

1. Emulsified Asphalt Slurry Seal by the square yards complete in place and accepted.
2. Micro-Surfacing by the square yards complete in place and accepted or
3. The quantity of aggregate for Micro-Surfacing, including mineral filler, by the ton (dry), based on the calibrated metering devices affixed to the micro-surface mixing machine and
4. The quantity of latex or polymer modified emulsion used in the accepted portion of the micro-surfacing by the ton of material, based on the calibrated metering device affixed to the micro-surface mixing machine or
5. Bituminous Materials for Tack Coat and for Fog Seal by the ton of undiluted emulsion.

The quantity for "Bituminous Material for Tack Coat", Item No. 403.01, should be 1/4 of the estimated application rate. The Department will not directly pay for latex or polymer additives when used and will consider their cost to be included in the price bid for the respective items.

For bidding purposes, assume the emulsified asphalt content for the slurry mix design is 15%. When micro-surfacing is bid by the square yard, the design asphalt content is 12%. If the Engineer sets an emulsified asphalt content for slurry seal other than that stated above, the Department will make a price adjustment based on the emulsified asphalt content set by the Engineer and the invoice price of the emulsified asphalt F.O.B. the project delivery point. The Department will calculate the price adjustment according to the following formula:

$$PA = \frac{[IP \times (DA - BA) \times T]}{100}$$

Where:

PA =	Price Adjustment
IP =	Invoice price of emulsified asphalt cement
DA =	Percent emulsified asphalt set on the mix design
BA =	Percent emulsified asphalt specified above to be used for bidding
T =	Total tons of aggregate for price adjustment as determined by the metering system on the mixing machine

The Department will make payment to the Contractor for additional emulsified asphalt as provided for above at the purchase price F.O.B. the project delivery point, as verified by invoice, with no compensation allowed for further handling or processing. The Department will be reimbursed from monies due the Contractor for a decrease in emulsified asphalt content in the amount equal to the purchase price F.O.B. the project delivery point.

Subsection 415.02, (**Delete** the third paragraph) "When milling the Interstate…"

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

March 1, 2006

Rev. 07-01-07
Rev. 12-13-2010

Supplemental Specifications - Section 500

of the

Standard Specifications for Road and Bridge Construction

March 1, 2006

Subsection 501.03, Remove and Replace the entire subsection with the following:

501.03-Proportioning and Quality Assurance of Concrete.

A. Proportioning :

The Contractor shall submit the proposed concrete design to the Engineer for approval. The design shall be determined using saturated surface dry aggregate weights and shall be verified by the use of trial batches meeting the requirements of these specifications. The concrete design shall be prepared by a TDOT certified Class 3 concrete plant technician, or by an approved independent testing laboratory under the direction of a registered professional civil Engineer, licensed by the State of Tennessee. The concrete plant technician or the Civil Engineer shall certify that the information contained on the design is correct and is the result of information gained from the trial batches. Trial batches for design, including admixtures in the proper proportion, shall be built no more than 90 days prior to the design submittal. All cost of concrete design, preparation and submittal shall be the responsibility of the Contractor.

The concrete design shall be air entrained and produce a workable concrete mix meeting the following design and production parameters:

CLASS CP - PAVING CONCRETE

28 day Compressive strength, min. (PSI)	**Minimum cementitous content (pounds per CY)**	**Maximum Water/cement ratio (lb/lb)**	**Air Content (%)**	**(inch)**
3000	526[1] 545[2]	0.49	5% design 3-8 % production	0-2.0[3] 3±1[4]

[1]-526 lbs required when the coarse aggregate is crushed stone
[2]-545 lbs required when the coarse aggregate is gravel
[3]-Allowable slump for slipform paving
[4]-Allowable slump for other than slipform paving

Chemical Admixtures shall be included in the concrete mixture as specified in the following table based on the ambient air temperature and expected weather conditions.

Class of Concrete	**Temperature less than 85° F(30 ° C) and falling**	**Temperature 85° F(30° C) or greater and rising**
CP	Type A or Type F	Type D or Type G

Admixtures to be incorporated into the concrete shall all be from the same manufacturer, shall be incorporated into the concrete in accordance with the manufacturer's recommendations, subject to approval by the Engineer.

The proposed concrete design submittal shall contain as a minimum the following information:

Source of all aggregate
Brand and type of cement
Source and class of fly ash (if used)
Source and grade of ground granulated blast furnace slag (if used)
Specific gravity of cement
Specific gravity of fly ash (if used)
Specific gravity of ground granulated blast furnace slag (if used)
Admixtures (if used)
Gradation of aggregates
Specific gravities of aggregates (saturated surface dry)
Air content (if air entrainment is used)
Percentage of fine aggregate of the total aggregate (by volume)
Slump
Weight per cubic yard(m3)
Yield
Temperature of plastic concrete
Water/cement ratio lb./lb.(kg/kg)
7 day compressive strength [minimum of 3 x 6-in. x12in. (150mm x 300mm) cylinders]
14 day compressive strength [minimum of 3 x-6in. x12in.(150 x 300 mm) cylinders]
28 day compressive strength [minimum of 3 x-6in. x12in.(150mm x 300mm) cylinders]
Weight of each material required to produce a yd3(m3) of concrete

In lieu of the above mix design submittal, the Contractor may submit for approval to use an existing design (Contractor or Department prepared) approved by the Department within the current calendar year. The approval of this concrete design submittal will not relieve the Contractor of the responsibility of providing concrete meeting the requirements of these specifications. A temporary mix design may be issued if the 7 day compressive strengths exceed the required 28 day strengths.

If materials from sources other than those shown on the approved concrete design are to be used, the Contractor must submit and obtain approval of a concrete design showing these sources. No concrete shall be accepted with materials that are not shown on an approved concrete design.

In addition to the option to use Type I-SM cement, the contractor may have the option to replace a portion of Type I cement in Portland cement concrete, up to a maximum specified herein, with fly ash and/or ground granulated blast furnace slag. It is the Contractors responsibility, if he chooses to use fly ash and/or ground granulated blast furnace slag as a partial cement replacement, to provide Portland cement concrete of the design strengths specified in all applicable special provisions, on the plans, or in the standard specifications. Type I-SM cement or Type I cement with fly ash or ground granulated blast furnace slag as a partial cement replacement will not be used in concrete when high early strength is specified. When the Contractor elects to replace a portion of Type I cement with fly ash and/or ground granulated blast furnace slag, the following requirements must be verified prior to producing any Portland cement concrete:

1. Fly ash or ground granulated blast furnace slag shall be stored in silos separate from each other and separate from the Type I cement.
2. The fly ash or ground granulated blast furnace slag is to be added to the concrete by methods and equipment approved by the Engineer, capable of uniformly distributing the materials throughout the mix.
3. The fly ash or ground granulated blast furnace slag may be weighed cumulatively in the weigh hopper with the cement, provided the cement is added first. The temperature of the fly ash or the ground granulated blast furnace slag is not to exceed 160° F(71° C) at the time of introduction to the mix.
4. The mix shall be closely monitored to maintain a consistent air content between 3%and 8%.

Additional testing may be required to verify desired properties of Portland cement concrete with fly ash or ground granulated blast furnace slag. Additional compensation for the expense and/or lost production due to the additional testing will not be allowed the Contractor. The following are examples of additional testing that may be required:

1. Additional air test as felt necessary by the Engineer to monitor the entrained air due to fluctuations in LOI and fineness of the fly ash or ground granulated blast furnace slag material.
2. Additional compressive test specimens may be needed to determine strengths for form removal due to the slowed strength development inherent with fly ash or ground granulated blast furnace slag concrete.

Design of Portland cement concrete with Type I cement modified by the addition of fly ash or ground granulated blast furnace slag. The following table indicates that maximum cement replacement rates (by weight) and minimum substitution ratios(by weight) for the type of modifier specified:

Modifier	Cement Replacement Rate(Maximum)% (by weight)	Minimum Modifier Cement Substitution Rates (by weight)
Ground Granulated Blast Furnace Slag(GGBFS) (grade 100 or 120)	35.0	1:1
Class "F" Fly Ash	20.0	1:1
Class "C" Fly Ash	25.0	1:1

Ternary cementitious mixtures (mixtures with portland cement, GGBFS, and fly ash) will be allowed for Class CP Concrete provided that the minimum portland cement content is 50%. The maximum amount of fly ash substitution in a ternary blend will be 20%. Substitution rates will be at a 1:1 ratio.

Any request for a change in source of materials or admixtures from the original mix design must be made in writing to the Regional Materials and Tests Engineer explaining the necessity for the change and must be accompanied by a new mix design in accordance with the above provisions. No concrete shall be placed until the new design is approved.

When requested by the Contractor and approved by the Engineer, Class A Concrete for structures, as provided for under **Section 604** and herein modified, will be permitted for use in variable width sections, ramps, and on projects containing 10,000 yd^2(m^2) of concrete pavement or less. The slumpshall be modified to be a maximum of 3 in.(75 mm) and the compressive strength of cylindrical specimens molded, cured and tested in an approved laboratory shall be not less than 3,000 psi(20.7 MPa) in 28 days. No additional payment will be made to the Contractor for increased costs due to the use of the above mixture.

The mix proportions approved by the Department shall govern during the progress of the work, except the Contractor shall make the following adjustments with the approval of the Engineer:

(a) If the cement content of the concrete varies by more than 2% from the designated value, as determined by AASHTO T 121, the proportions will be so adjusted as to maintain a cement content which does not vary more than 2% from the designated value.
(b) If it is found impossible to obtain concrete of the desired plasticity and workability with the proportions originally designed, changes will be made in aggregate weights as required, provided that in no case shall the cement content originally designated be changed except as provided in paragraphs (c), (d) and (e).
(c) If it is found impossible to produce concrete having the required consistency without exceeding the maximum allowable water-cement ratio specified, the cement content shall be increased so that the maximum allowable water-cement ratio will not be exceeded.

(d) If for any reason the concrete must be placed by hand methods and the water-cement ratio established for the vibrated concrete cannot be maintained, the mix proportions shall be adjusted for placement by hand methods and the cement proportion increased by 38 lbs per cubic yard(22 kgs per m3), or more if necessary in order to maintain the water-cement ratio established for the vibrated concrete. No additional payment will be made to the Contractor for the cost of the additional cement.
(e) Change the mix proportions because of a change in the character or source of materials.
(f) Change the mix proportions or mixing procedure in order to maintain the air content within the specified limits.
(g) Change the mix proportions made necessary by the use of retarders or other chemical additives that may be required or approved.

B. Quality Control and Acceptance of Concrete:

It shall be the responsibility of the Contractor to determine and measure the batch quantities of all ingredients (including all water and any specified or approved admixtures) for all concrete produced for the project and to mix, deliver and place the concrete so that the concrete meets the requirements of these specifications. The minimum size of a batch shall be 2.5 cubic yards(2.0 m^3). Sampling, testing and inspection for process control of the concrete at the concrete plant shall be performed by a TDOT Class 2 or higher concrete plant technician certified by the Department. This technician must be present at the concrete plant during all batching operations for the project and his primary responsibility during production shall be process control. Sampling, testing and inspection for process control of the concrete at the placement site shall be performed by a concrete technician that holds a TDOT Class 1, ACI Class 1, or higher certification. A technician shall be present at each placement site during all concrete placement. All necessary equipment required for process control shall be furnished by the Contractor and shall be at the plant and at the placement site at all times during concrete placement. Process control shall include, but not be limited to, the following tests and inspections:

1. Test to determine aggregate gradations (AASHTO T 27 with AASHTO T 11 when required).
2. Frequent inspections of the stockpile to ascertain that stockpiles are being maintained in an uncontaminated and unsegregated manner. A current aggregate quality report shall be kept at the plant.
3. Calibration of weighing systems, water meters and admixture dispensing systems prior to starting production.
4. Assurance of accurate weighing of the aggregates and cement, the proper metering of water and admixtures and the quality of water.
5. Assurance that mixing equipment is in proper working condition and the proper mixing speeds and revolutions are controlled as required by the specifications and the Materials and Tests Circular Letter File book.
6. Adjustment of mix proportions due to moisture content of both coarse and fine aggregates (moisture determination to be in accordance with AASHTO T 255).
7. Slump (AASHTO T 119) and Air Test (AASHTO T 152).

8. Yield test (AASHTO T 121) (When yield varies more than ±2% from that shown on the design. All batching operations shall cease until the problem has been identified and corrected or a new concrete design has been obtained.
9. Quality control cylinders and early break cylinders (7-14 day, etc), for compression tests in accordance with AASHTO T 22.
10. Tests for concrete and ambient air temperatures.
11. A report furnished daily to the Engineer showing all pertinent information (Date, Contract and Project, Item number(s), batch weights, moisture corrections, admixtures, slump, air content, temperatures, etc.). A sample daily report will be given to the Contractor as an example.
12. A concrete delivery ticket must accompany each load to the placement site. The ticket shall at a minimum include the following:

    Date
    Contract number
    County
    Class of concrete
    Concrete design number
    Number of cubic yards
    Load number
    Truck number
    Maximum water allowed by design
    Total water added at the plant
    Maximum water allowed to be added on the project
    Actual water added on project
    Number of revolutions at mixing speed at plant
    Number of revolutions at mixing speed at project
    Time loaded
    Time discharged
    Actual and target batch weights of each component including each aggregate, chemical admixture and mineral admixture used.

The Contractor shall develop for approval of the Engineer and maintain at the plant written procedures for sampling, testing and inspection of the concrete. The Contractor shall keep a record of all tests and inspections performed at the plant site and placement site, and this documentation, together with a certification by the Contractor that the concrete incorporated in the work meets the requirements of the specifications, shall be delivered to the Engineer upon completion of the project for inclusion in the project records. Records shall be kept current and shall be made available to the Engineer for review at any time.

It shall be the responsibility of the Contractor to properly make, cure and transport all early break cylinders (7-14 day, etc.) in accordance with AASHTO T 23 and delivered to the Regional laboratory or other established satellite laboratories for tests.

The Department or their representative shall be responsible for performing all acceptance tests. A TDOT Level 1 Certified or ACI Certified Technician shall sample, test air content and slump, and prepare 28 day cylinders for acceptance. The Department shall also be responsible for properly curing and transporting all acceptance cylinders in accordance with AASHTO T 23.

All independent assurance sampling and testing shall be performed by the Department. All sampling and testing for acceptance and independent assurance shall be at the frequencies established in TDOT Procedures. The time and location for obtaining all acceptance and assurance samples will be determined by the Department.

It shall be the responsibility of the Contractor to provide cylinder molds, a wheelbarrow, and provide a level site to perform testing and for initial curing. The Contractor shall also provide a secure storage shed/building for temporary storage of concrete acceptance cylinders in accordance with **Subsection 722.09** of these Specifications.

A TDOT certified class 2 or higher concrete technician, whose duty is process control, shall be at the ready-mix plant during all batching operations. A TDOT or ACI certified class 1 or higher technician is not required to be at the placement site during all small quantity placing operations but is required to perform one complete set of tests during the life of the project. A delivery ticket must accompany each load delivered to the job site.

Batch weights shall be corrected to compensate for any surface moisture on the aggregate at the time of use. The Contractor may elect to withhold some of the water from the mix at the plant provided the delivery ticket indicates the amount of water withheld. If a portion of the water is withheld at the plant, additional water may be added at the work site provided the design water/cement ratio of the mix is not exceeded.

Subsection 501.09, Revise the fifth paragraph to the following:

The tolerance of the individual quantity of each cementious material shall be no less than 1% nor no more than 4% of the required weight. Aggregates shall be weighed within a tolerance of 1.5% of the required weight.

Subsection 501.17, 2nd full paragraph on page 321, Change the first sentence from "When the pavement being constructed abuts an adjacent pavement" TO:

When the pavement being constructed longitudinally abuts an adjacent pavement

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

(Rev. 03-23-09) March 1, 2006
(Rev. 02-08-10)
(Rev. 12-13-10)
(Rev. 05-09-2011)
(Rev.06-25-2012)
(Rev. 04-07-2014)

Supplemental Specifications - Section 600

of the

Standard Specifications for Road and Bridge Construction

March 1, 2006

Subsection 602.05 (d) Paragraph one, **Change** 1125°F to 1100°F, **Change** 600°C to 593°C, **Change** the acronym, **ASSHTO** to **AASHTO**

Subsection 602.05 (d) Paragraph one, eighth sentence, and in the table below paragraph one, **Delete** the following:

Grades 70W, 100 and 100W, and **Replace** with Grades HPS70W, and HPS100W

Subsection 602.05 (d) Paragraph one, eighth sentence **Delete** "only under rigidly controlled procedures" and **Replace** with the following:

"as set forth in the **AASHTO** Guide Specification for Highway Bridge Fabrication with High Performance Steel", current edition and the **AASHTO** "Bridge Welding Code", current edition.

Subsection 602.05 (d) Paragraph two, first sentence, **Add** "or either"

"temperature indicating crayons, liquids, or either contact or non-contact…"

Subsection 602.05 (e) 3 First paragraph, **Delete** the first sentence and **Replace** with the following

"The heat-curving operation shall be conducted in such a manner that the temperature of the steel does not exceed 1200°F (649°C) for Grades 36, 50, 50W and HPS50W; and 1100°F (593°C) for Grades HPS70W and HPS100W as measured by temperature-indicating crayons or other suitable means."

Section 602.17 Delete all references to **AASHTO M 253 (ASTM A 490**) bolts unless otherwise noted on the plans.

Subsection 602.17 (D) Delete the first sentence and replace with the following

"The following provisions apply when high strength bolts are installed in the field or shop."

Table 602.17 A-BOLT TENSION, page 352 Delete the table conversion values for kilograms

Replace with (Newton) values

TABLE 602.17A-BOLT TENSION
Minimum Bolt Tension (1)
in Pounds (Newton)

Bolt Size in inches(mm)	**AASHTO M 164 (ASTM A 325)** Bolts	**AASHTO M 253 (ASTM A 490)** Bolts
1/2(13 mm)	12,000(53,379)	15,000(66,723)
5/8(16 mm)	19,000(84,516)	24,000(106,757)
3/4(19 mm)	28,000(124,550)	35,000(155,688)
7/8(22 mm)	39,000(173,481)	49,000(217,963)
1(25 mm)	51,000(226,859)	64,000(284,686)
1-1/8(28 mm)	56,000(249,100)	80,000(355,858)
1-1/4(32 mm)	71,000(315,824)	102,000(453,719)
1-3/8(35 mm)	85,000(378,099)	121,000(538,235)
1-1/2(38 mm)	103,000(458,167)	148,000(658,337)

Subsection 602.17(E) 1 b7 Change "bolt diameter", and "(kips) number", in the table

"(in) 1-1/6 to 1-1/2", "(kips) 42 to 45"

Subsection 602.17(E) 2(a) 2. Change "16mm" to "1.6mm"

Subsection 602.17(E) 2 (b) 5. Change some information in table

1/2 rotation: **Change** "≥ 8 x" to, "≤ 8 x bolt dia."

2/3 rotation: **Change** "≥ 8 x" to, "> 8 x but < 12 x bolt dia."

Subsection 602.17(E) 2 (b) 6. (**Change** some information in table)

Bolt Length (measured in Step 1	4 x bolt dia. or less	> 4 bolt ≤ 8 x bolt dia.	> 8 x bolt dia.
Required Rotation	2/3	1	1-1/3

Subsection 602.19-Welds. Include the following as revisions to the **AASHTO/AWS** "Bridge Welding Code"

Delete 6.1.3.4(1) and 6.1.3.4(2)

Subsection 602.19-Welds. First paragraph, page 363; **Add** the word "joint";

"Complete joint penetration groove welds…"

Subsection 602.26 (b); Replace the "**THICKNESS IN INCHES (MILLIMETERS)"** Table with the following

MINIMUM COLD-BENDING RADII				
Thickness Inches (t)	Up to 3/4	Over 3/4 to 1, incl.	Over 1 to 2, incl.	Over 2
36	1.5t	1.5t	1.5t	2.0t
50	1.5t	1.5t	2.0t	2.5t
50W	1.5t	1.5t	2.0t	2.5t
HPS70W	1.5t	1.5t	2.5t	3.0t
100	1.75t	2.25t	4.5t	5.5t
100W	1.75t	2.25t	4.5t	5.5t

Subsection 602.26 (b) Second paragraph, after the Table, **Change** "HPS100W" to "HPS70W"

and **Change** "1125°F" to "1100°C", and "607°C" to "593°C"

Subsection 602.29 First paragraph, last sentence, **Change** "56°C" to "38°C"

Subsection 602.29 Third paragraph, last sentence, **Change** the last sentence to read as follows

"The holding temperature for stress relieving **ASTM** A709 Grade HPS70W HPS100W steels shall not exceed 1100°F (593°C)."

Subsection 602.29 Fourth paragraph, first sentence, **Delete** "Section 4.4" after the wording; and **Replace** with "paragraph 3.9", **Delete** AWS D1.1 and **Replace** with **AASHTO/AWS** D1.5 "Bridge Welding Codes"

Subsection 602.35 Fifth paragraph, **Delete** reference to "Table 602.35"

Subsection 602.35 (b), **Delete** this section

Section 602.39- Add the following as the last paragraph

Shear Stud Connectors - After the beams have been erected, the contractor shall be required to attach the shear stud connectors in compliance with OSHA standards. The studs shall be installed in the locations shown in the plans. The contractor will be required to install and test shear studs in accordance with the latest version of AASHTO/AWS D1.5M/D1.5, Chapter 7 Stud Welding. The surface receiving the studs shall be cleaned by shot blasting or grinding to a bright metal surface immediately prior to welding. All studs shall be welded using automatically timed stud welding equipment only. At the beginning of each day or shift each individual welder/operator and equipment must complete the Production Control/ Pre-production testing as stated in section 7.7.1. Only individuals who repeatedly demonstrate satisfactory installation shall be allowed to install the shear studs. The contractor is responsible for the quality of all welds.

The Department shall inspect and randomly test the welds before any reinforcing steel is placed.

Subsection 602.41 Last sentence, **Add** the wording "Plans and"

"in accordance with **Subsection 105.02**, Plans and Working Drawings."

602.41 Replace entire subsection with the following:

602.41-Temporary Supports. Temporary supports for steel beam erection shall be properly designed, constructed and maintained to support the loads to which they will be subjected. The Contractor shall prepare and submit to the Engineer construction drawings for temporary supports and working drawings for changes in any existing structure necessary for safely maintaining traffic, in accordance with Subsection 105.02, Plans and Working Drawings.

Subsection 602.42 Add " and stamped" after "prepared" in the first sentence.

Subsection 602.43 (a) Change the third sentence to read as follows:

"In no case shall the maximum temperature of the **ASTM** A 709 Grade HPS100W, and the HPS70Wsteels exceed 1100°F (593°C)."

Subsection 602.43 (a) Add the following to the end of the first paragraph;

"or infrared thermometers (conductor or non-conductor)

Subsection 602.43 (b) Add the wording "HPS70W, and HPS100W," after the word "Grade"

Subsection 602.47 (d) Delete the second sentence of the second paragraph, and **replace** with the following;

"When the contractor has approval to drill holes for setting anchor bolts, the bolts shall be set accurately, and fixed by completely filling the holes with grout meeting the requirements of **Subsection 918.21**."

Subsection 602.49 (d) Add metric equivalents in (kg)

Weight per 100
Bolts, pounds (kg)
19.7 (8.9)
31.7 (14.4)
52.4 (23.8)
80.4 (36.5)
116.7 (52.9)
165.1 (74.9)
212.0 (96.2)
280.0 (127.0)
340.0 (154.2)

(e) Add metric equivalents in (kg/m)

Pounds per Linear Foot (kg/m)
0.20 (0.30)
0.25 (0.37)
0.35 (0.52)
0.55 (0.82)
0.80 (1.19)
1.10 (1.64)
1.50 (2.23)
2.00 (2.98)

Subsection 602.50 (a) Change the name of section (a) to read as follows

(a) Structural Steel – Per Pound (Kilogram)

Section 603, Second paragraph, **Revise** the first sentence by adding the following:

"Effective Lettings after January 01, 2007," All contractors or subcontractors…

Subsection 604.02 Revise entire subsection as follows:

604.02-Materials. Materials used in this construction shall meet the requirements of the following sections or Subsections of Division III, Materials, of these Specifications.

Material	**Section or Subsection**
Water	**918.01**
Hydraulic cement[1]	**901.01**
Fine Aggregate, (all Classes of concrete)	**903.01**
Coarse Aggregate	
For Class A Concrete: Size No. 57	**903.03**
For Class D Concrete: Size No. 57	**903.03**
For Class L Concrete	**903.19**
Fly Ash	**918.31**
Ground Granulated Blast Furnace Slag	**918.32**
Cement Concrete Curing Materials	**913**
Air-Entraining Admixtures	**918.09**
Steel Bar Reinforcement	**907.01**
Welded Steel Wire Fabric	**907.03**
Waterstops	**918.11**
Joint Filler, Preformed Type	**905.01**
Structural Steel	**908.01**
Applied Texture Finish	**918.30**

[1]Type I, Type I-SM or Type I cement with either fly ash and/or ground granulated blast furnace slag as a partial cement replacement shall be used unless otherwise specified or permitted. When Type I cement with either fly ash and/or ground granulated blast furnace slag as a partial cement replacement is used, the requirements of **Subsection 604.03** shall apply.

Steel Castings	**908.05**
Elastomeric Bearing Pads	**908.12**
Bronze Bearing Plates, Plain	**908.09**
Bronze Bearing Plates, Self-Lubricating	**908.10**
Paints	**910**
Chemical Additives for Concrete	**918.09**
Gray Iron Castings	**908.07**
Permanent Steel Bridge Deck Forms	**908.03**
Precast Prestressed Bridge Deck Panels	**918.29**
Precast Concrete Box Culverts	**914.08**

Fly ash or ground granulated blast furnace slag of different classes or sources used as partial replacement for Portland cement in concrete mixes will not be permitted. FlyAsh or Ground Granulated Blast Furnace Slag shall only be permitted as a partial cement replacement in Type I Portland Cement. A maximum of 20% fly ash shall be permitted as a partial hydraulic cement replacement in Type I-SM cement only in Class A concrete.

Concrete with fly ash as a partial cement replacement shall not be produced until the concrete supplier furnishes the following information to the Engineer:

1. Copies of the results of all tests performed by the fly ash producer within the previous 30 days, on shipments to the concrete supplier showing:

   Fineness (percent retained on the No. 325(45μm) sieve)
   LOI (loss on ignition)
   Specific gravity
   Soundness (autoclave expansion)
   Moisture content
   Pozzuolanic activity, 7 day cement

2. A notarized certification from the fly ash producer stating that the fly ash meets the Departments specifications.

Concrete with ground granulated blast furnace slag as a partial cement replacement shall not be produced until the concrete supplier furnishes the following information to the Engineer:

1. Copies of the results of all tests performed by the ground granulated blast furnace slag producer within the previous 30 days on shipments to the concrete supplier showing:

   Fineness (percent retained on the No. 325(45μm) sieve.
   Air content of slag mortar
   Individual sample slag activity index (percent)
   Specific gravity
   Sulfide sulfur(s) (percent)
   Sulfate ion reported as SO_3 (percent)
   Total alkalies ($Na_2O+0.658K_2O$)
   Compressive strength (28 day)

2. A notarized certification from the ground granulated blast furnace slag producer stating that the slag meets the Departments specifications.

Unless otherwise indicated on the plans, the Contractor may substitute precast reinforced box sections meeting the requirements of Subsection 914.08, AASHTO specifications for all fill heights for cast in place concrete box sections. The Contractor is only required to notify the project engineer and the Division of Structures that he intends to utilize sections fabricated to the appropriate AASHTO Materials Specifications or the other pre-approved sections contained in the Division of Structures Standard Drawings for Precast Boxes. Should he elect to construct precast boxes of a different design, the Contractor shall submit shop drawings of the proposed precast box section and design calculations to the Structures Division for approval prior to construction. As a minimum, the shop drawings shall include a plan and elevation view of the box culvert showing all precast sections, a typical precast box section showing dimensions and reinforcing, and notes and details required for construction. After securing the necessary approval, the Contractor shall furnish the Structures Division a permanent, 100 µm(4 mil) mylar reproducible of the design for their file. The Contractor will be paid for the precast box based on the price bid for the quantity of the items in the cast in place structure it replaces. The precast reinforced box sections shall be manufactured in accordance with Departmental procedures

Subsection 604.03 Remove and Replace entire subsection with the following:

604.03-Classification Proportioning and Quality Assurance of Concrete.

(a) Classification and Proportioning and Quality Assurance

Min. 28 Day Comp.Strength PSI (MPa)	Min. lbs. (kg) Cement per C.Y. (C.M..)	Maximum Water/Cem. lb/lb (kg/kg)	Air Content % (Design± production tolerance)	Slump in. (mm)
	CLASS A CONCRETE			
3,000 (20.7)	564 (335)	0.45	6 ± 2	3 ± 1[1] (75 ± 25)
	CLASS D CONCRETE[2&3]			
4,000 (27.6)	620 (368)	0.40	7[3]	8 max[4] (200 max.)
	CLASS L CONCRETE[5&3]			
4,000 (27.6)	620 (368)	0.40	7[3]	8 max[4] (200 max.)
	CLASS S (SEAL) CONCRETE[6]			
3,000 (20.7)	682 (405)	0.47	6 ± 2	6±2 (150 ± 50)

The proportioning of the concrete shall be based on a predetermined minimum cement content, and the water-cement ratio shall not exceed the maximum shown in the above table. Below this limit, the quantity of water shall be adjusted to meet the slump requirements. The fine aggregate shall not exceed 44% by volume calculation of the total aggregate with the exception of slip formed Class A concrete incorporated into parapets and median barriers. For slip formed parapet and median barriers exclusively, the percentages of fine and coarse aggregate in an approved concrete mix design may be adjusted ± 2%, such that the maximum percent by volume of fine aggregate does not exceed 46%. Mixture adjustments shall be documented in the field book and daily concrete report. Adjusted mix shall comply with all performance criteria specified in **Section 604**.

[1] For slip forming, the slump shall range from 0 to 3 inches.

[2] Class D concrete shall be used in all bridge decks except box and slab type structures unless otherwise noted on the plans.

[3] Design Class D and Class L concrete at 7% air content. Acceptance range for pumping and other methods of placement is 4.5-7.5%. Sampling will be at the truck chute. Sampling will be at the truck chute.

[4] Water reducing admixtures are acceptable, however, the maximum water/cement ratio shall not be exceeded in order to achieve the required slump.

[5] The unit weight of air dried Class L Concrete (lightweight concrete) shall not exceed 115 lbs./c.f. (185 kgs/0.1 m^2) as determined by ASTM C 567.

[6] The Use of Fly Ash as a cement replacement will be allowed in Class S (Seal) concrete.

Chemical Admixtures shall be included in the concrete mixture as specified in the following table based on the ambient air temperature and expected weather conditions.

Class of Concrete	Temperature less than 85°F (30°C) and falling	Temperature 85°F (30°C) or greater and rising
A	Type A or F	Type D or G or A and B
D	Type A or F	Type A or F and B or G
L	Type F	Type F and B or G
S	Type D or G or A and B	Type D or G or A and B

If a Type A, F, or G water reducer is used, then the allowable slump shall be maximum of 8 in. (200 mm).

Admixtures to be incorporated into the concrete shall all be from the same manufacturer, shall be compatible, and shall be incorporated into the concrete in accordance with the manufacturer's recommendations.

The fine aggregate in all Class L Concrete shall be natural sand conforming to the requirements of **Subsection 903.01.**

Fine aggregate manufactured from limestone or other polishing aggregates will not be permitted in concrete to be used as a riding surface in traffic lanes.

The Contractor shall submit the proposed concrete design to the Engineer for approval. The design shall be determined using saturated surface dry aggregate weights and shall be determined by the use of trial batches meeting the requirements of these specifications. The concrete design shall be prepared by a TDOT certified Class 3 concrete technician or approved independent testing laboratory under the direction of a registered civil Engineer licensed by the STATE OF TENNESSEE. The concrete plant technician or the civil Engineer shall certify that the information contained on the design is correct and is the result of information gained from the trial batches. The concrete design shall produce an average compressive strength to indicate that the specified 28 day strength can be obtained in the field. All strength determinations shall be made on equipment meeting the requirements of and in the manner prescribed by AASHTO T 22. It is the contractor’s responsibility to provide concrete of the design strength specified in all applicable special provisions, plans, and/or standard specifications. Trial batches for design shall be built no more than 90 days prior to the design submittal. All cost of concrete design, preparation and submittal shall be the responsibility of the Contractor.

The proposed concrete design submittal shall contain as a minimum, the following:

Source of all aggregates
Brand and type of cement
Source and class of fly ash (if used)
Source and grade of ground granulated blast furnace slag (if used)
Specific gravity of cement

Specific gravity of the fly ash (if used)
Specific gravity of the ground granulated blast furnace slag (if used)
Admixtures (if used)
Gradations of aggregates
Specific gravity of aggregates (saturated surface dry)
Air content (if air entrainment is used)
Percentage of fine aggregate of the total aggregate (by volume)
Slump
Weight per c.y. (m^3)
Yield
Temperature of plastic concrete
Water/cement ratio lb/lb (kg/kg)
7 day compressive strength [minimum of 3 x 6-in. x12in. (150mm x 300mm) cylinders]
14 day compressive strength (minimum of 3-6 in.x 12 in. (150 mm x 300 mm) cylinders
28 day compressive strength (minimum of 3-6 in.x 12 in. (150mm x 300mm) cylinders
Weight of each material required to produce a c.y. (m^3) of concrete

In lieu of the above mix design submittal, the Contractor may submit for approval an existing design approved by the Department within the current calendar year. The approval of this concrete design submittal will not relieve the Contractor of the responsibility of providing concrete meeting the requirements of these specifications. A temporary mix design may be issued if the 7 day compressive strengths exceed the required 28 day strengths.

Any request for a change in source of materials or admixtures from the original mix design must be made in writing to the Regional Materials and Tests Engineer explaining the necessity for the change and must be accompanied by a new mix design in accordance with the above provisions. The Contractor shall place no concrete until the new design is approved.

Concrete with fly ash or ground granulated blast furnace slag as a partial cement replacement will not be used in concrete when high early strength is specified. When the Contractor elects to replace a portion of hydraulic cement with fly ash or ground granulated blast furnace slag, the following requirements must be verified prior to producing any concrete:

5. Fly ash or ground granulated blast furnace slag shall be stored in silos separate from each other and separate from the hydraulic cement.
6. The fly ash or ground granulated blast furnace slag is to be added to the concrete by methods and equipment approved by the Engineer, capable of uniformly distributing the materials throughout the mix.
7. The fly ash or ground granulated blast furnace slag may be weighed cumulatively in the weigh hopper with the cement, provided the cement is added first. The temperature of the fly ash or the ground granulated blast furnace slag is not to exceed 160° F(71° C) at the time of introduction to the mix.

Design of Portland cement concrete with Type I cement modified by the addition of fly ash and/or ground granulated blast furnace slag. The following table indicates the maximum cement replacement rates(by weight) and minimum substitution ratios(by weight) for the type of modifier specified:

Modifier	**Cement Replacement Rate** (Maximum)% (by weight)	**Minimum Modifier Cement Substitution Ratio** (by weight)
Ground Granulated Blast Furnace Slag (grade 100 or 120)	35.0	1:1
Class F Fly Ash	20.0	1:1
Class C Fly Ash	25.0	1:1

Ternary cementitious mixtures (mixtures with Portland cement, ground granulated blast furnace slag, and fly ash) will be allowed for Class A Concrete provided that the minimum Portland cement content is 50%. The maximum amount of fly ash substitution in a ternary cementitious mixture will be 20%. Type I-SM cement will be allowed with ternary cementitious mixtures. When a Type I-SM cement is used, no additional slag shall be used as a partial replacement for the hydraulic cement.

(b) Quality Control and Acceptance of Concrete

It shall be the responsibility of the Contractor to determine and measure the batch quantities of all ingredients (including all water and any specified or approved admixtures) for all concrete produced for the project and to mix, deliver and place the concrete so that the concrete meets the requirements of these specifications. The minimum size of a batch shall be 2.5 c.y. (2.0 m3). The Contractor shall have a TDOT Class 2 or higher certified technician at the concrete plant during all batching operations with the primary responsibility of process control, which includes all sampling, testing and inspection of the aggregate and concrete.

The Contractor shall have a TDOT or ACI certified Class 1 or higher technician for all sampling, testing and inspection for process control of the concrete at the placement site. A technician shall be present at each placement site during all concrete placement. The technician at both the plant and job site shall be authorized to promptly correct any deficiencies in quality control within approved design parameters. All necessary equipment required for process control shall be furnished by the Contractor and shall be at the plant and at the placement site at all times during concrete and placement.

Process control shall include, but not be limited to, the following test and inspections:

1. Test to determine aggregate gradations (AASHTO T 27 with AASHTO T 11 when required).
2. Frequent inspections of the stockpile to ascertain that stockpiles are being maintained in an uncontaminated and un-segregated manner. A current aggregate quality report shall be kept at the plant.
3. Calibration of weighing systems, water meters and admixture dispensing systems prior to starting production.
4. Assurance of accurate weighing of the aggregates and cement, the proper metering of water and admixtures and the quality of water.

5. Assurance that mixing equipment is in proper working condition and the proper mixing speeds and revolutions are controlled as required by the specifications and the Materials and Tests Circular Letter File book.
6. Adjustment of mix proportions due to moisture content of both coarse and fine aggregates (moisture determination to be in accordance with AASHTO T 255).
7. Slump (AASHTO T 119) and Air Test (AASHTO T 152 - AASHTO T 196 required for concrete containing light weight aggregate).
8. Yield test (AASHTO T 121) (When yield varies more than ±2% from that shown on the design. All batching operations shall cease until the problem has been identified and corrected or a new concrete design has been obtained.
9. Quality control cylinders and early break cylinders (7-14 day, etc) for compression tests in accordance with AASHTO T 22.
10. Tests for concrete and ambient air temperatures.
11. A report furnished daily to the Engineer showing all pertinent information (Date, Contract and Project, Item number(s), batch weights, moisture corrections, admixtures, slump, air content, temperatures, etc.). A sample daily report will be given to the Contractor as an example.
12. A concrete delivery ticket must accompany each load to the placement site. The ticket shall at a minimum include the following:

    Date
    Contract number
    County
    Class of concrete
    Concrete design number
    Number of cubic yards
    Load number
    Truck number
    Maximum water allowed by design
    Total water added at the plant
    Maximum water allowed to be added on the project
    Actual water added on project
    Number of revolutions at mixing speed at plant
    Number of revolutions at mixing speed at project
    Time loaded
    Time discharged
    Actual and target batch weights of each component including each aggregate, chemical admixture, and cementitious material used.

The Contractor shall develop for approval of the Engineer and maintain at the plant written procedures for sampling, testing and inspection of the concrete. The Contractor shall keep a record of all tests and inspections performed at the plant site and placement site and this documentation, together with a certification by the Contractor that the concrete incorporated in the work meets the requirements of the specifications, shall be delivered to the Engineer upon completion of the project for inclusion in the project records. Records shall be kept current and shall be made available to the Engineer for review at any time.

It shall be the responsibility of the Contractor to properly make, cure and transport all early break cylinders (7-14 day, etc.) in accordance with AASHTO T 23 and delivered to the Regional laboratory or other established satellite laboratories for tests.

The Department or their representative shall be responsible for performing all acceptance tests. A TDOT Level 1 Certified or ACI Certified Technician shall sample, test air content and slump, and prepare 28 day cylinders for acceptance. The Department shall also be responsible for properly curing and transporting all acceptance cylinders in accordance with AASHTO T 23.

All independent assurance sampling and testing shall be performed by the Department. All sampling and testing for acceptance and independent assurance shall be at the frequencies established in TDOT Procedures. The time and location for obtaining all acceptance and assurance samples will be determined by the Department.

It shall be the responsibility of the Contractor to provide cylinder molds, a wheelbarrow, and provide a level site to perform testing and for initial curing. The Contractor shall also provide a secure storage shed/building for temporary storage of concrete acceptance cylinders in accordance with **Subsection 722.09** of these Specifications.

An approved concrete design is required for non-critical items involving small quantities of concrete but these non-critical items may be accepted at a reduced testing frequency in accordance with TDOT Procedures. This is to be used for sidewalks, curbs and gutters, building foundations, slope paving, ditch paving, guardrail anchorages, small culvert headwalls 30 in. (750 mm) diameter or less, fence posts, catch basins, manhole bases and inlets, small sign bases and steel strain pole footings.

A qualified plant technician shall be at the ready-mix plant during all batching operations. A field technician is not required to be at the placement site during all small quantity placing operations but is required to perform one complete set of tests during the life of the project. A delivery ticket must accompany each load delivered to the job site.

Pre-approved, pre-packaged concrete mixtures may be used for the applications listed above provided the quantity does not exceed 2 c.y.(1.5 m^3) per day. No design will be required.

Batch weights shall be corrected to compensate for any surface moisture on the aggregate at the time of use. The Contractor may elect to withhold some of the water from the mix at the plant. If a portion of the water is withheld at the plant, additional water may be added at the work site provided the design water/cement ratio of the mix is not exceeded. Water added at the placement site for Class D and Class L concrete shall not exceed one (1) gallon per cubic yard. The total amount of water in the mix shall not exceed the maximum in the approved mix design. Any additional slump shall be achieved using a water reducing admixture. When the addition of water to the mix is made in the field, 30 additional revolutions at mixing speed are required.

(c) High Early Strength

When high early strength concrete is required, in the plans for structural or pavement repairs, or other type work, the use of Type I or Type III cement will be optional with the Contractor. If Type I cement is used, a minimum cement content of 714 lbs/c.y. (424 kgs/m^3) will be required. If Type III cement is used, a minimum cement content of 620 lbs./c.y.(368 kgs/m^3) will be required. High early strength concrete, meeting these requirements, may be substituted at the option of the Contractor for Class A concrete when approved in writing by the Engineer.

When the Contractor elects to use high early strength concrete, the source and gradation of fine and coarse aggregates shall be the same as that specified for the concrete for which the high

early strength concrete is substituted. No additional compensation will be made if the Contractor elects to substitute high early strength concrete for Class A concrete. The unit price for the class of concrete for which the substitution is made shall be full compensation for the concrete.

Subsection 604.04 Page 404, Last paragraph, last sentence

The fogger will be designed to provide a maximum VMD (volume mean diameter) of 15 (microns), and a throw distance of 60 ft. (18m).

Subsection 604.08 (4) Third sentence, **Change** "35mm" to, "#36"

Subsection 604.08 page 412 Fifth paragraph, third sentence, **Change** the word "Uncoated" to "Coated"

Section 604, All sections, after **Subsection 604.11** referencing 604 Subsections are off by one subsection. Therefore **change** them by one, see the example below.

Example: **Change "Subsection 614.12(b)"** to **"Subsection 604.11(b)"**

"Subsection 604.23" to **"Subsection 604.22"**

Subsection 604.13 Revise entire subsection to the following:

The requirements for mixing concrete shall be as prescribed in **Subsection 501.10** for major structures. However, when the concrete is mixed and transported in truck mixers, the time elapsing from when the water is added to the mix until the concrete is deposited in place at the site of the work shall not exceed 90 minutes. When the ambient air temperature exceeds 90° F(32° C), the elapsed time above shall be reduced to 60 minutes for concrete placed in bridge decks. Retempering concrete by adding water or by other means will not be permitted; however, a portion of the mixing water or chemical admixtures may be withheld from transit mixers and added at the work site if all requirements of the approved mix design are met. Water added at the placement site for Class D and Class L concrete shall not exceed one (1) gallon per cubic yard. The total amount of water in the mix shall not exceed the maximum in the approved mix design. Any additional slump shall be achieved using a water reducing admixture. In the event water or chemical admixtures are added at the placement site, the concrete shall be mixed a minimum of 30 revolutions at mixing speed after additions are made. Concrete that is not within the specified slump limits, air content limits, temperature limits or time limits at time of placement shall not be used.

For items of construction specified in **Subsection 604.11(b)**, concrete mixing may be performed by mobile volumetric measuring and mixing equipment as prescribed in **Subsection 604.04** of these Specifications.

When concrete placed in the items of construction specified in **Subsection 604.11(b)** does not exceed 25 c.y.(20 m^3) per day, it may be accepted on the basis of field testing for air, slump, and occasional strength tests with only random plant inspections as deemed necessary by the Engineer for control.

When this basis of acceptance is used, the ready-mix plant furnishing the concrete shall have been inspected and approved for use as provided in **Subsection 604.04**. In addition, the delivery ticket accompanying each load of concrete shall show the class of concrete, the quantity of

cement, aggregates, water, and additives used in the batch, and the time of batching. Materials used in the concrete shall be tested and approved.

Subsection 604.15 Delete the seventh paragraph, "If the acceptance cylinders…"

Subsection 604.16 (a) Delete the twelfth paragraph of this section, "If data collected during…"

Subsection 604.16 page 420 Second and third paragraph, **Replace** with the following:

In hot weather mitigation it will be necessary to apply a certified dry fog with a maximum VMD of 15 (microns) with a throw distance of 60 (ft.) above the concrete surface during the placement and finishing operations. The contractor shall furnish a certification to the project supervisor verifying the VMD.

In addition, immediately before the concrete is placed, the forms and reinforcing steel shall be cooled to 90° F (32° C) or less by using a fine spray of water, leaving no puddles or pockets of water. Trucks shall be sprinkled or kept in the shade when not being unloaded so as to contribute to reducing the temperature of the concrete.

Subsection 604.16 (d) Last sentence, **Change "**m^3" to "$8m^3$"

Subsection 604.16 (e) Second paragraph, second sentence, **change** "8 m" to "6 m",

Subsection 604.19. Add the following as the last sentence**:**

"Refer also to Article 107.02 regarding restrictions on loading during bridge construction"

Subsection 604.21 (d) Remove and Replace entire subsection with the following:

(d)Applied Texture Finish.

Surface preparation prior to the textured finish shall include a Class 1 Ordinary Surface Finish in accordance with Subsection 604.22(a). The concrete shall be in place a minimum of 28 days to allow for ample cure time and weathering of curing compounds prior to application of the textured finish. All surfaces shall be pressure washed just prior to application. Surfaces to be coated shall be free from efflorescence, flaking, coating, rust, dirt, oil and other foreign substances. Coatings shall be applied only to surfaces that are free of surface moisture as determined by sight and touch. Surfaces that are not to receive a Coated Finish are to be shielded and masked. Cracks over 1/8 in.(3 mm) wide are to be veed out and filled with an approved product from the TDOT QPL 13-Section B.5.Structural Materials and Components. The surface preparation shall be approved by the Engineer immediately prior to the beginning of the work.

The textured finish shall be applied in the number of coats as recommended by the manufacturer and as posted on the Departments Qualified Products List to achieve a total application rate of one (1) gallon per 45 (±5) s.f. (0.9 ± 0.1 liter per m^2). If a two coat system is used, the base coat shall be similar in color to mountain gray, **Federal Specification No. 36440,** when the final coat is White, **Federal Specification No. 37886.** When the final coat is similar in color to mountain gray, **Federal Specification No. 36440** a base coat of white, **Federal Specification No. 37886** shall be used**.** The contractor/subcontractor shall give advance notice to the Engineer of the date(s) and time(s) the texture coating is to be applied. The textured finish shall be applied with rollers or brushes so as to provide a consistent and uniform coverage. As an alternative, the Contractor may elect to spray the textured finish if he furnishes a containment system meeting the approval of the Engineer. Regardless of the method of application, drippings

and/or overspray from the texturing process shall be prohibited or otherwise contained in a manner that will not contaminate the environment.

The contractor/subcontractor shall submit to the Engineer certification of the following:

Brand name,
Production batch or lot number,
Qualified Products List Evaluation Number
Manufacturers recommended rate of application,
Materials Safety Data Sheet,
Materials Data Sheet,
Shipping date.
A color sample shall be submitted to the Engineer for approval.

Subsection 604.21 Third paragraph, sentence next to last, **Change** "**Federal Color Standard 594b",** to "**Federal Color Standard 595b"**

Subsection 604.27, Revise the first sentence under the Pavement Roughness Index Table to the following:

"In addition, all areas of pavement roughness index using a 0.1 in. (2.5 mm) blanking band represented by high points having deviations in excess of 0.4 in (10 mm) for any 25 ft. (7.6 m) section per each wheel path shall be corrected."

604.28-Loading and Opening to Traffic. Add the following as the last sentence:

"Refer also to Article 107.02 regarding restrictions on loading during bridge construction"

Subsection 604.31-Basis of Payment. Revise entire subsection to the following**:**

604.31-Basis of Payment. The accepted quantities will be paid for at the respective contract unit price per c.y.(m^3) for Class A Concrete, Class D Concrete, Class L Concrete and Class S Concrete; per lb.(kg) for Steel Bar Reinforcement and Epoxy Coated Reinforcing Steel; and per s.y.(m^2) for Scarifying bridge deck surface and Applied Texture Finish; complete in place.

The concrete fillet above fabricated bridge girders will be paid as bridge deck concrete with the quantities based on the fillet required for a conventional deck forming system. Increases in the aforementioned fillet depth to solely accommodate the Contractor's chosen deck forming system (e.g. precast deck panels) will not to be measured and paid for directly. All costs of this increase will be included in other items bid.

The accepted quantities of leveling concrete shall be paid for at 40% of the price bid for the concrete that is to go into the footing.

Any deduction in monies due to the Contractor for failure to comply with the surface rideability requirements set forth in **Subsection 604.28** shall be make on a lump sum basis.

When field conditions result in the construction of a different type of box culvert or box bridge from that established on the Plans (box type to slab type or vice versa) the respective bid price per c.y.(m^2) for Class A concrete shall be increased by 15% for constructing a slab type in lieu of box type and decreased by 13% for constructing box type in lieu of slab type. No adjustment of Steel Bar Reinforcement unit bid price is to be made for the change in box culvert or box bridge type.

Where concrete does not meet the specified strength but is allowed to be included in the permanent construction as set out in Subsection 604.20, Defective Concrete, or tardy acceptance cylinders and/or cores fail to meet the strengths specified in Subsection 604.15, the following equation shall be used to determine percent payment of contract bid price.

PP = 100-(3*Ds)
PP = Percent Payment
Ds = Percent Below Specified Strength
Ds = [(Specified Strength-Actual Strength)/Specified Strength]*100

Defective concrete greater than 25 percent below specified strength may remain in place at no cost to the Department if approved by the Department of Structures or the contractor may remove and replace.

*Payment to be based on unit price of item as bid, i.e., volume [c.y.(m^3)], length [ft.(m)], each, or other designated bid units. Payment of the above listed percentages includes cost of incidental items such as reinforcing steel when included in the price bid for the Item.

Subsection 606.04 (c) First sentence, **Change** "3(1)" to "1(3)"

Subsection 606.21 Second sentence, **Change** "o1ne" to "one"

Subsection 607.02-Materials. Remove and Replace entire subsection with the following:

607.02-Materials. Materials used in this work shall meet the following requirements:

Material	**Subsection**
Concrete Pipe, Reinforced	**914.02**
Corrugated Metal Pipe Culverts, Pipe Arches and Underdrains	**915.02**
Joint Mortar	**905.02**
Rubber Gaskets	**905.03**
Polyvinyl Chloride Pipe (PVC)	**914.09**
High Density Polyethylene Plastic Pipe	**914.10**

Where Pipe Culverts (Cross Drains & Median Drains) are specified they shall be in accordance with the following:

(a) Pipe Culverts (Cross Drains & Median Drains) 15 through 36 in. (375 through 900 mm) shall be one of the following:

(1) Class III, IV, or V Concrete pipe meeting the requirements of either **Subsection 914.02** or AASHTO M 86.
(2) Metal pipe meeting the requirements of **Subsection 915.02**.
(3) High Density Polyethylene pipe meeting the requirements of **Subsection 914.10**.

(4) Polyvinyl Chloride pipe meeting the requirements of **Subsection 914.09**.

(b) Pipe Culverts (Cross Drains & Median Drains) larger than 36 in. through 48 in. (900 through 1200 mm) shall be one of the following:

(1) Class III, IV, or V Concrete pipe meeting the requirements of either **Subsection 914.02**.
(2) Metal pipe meeting the requirements of **Subsection 915.02**.
(3) High Density Polyethylene pipe meeting the requirements of **Subsection 914.10**.

(c) Pipe Culverts (Cross Drains & Median Drains) larger than 48 in. (1200 mm) shall be one of the following:

(1) Class III, IV, or V Concrete pipe meeting the requirements of Subsection 914.02.
(2) Metal pipe meeting the requirements of **Subsection 915.02**.

Where Pipe Culverts (Side Drains) are specified they shall be in accordance with the following:

(a) Pipe Culverts(Side Drains) 15 through 36 in.(375 through 900 mm) shall be one of the following:

1. Class III, IV, or V Concrete pipe meeting the requirements of either Subsection 914.02 or AASHTO M 86.
2. Metal pipe meeting the requirements of Subsection 915.02.
3. High Density Polyethylene pipe meeting the requirements of Subsection 914.10.
4. PVC pipe meeting the requirements of **Subsection 914.09**

(b) Pipe Culverts(Side Drains) larger than 36 in.(900 mm) shall be one of the following:

(1) Class III, IV, or V Concrete pipe meeting the requirements of **Subsection 914.02**.
(2) Metal pipe meeting the requirements of **Subsection 915.02**.

Where Pipe Culverts (Storm Drains) are specified they shall be in accordance with the following:

(a) Pipe Culverts (Storm Drains) 15 through 36 in. (375 through 900 mm) shall be one of the following:
(1) Class III, IV, or V Concrete pipe meeting the requirements of either **Subsection 914.02** or AASHTO M 86.
(2) High Density Polyethylene pipe meeting the requirements of **Subsection 914.10.**
(3) PVC pipe meeting the requirements of **Subsection 914.09**.

(b) Pipe Culverts (Storm Drains) larger than 36 in. through 48 in. (900 through 1200 mm) shall be one of the following:
   (1) Class III, IV, or V Concrete pipe meeting the requirements of either **Subsection 914.02**.
   (2) High Density Polyethylene pipe meeting the requirements of **Subsection 914.10**.

(c) Pipe Culverts (Storm Drains) larger than 48 in. (1200 mm) shall be Class III, IV, or V Concrete pipe meeting the requirements of **Subsection 914.02**.

Where Slope Drains are specified, they shall be in accordance with one of the following:

(a) Metal pipe meeting the requirements of **Subsection 915.02.**
(b) High Density Polyethylene pipe meeting the requirements of **Subsection 914.10**.
(c) Polyvinyl Chloride pipe meeting the requirements of **Subsection 914.09**.

Materials for special end connections to other pipes or structures, required to complete the work as indicated on the Plans or directed by the Engineer shall conform to the requirements of **Section 914** and **Section 915** of the Standard Specifications, unless otherwise specified.

Reinforced concrete pipe shall be flat base, round, or oval, as shown on the Plans.

The sizes of pipe shall be identified by the nominal inside diameter. The pipe shall be of the sizes and classes or gauges stipulated in the Contract, shown on the Plans, or established by the Engineer.

Steel and aluminum pipe are considered as optional for corrugated metal pipe, pipe arches, and underdrains by the Department. The Contractor may use either option he prefers, however, in no case shall different metals or corrugations be mixed in a single line of pipe.

When paved or coated corrugated metal pipe and pipe arches are specified, either aluminum coating or bituminous coating may be used. The aluminum or bituminous coated pipe shall conform to the requirements of AASHTO M 274 or AASHTO M 190 respectively.

When precoated corrugated metal pipe and pipe arches are specified, polymer coating shall be used in accordance with **Subsection 915.03.** Coupling bands and all hardware except nuts, bolts and washers shall be of the same material and coating as the pipe.

When corrugated metal pipe arches are specified as "size equivalent round" the dimensions shall be as shown in the Plans.

Subsection 607.07-Joining Pipe. Remove and Replace entire subsection with the following:

607.07-Joining Pipe. Rigid pipe may be of bell and spigot or tongue and groove design, unless one type is specified. The method of joining pipe sections shall be such that the ends are fully entered and the inner surfaces are reasonably flush and even.

Joints for rigid pipe shall be made with: (a) portland cement mortar; (b) rubber gaskets; or (c) other types of joints recommended by the pipe manufacturer and approved by the Engineer may be permitted.

For mortar joints, the pipe ends shall be thoroughly cleaned and wetted with water before the joint is made. Stiff mortar shall then be placed in the lower half of the bell or groove of the pipe section already laid and on the upper half of the spigot or tongue of the section to be laid. The 2 pipe sections shall then be tightly joined with their inner surfaces flush and even. The inside of

the joint shall then be finished smooth and any surplus material removed from the pipe. The completed mortar joints shall be protected against rapid drying by suitable covering material.

Rubber ring gaskets shall be installed so as to form a flexible watertight seal. When other type joints are permitted, they shall be installed or constructed in accordance with the recommendations of the manufacturer.

Metal pipe shall be firmly joined by approved coupling bands.

High Density Polyethylene and Polyvinyl Chloride pipe shall meet the performance requirement for soiltightness, unless watertightness is specified. Joints shall be installed so that the connection of pipe sections, for a continuous line, will be free from irregularities in the flow line.

Pipe shall be inspected before any backfill is placed. Any pipe found to be out of alignment, unduly settled, or damaged shall be taken up and relaid or replaced.

Subsection 607.09-Backfilling. Remove and **replace** entire subsection with the following:

607.09-Backfilling. After the pipe is installed, the trench shall be backfilled in accordance with the provisions of Section 204 and the standard drawings. All pipes shall undergo visual inspection during and after installation to insure conformance to these specifications. Final visual inspections for all pipes shall be conducted no sooner than 30 days after completion of installation and final fill. Final visual inspections shall be conducted from the inlet and outlet ends of all pipe with sufficient hand held lighting to observe any defects. In addition to visual inspection, the following test shall be performed not less than 30 days following completion of pipe installation and final fill placement. All post installation inspections and test shall be observed by Department personnel.

High Density Polyethylene Pipe (HDPE Pipe) , Polyvinyl Chloride Pipe (PVC), and Corrugated Metal Pipe (CMP): The contractor shall be responsible for conducting a deflection test, (mandrel, laser, or manual), on at least 10 percent of the total number of pipe runs representing a minimum 10 percent of the total project footage including a minimum of one run of each pipe size. The Engineer shall randomly select installations to be tested to determine whether the internal diameter of the barrel has been reduced more than 5 percent. If any installation is determined to have deflected more than 5 percent, all pipe installations shall be evaluated for deflection. Documentation of station, pipe size, and deflection results shall be provided to the Engineer.

Reinforced Concrete Pipe (RCP): All RCP shall be visually inspected for deflection, alignment, cracking, and joint construction during and after installation. Any installations where visual inspections detect poor construction techniques shall be further evaluated as directed by the Engineer.

All Pipes with deflections greater than 5 percent of the nominal pipe diameter, undue misalignment, or poor joint construction shall be replaced by the Contractor at his expense. Any excavation or additional work including, but not limited to, base stone or asphalt removal and replacement, required to replace a pipe installation due to poor construction techniques shall be at the Contractor's expense. As visual and deflection test dictate, the Engineer may request additional inspections at the contractors expense.

Subsection 607.12-Method of Measurement. Remove and Replace entire subsection with the following:

607.12-Method of Measurement. Concrete pipe culverts and concrete storm sewers of the different classes, shapes, and sizes specified, will be measured by the linear foot(meter) of pipe installed and accepted. The quantity of pipe cut off, not to exceed 2 ft.(600 mm), will be paid for at the contract bid price for pipe in place.

Corrugated metal pipe, and corrugated metal structural plate pipe will be measured by the linear foot (meter) of pipe installed and accepted. Measurements will be made as follows:

(a) Metal pipe and metal structural plate pipe, with square and vertical ends or with skewed and vertical ends will be measured, in place, end to end of the metal on the centerline of the structure.
(b) Metal pipe and metal structural plate pipe, with square ends beveled, and with ends skewed and beveled, except arch pipe, will be measured, in place, by averaging the end to end distances at the top and bottom of the pipe, measured parallel to the centerline of the structure.
(c) Metal arch pipe and metal structural plate arch pipe with square ends beveled, and with ends skewed and beveled, will be measured, in place, end to end of the metal along the invert of the structure.

High Density Polyethylene pipe will be measured by the linear foot(meter) of pipe installed and accepted. The quantity of pipe cut off, not to exceed 2 ft.(600 mm), will be paid for at the contract bid price for pipe in place.

Polyvinyl Chloride pipe will be measured by the linear foot(meter) of pipe installed and accepted. The quantity of pipe cut off, not to exceed 2 ft.(600 mm), will be paid for at the contract bid price for pipe in place.

Slope Drains will be measured in the same manner as specified for corrugated metal pipe.

Pipe Culverts(Side Drains) of the different sizes specified will be measured by the linear foot(meter) along the centerline of the installed pipe, except that no measurement for payment will be made in excess of the ordered length of the pipe. Pipe Culverts (Side Drains) will be ordered in increments of 2 ft.(600 mm).

Unless otherwise indicated on the Plans, no measurement of structure excavation will be made; and the costs involved shall be included in the unit prices bid for other items of construction. When the Plans provide for direct payment for structure excavation, measurement and payment will be in accordance with **Section 204**.

No payment will be made for labor and materials used in making branch connections. The length of pipe in the branch connection will be measured and included in the quantity of pipe installed in the branch line.

Strutting of corrugated metal pipe and corrugated metal structural plate pipe will not be paid for separately, but the costs thereof shall be included in the unit price bid per linear foot(meter) of pipe.

Subsection 607.13-Basis of Payment. **Revise** to include bedding and back fill as shown below:

The accepted quantities of pipe culverts and storm sewers, measured as provided for above, will be paid for at the contract unit price per linear foot(meter) for each type, class, shape, and size constructed, complete in place, including placing and compacting bedding and backfill, which price shall be full compensation for labor and materials used in making joints, and

connections to other structures; for strutting, when required, and for completing all incidentals necessary to complete the item.

Subsection 614.04 First sentence of the second paragraph. Shall read as follows:

The precast concrete deck units shall be cast in a Precast/Prestressed Concrete Institute, Catergory B-3 certified precast plant under plant control conditions, and in accordance with the TDOT procedure for the Manufacture and Acceptance of pre-cast concrete drainage structures, noise wall panels, and retaining wall panels.

The precast concrete deck units shall be cast in a certified precast plant under plant control conditions, and in accordance with the TDOT procedure for the Manufacture and Acceptance of pre-cast concrete drainage structures, noise wall panels, and retaining wall panels.

Subsection 615.01, Replace the second paragraph, first sentence with the following:

"The fabrication of these items shall be accomplished in plants that have been certified by the Precast/Prestressed Concrete Institute, Plant Certified Inspector (PCI)."

Subsection 615.02, Replace the third paragraph, first sentence with the following:

"The fabrication of precast/prestressed concrete members shall be in a Precast/Prestressed Concrete Institute category B-3 certified plant and have at each fabrication site a technician skilled in the approved pre-stressing method."

Subsection 615.05, Replace the second paragraph with the following:

"The panels shall be fabricated in a plant certified by the Precast/Prestressed Concrete Institute (PCI) category B-3."

Subsection 615.07 First paragraph, fourth sentence, **Change** "4 months" to "6 months"

Subsection 616.05 Revise the last paragraph to the following:

"Tendons shall be placed in rigid ducts after concrete placement is completed. Ducts shall be as specified on plans and in conformance with Subsection 616.07."

Subsection 619.14 Add as the second paragraph

PMC Variable Depth shall be measured by the cubic yard complete in place. The number of cubic yards will be determined by deducting the theoretical volume of Bridge Deck Overlay (PMC) from the total volume of PMC required to obtain the finished grade shown on the Plans or established by the Engineer.

Subsection 621.01 Add "and temporary shoring" after "temporary structures" in the first sentence.

Subsection 621.02 Add the following as the last paragraph:

Temporary shoring shall be used to retain the earth during grading operations and bridge construction to maintain traffic. Temporary shoring shall be installed at the locations shown on the plans or as directed by the engineer. Payment for this item will not be made when used for the installation of drainage structures, utilities, to meet OSHA regulations, or for the convenience of the contractor, unless these locations are specifically shown on the plans. The contractor shall design the temporary shoring for the specific locations and in-situ soil types. The submittal shall be in accordance with **Subsection 105.02**, shall be stamped by a Professional Engineer, and shall include detailed drawings, design calculations, and shoring material requirements. Temporary shoring may be sheet piling, piling/lagging walls, tie back walls, etc…

Subsection 621.03 Add the following as the last paragraph:

Temporary shoring will be measured and paid for by the square foot (square meter) of exposed vertical face area. The bottom of shoring for payment will be where the exposed face intersects the existing or specified grade. The top of shoring for payment will be the actual shoring top, but not more than one (1) foot above where the back of shoring intersects the existing or specified grade.

Subsection 621.04 Add the following as the last paragraph:

Payment for temporary shoring shall be full compensation for all designs, submittals, labor, tools, equipment, materials, and all other incidentals for proper installation and removal of the shoring.

Subsection 623.02 B. 2. First sentence, **Add** after "grade 50" "50S, HPS50W,"

Subsection 623.02 C. 2. Last part of the paragraph, **Add** after "Category I" "Simple Steel Bridges", SBR-1B.

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

(Rev. 02-06-10) March 1, 2006
(Rev. 05-05-10)
(Rev. 12-13-10)
(Rev. 06-12-13)

Supplemental Specifications - Section 700

of the

Standard Specifications for Road and Bridge Construction

701.13-Method of Measurement. Add the following as the second paragraph:

Handicap Ramps will be measured by the ft.² (m²) complete in place as specified by standard drawings. The area shall be obtained by surface measurements. Where standard widths are constructed, the measurements shall not exceed the standard widths shown on the Plans, unless approved in writing by the Engineer.

Subsection 701.14-Basis of Payment. Revise paragraph to include Handicap ramps as follows:

The accepted quantities of Concrete Sidewalk of each thickness, Handicap Ramps, and Concrete Driveway will be paid for at the contract unit price per ft.² (m^2) for the respective items, complete in place. The accepted quantities of Concrete Median Pavement will be paid for at the contract unit price per yd³. (m^3), complete in place.

Subsection 705.06: Delete the second and third paragraph, and add the following as the second, third, and fourth paragraph. Revise the bulleted section as shown below.

All post holes, dug or drilled, shall be of such size as will permit proper setting of the posts, and allow sufficient room for backfilling and tamping.

When solid rock is encountered while drilling post holes.

- Within 18 in. (460mm) of the ground surface, an oversized or elongated hole shall be drilled 24 in. (610mm) into the rock. The post shall be set at the roadside edge of the hole and the hole should be backfilled with the cutting spoils. If using wooden posts the oversized hole shall be a single hole 23 in. (580mm) in diameter or three overlapping holes 10 in. (250mm) in diameter to a length of 23 inches. For steel posts, the oversized hole shall be a single hole, 20 in. (530mm) in diameter or three overlapping holes 8 in. (203mm) in diameter to a length of 20 inches.
- Below 18 in. (460mm) of the ground surface hole shall be drilled 12 in. (300mm) into the rock or to the specified depth in Plans. The holes shall be 8 in. diameter for steel posts, and 12 in. diameter for wood posts.

- When installing end terminals using tubes, posts 1 and 2 will be installed to full depth or a minimum of 36 in. into the solid rock. The holes around the steel tube shall be backfilled with the cutting spoils.
- See approved shop drawings for additional information concerning post depth, and size of holes.

To validate proper installation of posts, each guardrail contractor/installer doing work for the Department shall have a minimum of 5 line posts and 5 terminal posts per Region per year pulled by the Department for verification of length. The Regional Construction and Materials and Tests offices may select any post for verification, but at a minimum, must select posts from five different runs of rail. If the posts are found to be in accordance with the plans and specifications, they may be re-installed if they were not damaged during the pulling process. If the post length is found to be deficient, the contractor/installer shall be required to remove the entire run of guardrail or end terminal and replace it properly at his expense.

Subsection 705.10: Add to the end of the section

When no contract unit price has been established for drilling or boring in solid rock, for posts, while placing Single Guardrail, payment for each hole shall be made at a rate equal to 2.0 times the contract unit price for Single Guardrail.

While drilling or boring into solid rock for posts placed in conjunction with Guardrail at Bridge Ends, Parapets, Piers, Concrete Endposts, and other similar edifice, payment shall be made at a rate equal to 1.25 times the contract unit price per hole.

When no unit price has been established for drilling or boring into solid rock for End Terminals posts, payment shall be made at a rate equal to 2.0 times the contract unit price for single guardrail per hole.

Unless posts are driven to refusal in solid rock, prior to drilling or boring, no additional payment will be made for drilling or boring for the placement of posts.

Subsection 709.01, Revise entire subsection to the following:

709.01-Description. Riprap shall consist of furnishing and setting or placing, rubble stones, crushed stone, sacked sand-cement, machined riprap, and embedded riprap. Slope Pavement shall consist of the construction of a reinforced concrete mat on prepared slopes. The riprap and slope pavement shall be constructed within reasonably close conformity to the lines, grades, and cross sections, and at the locations indicated on the Plans or as directed by the Engineer, and in conformity with the requirements and provisions of these Specifications.

Subsection 709.02, Revise entire subsection to the following:

709.02-Materials. Materials used in the construction of riprap and slope pavement, in addition to meeting the general requirements of these Specifications, shall conform to the following:

(a) Rubble-stone Riprap shall consist of stone or broken Class "A" or paving concrete meeting the requirements of **Subsection 918.10**. In addition, at least 80% of the stone shall have a minimum dimension of 10 in.(250 mm). The remainder shall be 2 to 4 in.(50 to 100 mm), and shall be approximately rectangular and/or trapezoidal in shape. Broken Class "A" or paving concrete shall be free of steel and wire fabric reinforcement. Sand

for rubble-stone riprap(grouted) shall meet the requirements of **Subsection 903.01** or **903.02**. Cement for rubble-stone riprap(grouted) shall meet the requirements of **Subsection 901.01**.

((b)Sand for sacked sand-cement riprap shall be manufactured or natural sand and shall meet the quality requirements of **Subsection 903.01** or **903.02**. Cement for sacked sand-cement shall meet the requirements of **Subsection 901.01**. Sacks shall be of either cotton or jute, standard grade of cloth, which will hold the sand-cement mixture without leakage during handling and tamping. They shall be strong and shall be sized to hold approximately 1 c.f.(0.03 mm^3).

(c) Reinforced concrete slope pavement shall be composed of Class A concrete meeting the requirements of **Subsection 604.03** and steel reinforcement meeting the requirements of **Subsection 907.01** or **907.03**, whichever is specified. Preformed expansion joint filler shall meet the requirements of **Subsection 905.01**.

(d) Concrete curing materials shall meet the requirements of Sec**tion 913**.

(e) Machined Riprap shall be clean shot rock essentially free of sand, dust or organic materials and shall be the size designated for the class specified. The stone shall be uniformly distributed throughout the size range. The thickness of the stone layer shall be that designated for the specified class herein unless otherwise noted on the Plans. Sensitive areas of the project as indicated on project plans, project permits, and/or designated by the Engineer requiring washed and/or clean rock will be provide by the contractor at no additional cost to the project. Washed and/or clean rock must be approved by Engineer prior to placement in environmentally sensitive areas.

When rock or stone is used as riprap, the material when subjected to five alternations of the sodium sulfate soundness test (**AASHTO T 104**), shall not have a weighted percentage of loss of more than 12. The material shall be approved by the Engineer before use.

Subsection 709.08: Second paragraph, **Change** "sawed for a depth of 1 ft." to "1 in."

Subsection 709.09, Revise entire subsection to the following:

709.09-Machined Riprap. The Contractor shall exercise care in the preparation of the riprap subgrade to insure that no reduction in the design waterway occurs. No riprap is to be placed until the final subgrade elevation has been verified by the Engineer. When deemed necessary by the Engineer, the riprap shall be rolled down with metal tracked equipment to provide a more dense stone mass with final contours in reasonable conformance to the plans. Placement of the super-structure shall not proceed until the final elevation of the riprap has been accepted by the Engineer.

Upon completion of the work, visual inspection shall reveal that approximately 50% of the surface area consists of stones no smaller than 1/2 of the maximum size specified.

The material shall be dumped and placed by the use of appropriate power equipment in a manner that will produce a surface uniform in appearance. Hand work may be required to correct irregularities.

The Contractor shall exercise care in the preparation of the site referring to erosion control in accordance with the provisions in Subsection 209 and channel excavation in accordance with the provision of Subsections 203.02(c). When required by project plans, permits, or as directed by

the engineer, embedded riprap in streams, conveyances, diversions, or other sensitive areas shall be properly tamped into the subsurface or otherwise blended into the substrate. Care is to be taken so that water flows over the embedded riprap and that flow is not lost below and/or within the rock. If clean rock is required by the project plans, permit, or directed by the engineer, the rock shall meet the provisions of Subsection 709.02 for clean rock.

Subsection 712.01: Add to the end of paragraph 1.

This work shall include both installing additional devices as necessary in construction work zones.

Subsection 712.04: Remove entire subsection text and replace with the following:

General. At the Pre-construction Conference the Contractor shall designate a responsible person who will be assigned to the project to supervise traffic control.

Signs shall be erected in a workmanlike manner such that all supports are plumb, sign panels generally perpendicular to the travelway and legends horizontal so that they effectively convey the intended message. Advanced warning signs shall not be displayed more than 48 hours before physical construction begins. Signs may be erected up to 1 week before needed, if the sign face is fully covered, in a manner approved by the Engineer. The sheeting of the sign shall be free of any damage that would reduce the reflectivity. The use of overlay plates on signs is prohibited. Signs shall be mounted on stationary or portable supports dependent on the type work being performed. Sign supports shall be driven a minimum of 3.5 ft. (1 m) into soil or 1 ft. (300 mm) into solid rock. Where soil and solid rock are both encountered, the depth of the sign support in the ground shall be:

$d1 + 3.33d2 = 1$, where
$(d1 + 3.5d2 = 42)$
$d1$ = depth in m (in.) of support in soil
$d2$ = depth in m (in.) of support in solid rock

Stationary sign supports may be spliced, provided the splice is a minimum of 18 in.(450 mm). In addition, the stubs for the splice shall be driven as required above and shall not extend above 18 in.(450 mm) from ground level. The splice shall be fastened with four bolts, 2 placed at each end of the splice. In general, work being performed at spot locations and of short duration will necessitate the use of portable supports properly weighted for stability.

During periods of non-use, warning signs and other devices shall be removed from the work area, covered or otherwise positioned so they do not convey their message to the traveling public and do not present a safety hazard to drivers. If covered, the covering material shall be maintained in a neat and workmanlike manner during its use. The method of covering the sign face shall not deface or damage the sheeting of the sign.

Barricades and other devices that require lighting shall be lighted, as designated by plans details or as directed by the Engineer, with the use of flashing or steady burning lights. The Contractor will be responsible for procuring and bearing the expense of a continuous power source.

Flaggers with proper attire and paddle shall be provided when necessary to safely handle traffic through the construction zone. Flaggers shall be trained and certified in flagging operations by one of the following training programs:

1) American Traffic Safety Services Association (ATSSA)
2) National Safety Council (NSC)
3) Tennessee Transportation Assistance Program (TTAP)
4) Construction industry associations, consultant organizations, and contractor developed flagger training programs will be acceptable if they have an established, written program which meets all *Manual on Uniform Traffic Control Devices* (MUTCD) requirements and Department Policy.

Flaggers will be considered a general requirement of traffic control and no direct payment will be made for such.

When requested by the Project Engineer or the Contractor and approved by the Regional Safety Coordinator or Regional Operations Office, a Tennessee Highway Patrol (THP) Trooper may be provided to enforce motor vehicle laws and otherwise assist in securing the public safety. Requests to provide the THP should be received at least forty-eight (48) hours in advance of the requested time of service. If the THP is scheduled to work and the work is canceled, or the schedule is changed, the contractor is responsible for notifying the THP and the Project Engineer at least two (2) hours prior to the scheduled time of work.

When a THP Trooper is not available, the contractor may provide a Uniformed Police Officer if approved by the Project Engineer and the Regional Safety Coordinator or Regional Operations Office. The Uniformed Police Officer shall maintain a detailed written log of his enforcement activities and shall submit the log to the Engineer for verification each month.

All Uniformed Law Enforcement Officers working on TDOT projects shall have training from a Peace Officer Standards and Training (POST) certified police training academy in the State of Tennessee and an additional 4 hours of FHWA approved work zone training. Record of this training shall be submitted to the Project Engineer.

The Flashing Arrow Board(s) shall be installed at locations shown on the Plans or as directed by the Engineer and shall comply with all requirements of the **"Manual on Uniform Traffic Control Devices for Highways and Streets"(MUTCD)**. The Contractor shall take all necessary precautions to insure that the Flashing Arrow Board(s) perform as described herein. Any Flashing Arrow Board that exhibits any type of malfunction including improper dimming shall be corrected or replaced immediately.

The Flashing Arrow Board shall be capable of displaying the following configurations:

1. Right Arrow - 10 lamps flashing in unison forming an arrow
2. Left Arrow - 10 lamps flashing in unison forming an arrow
3. Double Arrow - 5 lamps in each arrow head and 3 lamps in a common shaft all flashing in unison
4. Four Point Caution - 4 outermost corner lamps flashing in unison

The Flashing Arrow Board(s) shall be used in the single arrow mode for lane closure only and shall be situated and aligned so that the flashing arrow is clearly visible and legible. The

single arrow mode display shall have 10 lamps flashing in unison. The sequential arrow configuration, chevron arrow configuration, and horizontal bar configuration will not be allowed. The flash rate shall not be less than 25 flashes per minute or more than 40 flashes per minute. Minimum lamp "on-time" shall be 50% of the cycle.

The Flashing Arrow Board(s) shall be mounted so as to provide a minimum of 7 ft.(2.1 m) between the bottom of the panel and the roadway.

Portable signs may be used when the duration of the work is less than three (3) days or as allowed by other conditions in the proposal. All portable signs and sign mounting devices utilized in work shall be **NCHRP 350** compliant. When not being used, portable signs must be removed from the clear zone. Turning signs sideways or backwards is explicitly prohibited while the signs are in the clear zone. Portable interim signs shall be mounted a minimum of one (1) foot above the level of the pavement edge and shall be mounted at the height recommended by the manufacturer's crashworthy testing requirements.

All regulatory sign blanks shall be rigid.

The Contractor shall make every effort to eliminate the use of interim signs as soon as the Work allows for the installation of permanent signs.

Existing street name signs shall be maintained at street intersections.

Any sign(s) or portions of a sign(s) that are not applicable to the traffic control plan shall be covered so as not to be visible to traffic or shall be removed from the roadway when not in use.

The Contractor shall not remove any existing signs and supports without prior approval from the Engineer. All existing signs and supports that are to be removed shall be stored and protected if this material will be required later in the work.

Interim guide, warning, or regulatory signs required to direct traffic shall be furnished, installed, reused, and maintained by the Contractor in accordance with the **MUTCD**. The bottom of all interim signs shall be mounted at least seven (7 ft.) feet above the level of the pavement edge when the signs are used for long-term stationary operations as defined by Section 6G.02 of the **MUTCD**.

Existing guide and exit directional signs on the Project shall be maintained until conditions require a change in location or legend content. When change is required, the signs shall be in accordance with the Traffic Control Plan. When an existing guide and exit directional signs sign is in conflict with work to be performed, the Contractor shall remove the conflicting sign and reset it in a new, non-conflicting location that has been approved by the engineer.

When it is not possible to utilize existing signs, either in place or relocated, the Contractor shall furnish, erect, maintain, modify, relocate, and remove new interim guide and exit directional signs in accordance with the Plans or as directed by the engineer.

The installation of new permanent guide and exit directional signs and the permanent modification or resetting of existing guide and exit directional signs, when included in the contract, shall be accomplished as soon as practical to minimize the use of interim guide and exit directional signs.

Worker Visibility and Safety. All workers within the right-of-way of a project who are exposed to either vehicular traffic or to construction equipment in the work area shall wear high-visibility safety apparel. High-visibility apparel shall be considered personal protective clothing that meets performance Class 2 or Class 3 of the ANSI/ISEA 107-2004 publication. Class 3 apparel shall be required for night work.

Portable Barrier Rail. All portable barrier rail will be placed as far away from the travel lanes as possible while serving the intended purpose. All portable barrier rail will be moved or removed as directed by the engineer. There shall be no additional payment for removing barrier that is no longer required.

Lane Closures. The length of a lane closure should be held to the minimum length required to accomplish the Work. The advanced warning signs for the project should not overlap with the advanced warning signs for lane shifts, lane closures, etc.

Drums shall be used in all transition tapers for lane closures on multi-lane roads

Night Work Lighting. When night work is required by Contract documents or plans, the Contractor shall supply sufficient lighting according to the following Specification.

The following information regarding the lighting plan must be submitted to the project supervisor:

- Descriptions and sketches of the layout of lighting devices including spacing, luminary height, lateral placement and anticipated illuminance provided.
- Photometric & physical specifications of all lighting equipment.
- Detailed description of all lighting to be used on construction equipment.
- Methods to be employed to reduce glare.
- Contractor's frequency and procedure for checking illumination levels.

In addition to their standard protective equipment, the following information regarding construction personnel and equipment shall be followed as a minimum:

1. Traffic Control Persons, all equipment operators and all other workers shall wear high-visibility apparel that meets performance Class 2 or Class 3 of the ANSI/ISEA 107-2004 publication. Class 3 apparel shall be required for night work.
2. They shall also have a minimum of 12 in^2 of reflective material added to their hard hats which is visible from all sides.
3. Traffic Control Persons must also be equipped with a flashlight complete with semi -transparent red cone.
4. All traffic control persons shall be equipped with radios or cell phones so that they have communication with each other.
5. All workers shall receive specific training on night work operations.
6. All vehicles in the work area must operate rotating or flashing incandescent amber lights visible in 360 degrees around the vehicle.
7. All work vehicles including trucks must have red and white reflective tape applied to all sides such that it defines the outline of the vehicle.

The following equipment will be outfitted with non glare balloon style lights or equivalent. The lights will be required on each piece of equipment in operation.

Equipment Type	**Illuminance Requirement**
Paver, Milling Machine, Material Transfer Devices	1- 4000 watt assembly or 2 - 2000 watts assemblies
Grader, Roller, Rumble Strip	1 – 400 watt assembly

Machine, Shoulder Machine	
Paint truck	1- 400 watt assembly or nonglare 300 watt floodlight assembly
Guardrail driver, stationary Operation	1- 4000 watt assembly or 2 - 2000 watts assemblies or equipment light plant
Trail Vehicle	1-4000 watt assembly or 2 - 2000 watts assemblies

(A trail vehicle will be required to follow the last piece of equipment in a mobile operation(i.e. finish roller, pavement marking, etc.) depicting the beginning of the working area. In addition, portable lighting of at least 400 watts shall be available for the density testing inspector. The illuminance requirement for other vehicles not listed will be determined by the Engineer. A 400 watt metal halide lamp or equal approved by the Engineer may be substituted for a 2000 or 400 watt balloon light assembly.)

All luminaries shall be located and directed in such a way to minimize glare to both motorists and work vehicles. If glare is noted from any travel path, the contractor must adjust the lighting to reduce the glare to an acceptable level to the satisfaction of the Engineer.

The contractor shall replace non-functioning lamps immediately. The luminary aiming shall be checked daily. The luminaries shall be cleaned regularly.

Specification Compliance. The Contractor will be notified for failure to comply with this specification or plans. The safe passage of pedestrians and traffic through and around the temporary traffic control zone, while minimizing confusion and disruption to traffic flow, shall have priority over all other Contractor activities. Continued failure of the Contractor to comply with the requirements of the Traffic Control Standard Specification or Special Provisions will result in non-refundable deductions of monies from the Contract for non-performance of Work that the deficiency is allowed to remain, not as penalty, but as liquidated damages.

Failure of the Contractor to comply with this Specification or take immediate correction actions required within forty-eight (48) hours of written notice shall be reason for the engineer suspending all other work on the Project, except erosion prevention and sediment control and traffic control, applying non-refundable deductions of monies from the Contract at a rate of twenty-five hundred dollars ($2,500) per calendar day per notice and/or withholding payment of monies due to the Contractor for any work on the Project until traffic control deficiencies are corrected. These other actions shall be in addition to the deductions for non-performance of traffic control.

Subsection 712.05: Remove entire subsection text and replace with the following:

Pavement Marking Removal. Conflicting pavement markings must be removed to prevent confusion to vehicle operators. Pavement marking removal shall be accomplished by the Contractor in a manner acceptable to the Engineer.

Final surface pavement markings shall be removed by sand blasting, water blasting, or acceptable grinding methods that will cause the least possible damage to the pavement. Intermediate surface pavement markings shall be removed by sand blasting or water blasting, or other approved methods that will cause the least possible damage to the pavement. The following methods listed below are considered as acceptable for intermediate surface pavement

markings: Sand blasting using air or water, High pressure water, steam or superheated water, or Mechanical devices such as grinders, sanders, scrapers, scarifiers, and wire brushes.

The Contractor at his expense shall repair any damage to the pavement or surface caused by pavement marking removal by methods and materials acceptable to the engineer. The end result of the removal shall not cause a condition that appears to be a line that conflicts with the current markings.

Traffic shifts that are done on the final surface shall be accomplished using interim traffic marking tape unless otherwise specified in the plans.

Removal of an existing pavement marking by painting over with black paint or asphalt will not be an acceptable method.

When the method of removal causes sand or other material to be accumulated on the pavement, the residue shall be removed as the work progresses.

Subsection 712-07 Maintenance. Revise entire subsection to the following**:**

712.07-Maintenance. The Contractor shall assume full responsibility for the continuous and expeditious maintenance of all signs, barricades, temporary impact attenuators and all other traffic control devices to meet the "acceptable" category as described in *Quality Guidelines for Temporary Traffic control Devices and Features* published by ATSSA. Such maintenance will be considered a part of the original installation cost. Failure to maintain all traffic control devices in such a manner as to provide continuous safety to the public will be cause for suspension of construction operations until proper traffic control is re-established.

Subsection 712.09: Revise the entire subsection to the following:

712.09-Method of Measurement. Signs, including Vertical Panels, erected on suitable supports will be measured by the actual square foot(square meter) installed. No deduction will be made for corner radii.

Drums for channelizing traffic will be measured per each. This number shall be determined by counting the maximum number of drums on a job site and in use at any one time. If a construction project is being stage constructed, the number will be counted for each construction phase and summed up for a grand total for the project.

Barricades will be measured by the linear foot(meter) for the type designated.

Delineators and Temporary Flexible Tubular Delineators will be measured per each.

Warning Lights and Flashing Arrow Boards will be measured per each for the type designated.

Portable Barrier Rail will be measured by the linear foot(meter). Separate measurement will be made for the initial installation of portable barrier rail at each site that the rail is used on the project as indicated on the plans or approved by the Engineer. No separate measurement will be made for removing and resetting portable barrier rail on new alignment at the same site to provide for changes in traffic control required by the different phases of construction. The following conditions apply to measurements of portable barrier rail:

1) The sites on 1 directional roadway of a divided highway will be considered independently of the sites on the other directional roadway and

2) Each bridge for which portable barrier rail is indicated on the plans or approved by the Engineer will be a separate site.
3) Additional relocations of barrier rail that will be relocated due to safety of work zone or traffic, as established in the traffic control plans or as directed by the engineer laterally up to 10 ft., shall be paid at ten percent (10%) of the interconnected portable barrier bid amount unless a separate item is in the proposal.

Measurement of Portable Impact Attenuators will be based on the initial installation of each portable impact attenuator. No additional payment will be made for removal, moving and reinstalling impact attenuators at other locations on the project as directed by the Engineer. Payment will be based on the maximum number of portable impact attenuators in place at one time.

Temporary pavement marking line will be measured as described for Painted Pavement Marking Line in **Subsection 716.07** regardless of whether the lines are painted, taped markings or raised pavement markers or a combination of the above as shown on the plans or as required by the Engineer except that Removable Pavement Marking(Line) which will be measured by the linear foot(meter) of installed line.

Unless otherwise specified, no individual measurement will be made of traffic cones, removal of pavement marking or flaggers, as these items will be included in the lump sum item Traffic Control.

THPs shall be compensated by the Department but the contractor will be responsible for notifying the THP and the Project Engineer when work has been canceled within two (2) hours of the schedule of work. When the THP is not notified of work cancellation and the THP elects to monitor/patrol the project for a maximum of two (2) hours, a deduction will be made to monies owed the contractor equaling the THP pay rate for two (2) hours of work.

Uniformed Police Officers shall be provided by the contractor and compensation made by the Department for the invoice price of the work plus 5% not to exceed $50 per hour for the hours present on the project. No compensation will be made for drive time.

Subsection 712.10: Revise the entire subsection to the following:

712.10-Basis of Payment. The lump sum payment for Traffic Control shall include Temporary Workzone Lighting and all equipment, labor, materials and shall included full compensation for furnishing flaggers, traffic cones and removing conflicting and incorrect pavement markings, as required, until project completion.

Payment for Portable Barrier Rail will be by the linear foot (meter) at the contract bid price which shall be full compensation for all materials, installation, maintenance and all incidentals of the work.

Payment for Portable Energy Absorbing Terminals will be made at the contract price per Portable Energy Absorbing terminal, complete in place, with total payment based on the maximum number of portable energy absorbing terminals in place at one time as specified in **Subsection 712.09**.

Payment for Portable Impact Attenuators will be made at the contract price per Portable Impact Attenuator, complete in place, with total payment based on the maximum number of portable impact attenuators in place at one time as specified in **Subsection 712.09.**

Payment for Signs and Vertical Panels measured per square foot(square meter) shall be full compensation for sign panels with proper sheeting and legend, erecting on proper supports, furnishing all mounting hardware, covering when not in use, relocating, handling and maintaining until project completion.

Payment for Flexible Drums shall be measured per each, for the highest number that is IN USE on the project at one time. This shall be designated by making a notation such as "On October 29, 2004, there were 242 Flexible Drums in use. Pay quantity is 242 Each."

This will not apply to phase construction projects. On phase construction projects, each phase would need to be treated as a separate project to arrive at a final pay quantity. The highest number used on Phase I, plus the highest number used on subsequent phases, shall constitute the final pay quantity.

Payment for Barricades measured by the linear foot(meter) complete in place, shall be full compensation for materials, equipment, relocating, handling, maintaining, and all incidentals of the work.

Unless otherwise designated, all signs, barricades, and other traffic control devices covered by this section shall become the property of the Contractor at the completion of the project. The salvage value for these items shall be reflected in the contract unit price bid.

Ten ft.(3 m) lane line/center line and solid barrier line will be paid for as Painted Pavement Marking(Line) in accordance with **Subsection 716.08.**

Payment for Removable Pavement Marking Line,(8 in.(200 mm)) Barrier Line, Channelization Striping or Stop Line, shall include installation, maintenance and removal of the marking line when it is no longer required.

Payment for Uniformed Police Officers shall be full compensation for providing the Officer, official law enforcement vehicle, all necessary equipment, and administrative costs associated therewith.

Subsection 714.02 Revise entire subsection to the following:

714.02-Materials and Submittal Data Requirements. Materials used in this construction shall conform to the requirements of **Section 917** and to the following Sections or Subsections, unless otherwise stipulated:

Material	**Section or Subsection**
Gray Iron Castings	**908.07**
Portland Cement Concrete, Class	**604**
Steel Bar Reinforcement for Concrete Structures	**907.01**
Welded Steel Wire Fabric	**907.03**
Crushed Stone Grading D	**903.05**
Cement Concrete Curing Materials	**913**
Aluminum Paint	**910.04**
Conduit	**917.05 or 917.07**

Within 30 days after the issuance of the work order, the Contractor shall submit to the Engineer, four (4) collated sets of the manufacturer's descriptive literature and technical data which fully describes the types of lighting equipment he proposes to use. Descriptive literature shall include the manufacturer, models, etc. and be adequate to determine if the equipment or material meets the requirements of the Plans and these specifications. These sets of submittal

data shall include a list of the materials submitted along with descriptive material for, but not limited to, the following items when applicable:

1. Complete photometric data of luminaires as published by the manufacturer with independent testing laboratory results.
2. Computer printouts showing illumination levels throughout each interchange area where high mast luminaires are to be installed.
3. General details of light standards, breakaway bases and bracket arms.
4. Highmast tower details with a set of design computation for each height including access hole, base, anchorage, head frame, and lowering device. Details are to include specification references for materials and location, type, size and extent of welds.
5. Dimension sheets and performance data on all related equipment.

The Engineer shall retain one copy and forward one copy to the Regional Materials and Test Division, one copy to the local entity (city or county engineer), and one copy to the Design Division for their review.

The submittal sets shall also include detailed scale drawings of any non-standard or special equipment and of any proposed deviation from the Plans. Any deviation from plans or specifications shall require approval from the Design Division. A letter requesting deviations or alternate materials must be included in the submittal for Design Devision approval. If requested to do so, the Contractor shall submit for approval sample articles of any materials proposed for use. The Department will not be liable for any materials purchased, labor performed, or delay to the work prior to such approval.

In addition to the above, each submittal shall include a notarized letter certifying that all lighting system materials listed in the submittal are in conformance with the Plans and Specifications. The Contractor shall also submit to the Engineer a statement from the Maintaining Agency that the system is acceptable to the Agency.

Subsection 716.02 Delete "Adhesive 918.26" from the table.

Subsection 716.03 Revise entire subsection to the following:

716.03-Thermoplastic Pavement Marking.

(a) General.

The material shall be applied to the pavement by the screed extrusion method or the ribbon dispenser method. The screed extrusion device shall have one side of the shaping die open with the other 3 sides being contained by, or being part of, suitable equipment for heating and controlling the flow of material. Ribbon dispensers shall be heated, suspended above the road surface, and shall apply the material to the width and thickness specified.

The equipment shall be constructed to provide continuous mixing and agitation of the material. Conveying parts of the equipment between the main material reservoir and the shaping die shall be so constructed as to prevent accumulation and clogging. All parts of the equipment which come in contact with the material shall be so constructed as to be easily accessible for cleaning and maintenance. The equipment shall be constructed so that all mixing and conveying parts up to and including the shaping die, maintain the material at the plastic temperature with heat transfer oil or electrical element controlled heat. Direct fire heat transfer will not be allowed.

The equipment shall be so constructed as to insure continuous uniformity in the dimensions of the stripe. The applicator shall provide a method of applying "skip" lines. The use of pans, aprons, or similar appliances which the die overruns will not be permitted under this Specification. The equipment shall be calibrated, and checked periodically by marking over a metal plate. The equipment will be so constructed as to provide for varying widths to produce varying widths of traffic markings.

Glass spheres applied to the surface of the completed stripe shall be applied by an automatic bead dispenser attached to the striping machine in such a manner that the beads are dispensed almost instantaneously upon the installed line. The glass sphere dispenser shall be capable of applying glass spheres to the surface of the completed stripe by a double drop application for initial traffic striping and marking. The bead dispenser for the first bead drop shall be attached to the striping machine in such a manner that the beads are dispensed closely behind with the thermoplastic material. The second bead dispenser bead shall be attached to the striping machine in such a manner that the beads are dispensed immediately after the first bead drop application. Glass spheres dispensers shall be equipped with an automatic cut-off control that is synchronized with the cut-off of the thermoplastic material and applies the glass spheres in a manner such that the spheres appear uniform on the entire traffic stripes and markings surface with, 50 to 60% embedment.

Special kettle(s) shall be provided for melting and heating the thermoplastic material. The kettle(s) must be equipped with automatic thermostatic control devices so that heating can be done by controlled heat transfer rather than by direct flame, so as to provide positive temperature control and prevent over-heating of the material.

Applicators shall be mobile and maneuverable to the extent the straight line can be followed and normal curves can be made in a true arc.

The applicator equipment to be used on roadway installations shall consist of either hand equipment or truck mounted units depending on the type of marking required.

The hand equipment shall have sufficient capacity to hold 150 lbs (70 kgs) of molten material and shall be sufficiently maneuverable to install crosswalks, lane, edge, and center lines, arrows and legends. The truck mounted unit for lane, edge and center lines shall consist of a mobile self contained unit carrying its own material capable of operating at a minimum speed of 5 mph (8 kph) continuously during an 8 hour period while installing striping.

Hand equipment used for stop bars, cross walks, legends, directional arrows and other specialty markings shall use the same thermoplastic formulation as described above with the exception of placing the marking at a minimum thickness of 0.090 in. (3mm) and a single drop of AASHTO M-247-09, Type 1 bead at the rate of 8 to 10 pounds per 100 square feet {3.6 to 4.5 kg per 9.3 m2} of stripe.

As an alternate, the Contractor may apply preformed thermoplastic marking material for stop bars, cross walks, legends or directional arrows. The preformed thermoplastic material shall have a minimum thickness of 0.090 in. (3 mm) and fused to the pavement by the heat of a torch.

(b) Application.

The pavement temperature shall be a minimum of 50° F (10° C) and rising before application begins. Application shall be suspended at any time the pavement temperature

falls below 50° F (10° C). All surfaces to be marked shall be thoroughly cleaned of all dust, dirt, grease, oil and all other foreign matter before application of the striping.

To insure optimum adhesion of thermoplastic applied on all Portland cement concrete pavements, the Contractor shall apply a binder-sealer material as recommended by the thermoplastic manufacturer. To insure optimum adhesion, the thermoplastic material shall be installed in a melted state at a temperature of 400 to 450° F (205 to 230° C). The material, when formed into traffic stripes, must be readily renewable by placing an overlay of new material directly over an old line of compatible material. Such new material shall bond itself to the old line in such a manner that no splitting or separation takes place.

Longitudinal lines shall be off-set at least 2 in. (50 mm) from longitudinal joints of Portland Cement Concrete pavements.

Unless specified on the plans, a minimum average film thickness of 0.100 in. (2.54 mm) for lane and edge lines shall be maintained on all markings. This is to be computed on the basis of the amount of material used each day. The film thickness shall be uniform in appearance throughout its application. The glass sphere top coating must be applied by means of a pressure type spray gun designed specifically for this purpose, and which will embed the spheres into the line surface to at least one-half their diameter.

Placement of Drop on Glass Beads AASHTO M-247-09, Type 1 and AASHTO M-247-09, Type 4 shall each be placed on the thermoplastic stripe at a rate of 8 to 10 pounds per 100 square feet {3.6 to 4.5 kg per 9.3 m2} of stripe.

The AASHTO M-247-09, Type 4 glass beads shall be placed immediately after the first bead drop application of AASHTO M-247-09, Type 1 beads.

"Regardless of the application methods and procedures, or pavement types, the Contractor will be responsible for replacing any and all pavement markings that fail to comply with these specifications or fail to adhere to the pavement for one year after installation at the Contractor's own expense."

Contractor's Responsibility for Notification.

Notify the Engineer prior to the placement of the thermoplastic materials. Furnish the Engineer with the manufacturer's name and batch numbers of the thermoplastic materials and glass spheres to be used. Ensure that the approved batch numbers appear on the thermoplastic materials and glass spheres packages.

When thermoplastic is used on the final surface, the Contractor shall have the option of using reflectorized paint installed to permanent standards at the end of each day's work and then installing the permanent marking after the paving operation is completed. Short, unmarked sections will not be allowed.

Protection of Newly Applied Traffic Stripes and Markings.

Do not allow traffic onto or permit vehicles to cross newly applied pavement markings until they are sufficiently dry. Remove and replace any portion of the pavement markings damaged by passing traffic or from any other cause, at no additional cost to the Department.

Subsection 716.04 Replace the first paragraph with the following:

716.04-Raised Reflective Pavement Markers. Markers shall be bonded to the pavement with an epoxy listed on the Departments QPL and approved by the marker manufacturer or a hot bituminous adhesive conforming to the requirements as described below. Markers manufactured with a self adhesive backing will not be allowed. Markers shall be spaced as shown on the plans but shall not be installed over joints in rigid type pavements.

Subsection 716.06: Replace with the following

The application of preformed plastic pavement markings shall be made on clean dry surfaces free of dirt and foreign matter. The pavement temperature shall be 60° F (15° C) or over. Should plastic require activators for the adhesive or various special coatings for different pavement surfaces, the bidder shall include the cost of the activator or special coatings in the unit price of plastic bid upon.

The vendor will furnish with each package of reflectorized pavement marking materials complete instructions and/or specifications for the application of pavement marking materials to pavement surface. The reflectorized pavement marking materials are to be installed according to the vendor's specifications. Any adhesion used in the installation shall be as specified by the manufacturer. An adhesion-promoting primer shall be required when recommended by the pavement marking manufacturer.

Guides to mark the lateral location of pavement markings shall be established as shown on the plans or as directed by the Engineer. The Contractor shall establish the pavement marking guides and the Engineer will verify the location of the guides. Markings shall be placed in proper alignment with the guides. The deviation rate in alignment shall not exceed 1 inch per 200 feet of roadway. The maximum deviation shall not exceed 2 inches nor shall any deviation be abrupt.

Markings placed that are not in alignment or sequence, as shown on the plans or as stated in this specification, shall be removed and replaced by the Contractor at the Contractor's expense. Removal shall be in accordance with **Subsection 712.05,** Pavement Marking Removal. Guides placed on the roadway for alignment purposes shall not establish a permanent marking on the roadway in the opinion of the Engineer.

When markings are specified in the contract for newly paved asphalt concrete surfaces, they shall be placed immediately after final rolling of the mat. A rubber tired roller cart with a minimum weight of 200 pounds or a truck operated at no more than 3 m.p.h. shall be used to assure proper adhesion when the markings are in place. Steel wheel rollers may not be used for this purpose.

Subsection 722.09Concrete Cylinder Storage. Revise entire subsection to the following:

722.09 Concrete Cylinder Storage-The Contractor shall provide a storage shed/building for temporary storage of concrete acceptance cylinders. The storage facility shall be of sufficient size and construction to protect the concrete cylinders from the elements and damage. The storage facility location shall be approved by the Engineer and access to the storage shed/building shall be under the control of Department personnel. The storage shed shall have a concrete curing box or water curing tank with a heating/circulating system of sufficient size to properly cure all acceptance cylinders before transferring for final storage and testing. The curing box or curing tank and heater/circulator shall comply with AASHTO M-201, and proper curing of the cylinders shall be in accordance with AASHTO T-23.

SECTION 740-GEOTEXTILES. Revise heading to the following:

GEOTEXTILES AND GEOSYNTHETICS

Subsection 740.01-Description. Revise subsection to include Geosynthetics as follows:

This work shall consist of the placement of Geotextiles and Geosynthetics in accordance with these Specifications and/or Standard Drawings, at the locations and in reasonably close conformity with the lines, grades and dimensions shown on the Plans or established by the Engineer.

Subsection 740.02-Materials. Revise subsection to include Geosynthetics as follows:

Materials used in this construction shall meet the requirements of **Subsection 918.27** for the Type Geotextile or Geosynthetic called for in the plans.

The contractor shall furnish a certified laboratory test report from an approved testing laboratory with each shipment of materials. Laboratory test reports shall include the actual numerical test data obtained. All rolls shall be clearly labeled as being part of the same production run from which the test date was derived. Fabric shall be protected to prevent damage during transportation, storage, and installation. Geotextile and geosynthetic rolls shall be covered during storage to protect against UV degradation and shall be stored with rolls elevated up off of the ground. Fabric that is torn, punctured, or otherwise damaged shall not be installed.

Subsection 740.03-General. Revise subsection to include Geosynthetics as follows:

Geotextile and Geosynthetic fabric shall be placed as specified on the Plans for the specific application. The surface on which the Geotextile or Geosynthetic fabric is to be placed shall be compacted, as directed by the Engineer, and prepared as smooth as possible and free from debris, obstructions and depressions which could result in gaps, tears, or punctures in the fabric during cover operations. The Geotextile or Geosynthetic shall be installed in such a manner that placement of cover material will not excessively stretch nor tear the Geotextile or Geosynthetic. After fabric is placed, the initial lift of cover material shall be installed within five (5) calendar days. Under no circumstances shall any equipment operate directly on the Geotextile or Geosynthetic fabric. Cover material shall be placed such that at least the minimum initial lift thickness, as specified by the Engineer, is between the Geotextile or Geosynthetic and equipment tires or tracks at all times. Turning of equipment/vehicles shall not be allowed on the first lift above the Geotextile or Geosynthetic.

Subsection 740.04-Method of Measurement. Revise subsection to include Geosynthetics as follows:

Geotextiles or Geosynthetics of the type specified shall be measured by the yd^2 (m^2), complete in place. No measurement for payment will be made for overlaps, splices, sewing joints, etc.

Subsection 740.05-Basis of Payment. Revise subsection to include Geosynthetics as follows:

The accepted quantities of Geotextiles or Geosynthetics of the type specified, measured as provided for above, will be paid for at the contract unit price per yd^2.(m^2) complete in place, which price shall be full compensation for labor, equipment, materials, tools and all incidentals necessary to complete the work. Fabric that is damaged during or after placement shall be replaced or repaired, as directed by the Engineer, at the expense of the Contractor.

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

(Rev. 05-05-10)
(Rev. 09-10-14) March 1, 2006

Roadside Development

Subsection 803.02, Revise the first paragraph to the following:

803.02-Sod. New sod shall consist of live, dense, well-rooted growth of permanent grasses, free from Johnson grass, nut-grass, and other undesirable grasses or weeds, well-suited for the intended purpose and for the soil in which it is to be planted. Installed sod which does not meet these requirements shall be corrected as directed by the Engineer at the Contractors expense.

Section 800, Add the following as an entirely new Section:

SECTION 806-ROADSIDE MAINTENANCE

806.01-Description. Roadside and construction project maintenance shall consist of litter/debris removal, mowing, and trimming as specified or as directed by the Engineer for the entire highway rights-of-way where accessible (fence to fence where applicable), including shoulders for the length of the Project.

EQUIPMENT

801.02-Equipment. All equipment necessary for the satisfactory performance of this work.

CONSTRUCTION REQUIREMENTS

801.03-General. Remove litter and debris as directed by the Engineer for the entire construction limits. Disposal of litter and debris shall be in accordance with all permits, State, and Local ordinances.

Mowing and vegetation removal work shall consist of mowing and trimming of the rights-of-way for vegetation control to maintain a neat aesthetic appearance as directed by the Engineer.

806.04-Definitions.

Litter: Any object or group of objects foreign to the right-of-way which has been discarded or abandoned and is or may become visible from the edge of the roadway or shoulder as a result of mowing, vegetation management, construction, maintenance operations, or traffic. Examples under this definition include but are not limited to paper, plastic, bottles, cans, wood, tires, portions of tire, and metal products.

Mowing: The work associated with cutting or trimming vegetation primarily consisting of, but not limited to, grasses, invasive weeds, and small trees or shrubs to provide a consistent and aesthetically pleasing standing vegetation height as directed by the Engineer.

Trimming: The work associated with cutting or trimming vegetation in close proximity to objects or in areas not accessible to conventional mowers in an attempt to prevent damage and provide a consistent vegetation height.

806.05-Time and Frequency. Litter/debris removal shall be performed a minimum of twice per year or as directed by the Engineer. Mowing and trimming shall be performed a minimum of twice per growing season or as directed by the Engineer. A notice to begin will be issued to the Contractor at least five (5) days prior to the date the mowing cycle is to begin.

Work shall be performed only during the hours of daylight Monday through Saturday, or as directed by the Engineer. No work shall be conducted on Sunday.

806.06-Mowing Operations. Performed all mowing to the satisfaction of the Engineer. Standing vegetation shall be cut to a height of 4 inches while maintaining a consistent vegetation profile within construction limits. Mow only those areas that are designated as mowable acres, including, if present, a minimum of 5 feet up the back slope from the bottom of the ditch, and 5 feet behind all guardrails. Vegetation including small trees, shrubs, and bushes with a stem diameter of up to 1 inch which are inside of and encroaching upon the established mowing limits shall be cut using a mower or hand trimming methods as directed by the Engineer. Extreme care shall be taken not to damage the trees, plants and shrubs, which are designated by the Engineer to remain. Hand trimming may be required as directed by the Engineer for areas of vegetation inside the designated mowing limits which are not accessible to mechanical mowers. As work progresses, mowing and trimming shall be conducted in such a manner to provide a consistent standing vegetation height in all mowing limits adjacent to the roadway. Mow as close as practicable to all fixed objects. Hand trimming is required atop earth berms, within all rip rap areas, and around all fixed objects, including but not limited to earth berms, guardrails, cable rail, utility installations, utility poles, mailboxes, delineators, sign posts, wildflower plots, bridge abutments and bridge piers. Do not apply chemicals unless authorized by the Engineer. Actual dimensions & mowing limits shall be discussed at the Preconstruction Conference.

Mowing for site distance shall be performed as frequently as necessary to provide adequate visibility and will not be considered as part of a mowing cycle.

Compensation

806.09-Method of Measurement. Litter/debris removal shall not be measured for payment but is considered incidental to the work unless otherwise specified in the contract.

Mowing and vegetation removal will be paid by the mowing cycle. A mowing cycle includes the mowing of all areas within project limits with overgrown vegetation one time.

Mowing for site distance will not be measured for payment and shall be considered incidental to the work.

806.10-Basis of Payment. The accepted quantities of mowing will be paid for at the contract unit price per mowing cycle. All costs associated with mowing and vegetation removal shall be included in the unit bid price for mowing Item No. 806-02.03. When the Contract does not contain a pay item for mowing and vegetation removal, it shall be incidental to other items of work.

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

(Rev. 09-01-09)
(Rev. 02-06-10)
(Rev. 12-13-10)
(Rev. 02-13-12)
(Rev. 01-07-13)
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March 1, 2006

Supplemental Specifications - Section 900

of the

Standard Specifications for Road and Bridge Construction

March 1, 2006

Subsection 903.03 Coarse Aggregate for Concrete, Revise the fourth paragraph to the following:

Coarse aggregate for prestressed concrete shall be Size No. 57 or Size No. 67, **Subsection 903.22,** as may be specified or directed. Coarse aggregates for precast concrete shall include any size fractions of **Subsection 903.22**, as may be specified or directed.

Subsection 903.12 (b) - Replace with the following:

(b) Aggregate for Micro-Surface. A minimum of 50% of ~~The~~ aggregate shall be crushed slag, crushed granite or crushed stone (crushed stone as specified for the types listed for Grading D in **Subsection 903.11(c)**) meeting the gradation limits below and the physical properties of ASTM D 692 except the percent of fractured pieces shall be 100. The aggregate shall have a minimum sand equivalent (AASHTO T 176) of 65. Blends of more than one aggregate source shall be mixed by means of pug mill only. Blending aggregates with a front end loader will not be permitted. The aggregate shall be proportioned to produce a uniform gradation meeting the following requirements:

GRADATION LIMITS FOR AGGREGATE
BASED ON WASH GRADATION

	Design Master Range	Mixture Control
Sieve	(Total Percent Passing)	Tolerances
3/8 in.(9.5 mm)	100	
No. 4(4.75 mm)	70-**98**	±6.0
No. 8(2.36 mm)	45-70	±5.0
No. 16(1.18 mm)	28-50	±5.0
No. 30(600 µm)	19-34	±4.0
No. 50(300 µm)	12-25	±4.0
No. 100(150 µm)	7-18	±2.0
No. 200(75 µm)	4-15	±2.0

Subsection 904.03 Emulsified Asphalts. Replace Entire subsection with the following:

904.03 - Emulsified Asphalts.

Emulsified asphalts shall meet the following test requirements:

	Test Method	CAE-P	CSS-1	CSS-1H	SS-1H	TST-1P	CQS-1H
Saybolt-Furol Viscosity @ 77F, seconds	AASHTO T59	10-50	20-100	20-100	20-100	10-75	20-100
Saybolt-Furol Viscosity @ 122F, seconds	AASHTO T59	n/a	n/a	n/a	n/a	n/a	n/a
Storage Stability Test, 24-h, %	AASHTO T59	1 Max	1 Max	1 Max	1 Max	n/a	n/a
5-day Settlement, %	AASHTO T59	n/a	n/a	n/a	n/a	n/a	n/a
Particle Charge	AASHTO T59	Positive	Positive	Positive	n/a	n/a	Positive
Sieve Test, %	AASHTO T59	0.1 Max	0.1 Max	0.1 Max	0.1 Max	0.1 Max	0.1 Max
Residue by	AASHTO T59	Distillation	Distillation	Distillation	Distillation	Distillation[1]	Distillation
Residue, %	AASHTO T59	n/a	57 Min	57 Min	57 Min	55-60	62 Min
Demulsibility, %	AASHTO T59	n/a	n/a	n/a	n/a	n/a	n/a
Distillate, %	AASHTO T59	55 Max	n/a	n/a	n/a	n/a	n/a
Oil Test, %	AASHTO T59	12.0 Max	n/a	n/a	n/a	n/a	n/a
Stone Coating	AASHTO T59	n/a	n/a	n/a	n/a	n/a	n/a
Cement Mix	AASHTO T59	n/a	2.0 Max	2.0 Max	2.0 Max	n/a	n/a
Float Test, seconds	AASHTO T50	n/a	n/a	n/a	n/a	n/a	n/a
Solubility in Trichlorethylene, %	AASHTO T44	n/a	n/a	n/a	n/a	n/a	n/a
Penetration	AASHTO T49	300 Min	100-250	40-90	40-90	75-150	40-90
Elastic Recovery, %[3]	AASHTO T301	n/a	n/a	n/a	n/a	25 Min	n/a
Ductility @ 77F, cm	AASHTO T51	40 Min	40 Min	40 Min	40 Min	n/a	40 Min
Ductility @ 40F, cm	AASHTO T51	n/a	n/a	n/a	n/a	10-35	n/a
R&B Softening Point, ˚F	AASHTO T53	n/a	n/a	n/a	n/a	n/a	n/a
Original G*/sinδ @ 82°C	AASHTO T315	n/a	n/a	n/a	n/a	n/a	n/a

1 - Distill at 400°F
2 - Distill at 350°F
3 - Straight-sided mold, 20-cm elongation, 5 min hold, 25°C

	Test Method	CQS-1HP	SS-1	AEP	CRS-2	AE3
Saybolt-Furol Viscosity @ 77F, seconds	AASHTO T59	20-100	20-100	10-50	n/a	n/a
Saybolt-Furol Viscosity @ 122F, seconds	AASHTO T59	n/a	n/a	n/a	100-400	50 Min
Storage Stability Test, 24-h, %	AASHTO T59	n/a	1 Max	n/a	1 Max	n/a
5-day Settlement, %	AASHTO T59	n/a	n/a	5 Max	n/a	5 Max
Particle Charge	AASHTO T59	Positive	n/a	n/a	Positive	n/a
Sieve Test, %	AASHTO T59	0.1 Max	0.1 Max	0.1 Max	0.1 Max	n/a
Residue by	AASHTO T59	Distillation[2]	Distillation	Distillation	Distillation	Distillation
Residue, %	AASHTO T59	62 Min	57 Min	n/a	65 Min	n/a
Demulsibility, %	AASHTO T59	n/a	n/a	n/a	40 Min	n/a
Distillate, %	AASHTO T59	n/a	n/a	55 Max	n/a	30 Max
Oil Test, %	AASHTO T59	n/a	n/a	12.0 Max	3.0 Max	6.0 Max
Stone Coating	AASHTO T59	n/a	n/a	n/a	n/a	90 Min
Cement Mix	AASHTO T59	n/a	2.0 Max	n/a	n/a	n/a
Float Test, seconds	AASHTO T50	n/a	n/a	20 Min	n/a	200 Min
Solubility in Trichlorethylene, %	AASHTO T44	n/a	n/a	n/a	n/a	n/a
Penetration	AASHTO T49	40-90	100-200	n/a	100-250	n/a
Elastic Recovery, %[3]	AASHTO T301	n/a	n/a	n/a	n/a	n/a
Ductility @ 77F, cm	AASHTO T51	70 Min	40 Min	n/a	40 Min	n/a
Ductility @ 40F, cm	AASHTO T51	n/a	n/a	n/a	n/a	n/a
R&B Softening Point, ˚F	AASHTO T53	135 Min	n/a	n/a	n/a	n/a
Original G*/sinδ @ 82°C	AASHTO T315	n/a	n/a	n/a	n/a	n/a

1 - Distill at 400°F

2 - Distill at 350°F

3 - Straight-sided mold, 20-cm elongation, 5 min hold, 25°C

	Test Method	CRS-2P	RS-2	RS-1	TTT-1	TTT-2
Saybolt-Furol Viscosity @ 77F, seconds	AASHTO T59	n/a	n/a	20-100	30 Min	n/a
Saybolt-Furol Viscosity @ 122F, seconds	AASHTO T59	100-400	75-400	n/a	n/a	15-100
Storage Stability Test, 24-h, %	AASHTO T59	1 Max	1 Max	1 Max	1 Max	1 Max
5-day Settlement, %	AASHTO T59	n/a	n/a	n/a	5 Max	n/a
Particle Charge	AASHTO T59	Positive	n/a	n/a	n/a	Positive
Sieve Test, %	AASHTO T59	n/a	0.1 Max	0.1 Max	0.1 Max	0.1 Max
Residue by	AASHTO T59	*Evaporation*	Distillation	Distillation	Distillation	Distillation[2]
Residue, %	AASHTO T59	65 Min	63 Min	55 Min	40 Min	58 Min
Demulsibility, %	AASHTO T59	40 Min	60 Min	60 Min	n/a	n/a
Distillate, %	AASHTO T59	n/a	n/a	n/a	n/a	n/a
Oil Test, %	AASHTO T59	n/a	n/a	n/a	n/a	n/a
Stone Coating	AASHTO T59	n/a	n/a	n/a	n/a	n/a
Cement Mix	AASHTO T59	n/a	n/a	n/a	n/a	n/a
Float Test, seconds	AASHTO T50	n/a	n/a	n/a	n/a	n/a
Solubility in Trichlorethylene, %	AASHTO T44	n/a	n/a	n/a	n/a	n/a
Penetration	AASHTO T49	75-175	100-200	100-200	5-15	40-90
Elastic Recovery, %[3]	AASHTO T301	50 Min	n/a	n/a	n/a	n/a
Ductility @ 77F, cm	AASHTO T51	40 Min	40 Min	40 Min	40 Min	n/a
Ductility @ 40F, cm	AASHTO T51	n/a	n/a	n/a	n/a	n/a
R&B Softening Point, ˚F	AASHTO T53	125 Min	n/a	n/a	60-75	n/a
Original G*/sinδ @ 82°C	AASHTO T315	n/a	n/a	n/a	1.0 Min	n/a

1 - Distill at 400°F

2 - Distill at 350°F

3 - Straight-sided mold, 20-cm elongation, 5 min hold, 25°C

Emulsified asphalts used on TDOT projects shall only be from Certified Emulsified Asphalt Suppliers that have an approved Quality Control Plan in accordance with TDOT Standard Operating Procedures.

All emulsified asphalts shall be homogeneous, and shall adhere firmly to the surface of the mineral aggregate. Failure of the emulsified asphalt to perform satisfactorily on the job shall be deemed cause for rejection, notwithstanding its ability to pass laboratory tests.

The test requirement for settlement may be waived when the emulsified asphalt (special tack coat excepted) is used in less than 5 days' time; or the Engineer may require that the settlement test be run from the time the sample is received until it is used, if the elapsed time is less than 5 days.

The AE-3 shall be of such stability that it will remain constant and uniform while being mixed with dry or approximately dry aggregate, and shall thoroughly and uniformly coat the entire surface of each fragment while being manipulated and incorporated into the work. The emulsified asphalt after being incorporated into the work shall show no signs of re-emulsifying.

Solubility in trichloroethylene will be required for information only every 3 months in the supplier's quality control program.

When approved by the Engineer, cationic emulsions may be substituted for anionic emulsions.

Latex, polymer, and other emulsifiers shall be styrene butadiene rubber (SBR) or natural latex, and shall be milled into the asphalt cement and shall show no separation after mixing. When modified emulsions are utilized in microsurface mixtures, the blended mixture when combined with aggregate and mineral filler shall have the following characteristics:

1. Be capable of filling up to 1/2 in.(13 mm) wheel ruts in one pass.
2. Be capable of field regulation of the setting time.
3. Be suitable for nighttime placement.

The latex shall be combined with the asphalt emulsion at the emulsion mill to produce a homogeneous mixture. Latex modified emulsions upon standing undisturbed for a period of 24 hours shall show no color striations, but shall be a uniform color throughout.

Subsection 908.03-Permanent Steel Bridge Deck Forms; Delete ASTM A446 and A525, and **Replace** with A653

Subsection 908.03(C) First paragraph. Change to read as follows:

All high strength bolts, nuts and washers shall be certified to have met the specified tests identified in their individual ASTM Specification designations, both as individual components, and as assemblies (Bolts, Nuts, and Washers).

Subsection 908.07-Gray Iron Castings. Reviseentire subsection to the following:

908.07-Gray Iron Castings. All castings shall be of the type specified and shall be within reasonably close conformity with the dimensions shown on the Plans. The castings shall conform to AASHTO M105, with the additional requirements herein, and unless otherwise specified all castings shall be Class 30.

Test bars for tension testing shall be cast in accordance with AASHTO M 105, Table 2, Test Bar B.

All castings shall be cleaned of sand and scale by sand blasting or other effective methods so as to present a smooth, clean, and uniform surface.

Gray iron castings shall have the date of manufacture cast into each unit.

Manhole castings shall have the lid and lid seat of the rim machined to form a true bearing.

All castings shall weigh at least 95% of the theoretical weight shown on the Plans.

Subsection 910.02-Revise entire Subsection to the following:

910.02-Quick Dry Traffic Marking Paint (White and Yellow). These specifications cover quick dry white and yellow traffic paint, also referred to as pigmented binder, for use in marking traffic lanes or barrier lines on bituminous and concrete highways.

(a) General Requirements. The pigmented binder shall be properly formulated so as to be suitable for application by spray equipment when heated to 130°F(55°C) maximum and applied on bituminous or portland cement concrete pavements.

(b) Drop on Glass Beads. The glass beads drop-on type, shall meet the requirements of AASHTO M 247 Type I.

General: All beads used for Pavement Markings shall be clear, transparent, colorless glass, smooth and spherically shaped, free of milkiness, pits, or excessive air bubbles and conform to the following specific requirements.

Glass Beads shall not contain more than 200 ppm of lead, 200 ppm of antimony, or 200 ppm of arsenic. The contractor shall certify and ensure that all glass beads meet all federal requirements. The contractor shall provide certification that all glass beads contain no more than 200 parts per million of arsenic or lead as determined by a certified independent (third party) laboratory, in accordance with Environmental Protection Agency testing methods 3052, 6010B, or 6010C. The contractor shall provide an independent certified test report showing compliance with these requirements.

Silica content of the glass beads shall be no less than 60%.

Color and Clarity: Beads shall be colorless, clear and free from carbon residues.

Roundness: Minimum true spheres overall shall be 80% when tested in accordance with ASTM-D-1155, for larger beads use visual inspection.

Index of Refraction: Minimum of 1.50, when tested by the liquid emersion method @ 77°F

Air Inclusions: Maximum of 3% overall

(b) Paint.

Characteristic requirements.

1. Pigment content shall be between 58% and 65% by weight. Pigment for white paint shall contain 0.99 lbs/gal.(120 grams/l) of 94% titanium dioxide. Pigment for yellow paint shall be lead free and contain 0.22 lbs/gal.(26 grams/l) minimum of 94% titanium dioxide.
2. Total non-volatile shall not be less than 76% by weight.
3. Vehicle non-volatile shall not be less than 41% by weight. Vehicle shall be Rohm and Haas E-2706, DOW DT211NA or an approved equal.
4. Minimum weight shall not be less than 13.3 lbs./gal.(1,600 grams/l).
5. The paint viscosity shall be between 78 and 95 Kreb units when tested at 77±° F(25±1°C) in accordance with ASTM D 562.
6. Drying Time:

   FIELD -The paint shall dry to a no-tracking condition in 3 minutes when applied at 15 ±1 mil(380 ±25 μm.) wet film thickness with a bead application rate of 6 lbs./gal.(0.7 kgs/l) of glass spheres per gallon(liter) of binder, when the pavement temperature is between 40 and 120° F(4 and 49 C°) and the relative humidity is not exceeding 80%. The pigmented binder shall be applied with specialized equipment so as to have the binder at a temperature of 100 to 130° F(35 to 55° C) at the spray gun. The no-tracking condition shall be determined by passing over the line as applied above in a simulated passing maneuver with a passenger car travelling 35 mph(56 kph.). A line showing no visual deposition when viewed from a distance of 50 ft.(15 m) shall be considered as conforming to this drying requirement.

   LAB - The pigmented binder without glass spheres, shall dry to no-pick-up condition in 10 minutes or less when tested in accordance with ASTM D 711.
7. The paint shall meet the current EPA VOC requirements or 150 grams/l whichever is lower.
8. The ph of the paint shall be a minimum of 9.6.

Qualitative Requirements.

The finished paint shall meet the following quality requirements:

1. Condition in container: The paint received shall show no livering, skinning, mold growth, corrosion of the container, or hard settling of the pigment. Any settling shall be readily dispersed when stirred by hand with no persistent foaming.
2. Color: The color for white after drying shall be flat white, free from tint, furnishing good opacity and visibility under both daylight and artificial light. For yellow, the color shall closely match chip 33538 of Federal Standard 595B.
3. Flexibility: The paint shall show no cracking or flaking when tested on a ½ in.(13 mm) mandrel in accordance with Federal Specification TT-P-1952B.
4. Dry Opacity: The minimum contrast ratio shall be 0.95 when drawn with a 0.005 Bird Applicator.
5. Daylight Reflectance: The daylight directional reflectance of the white paint shall be not less than 85% and not less than 50% for yellow(relative to manganese oxide) when measured in accordance with Federal Test Method No. 1416.
6. Bleeding: The paint shall have a minimum bleeding ratio of 0.97 when tested in accordance with Federal Specification TT-P-1952B.
7. Scrub Resistance: The paint shall pass 300 cycles when tested in accordance with ASTM D 2484.

8. Freeze-Thaw Stability: The paint shall show no change in consistency greater than 10% when tested in accordance with Federal Specification TT-P-1952B.
9. Storage Stability: When stored at 77± °(25 ±2°C) in a 3/4- filled can for a period of 30 days, the paint shall be in a homogeneous state with no skinning, curdling, hard settling or caking that cannot be readily remixed.

(e) Inspection, Testing, Packaging, and Marking.

All paint furnished under this specification shall be proportioned in accordance with the characteristic requirements set forth herein. Compounding shall be from ingredients or component materials that have been found to conform with the detail specifications as set forth herein by reference or otherwise. After manufacture, a 0.5 pt.(l) sample along with certified laboratory analysis for each batch shall be sent to the Division of Materials and Tests. A qt.(l) sample and a manufacturer's certification that the glass beads meet the requirements of ASSHTO M 247 for the type beads, shall be sent to the Division of Materials and Tests for each batch or lot of glass beads shipped for use on Tennessee projects.

Each shipment of paint and beads shall be accompanied by a detailed analysis for that particular batch and certification that all ingredients meet the requirements set forth in this specification.

The Department reserves the right to perform in-plant sampling of ingredients and finished product during manufacturing operations and to sample the packaged product when it is received by the Department. Acceptance of the product may be withheld until analysis of samples has been completed.

All paint shall be shipped in new containers that can be properly sealed.

All containers shall be plainly marked or labeled to show the following information: Description of paint, color, net gal.(liters), name of manufacturer, batch number and date of manufacture(month and year).

Subsection 914.09 Polyvinyl Chloride Pipe (PVC). Revise entire subsection to the following:

914.09-Polyvinyl Chloride Pipe(PVC) . Pressurized pipe accepted under this Specification shall conform to the requirements of ASTM D 1785. Pipe Culverts accepted under this Specification shall conform to the requirements of ASTM D 1784.

Subsection 914.10-High Density Polyethylene Plastic Pipe. Revsie entire subsection to the following:

914.10, High Density Polyethylene Plastic Pipe. Pipe Culverts accepted under this specification shall conform to the requirements of AASHTO M 294, Type S. Slope Drains accepted under this specification shall conform to the requirements of AASHTO M 294, Type C or Type S.

Subsection 916.02 (a) Aluminum flat Sheet; **Revise** as shown below:

(a). Aluminum flat sheet (sign blanks) and plates (permanent and temporary) shall meet ASTM B 209, Alloy 6061 T6 or 5052-H38. Recycled aluminum flat sheet (sign blanks) meeting ASTM B209, Alloy 6061 T6, or 5052-H38 may be used for temporary signing only. Composite material

sign blanks (temporary signing only) shall be selected from the Department's QPL. The sign blanks shall be flat and shall contain no visible lateral bow.

Subsection 918.08: Replace entire section, with the following:

918.08-Preformed plastic pavement Marking Materials. The marking material shall be prefabricated plastic consisting of white or yellow pigmented plastic with reflective glass spheres uniformly distributed throughout the entire cross sectional area and shall be capable of being affixed to bituminous or Portland cement concrete pavement by either a pressure sensitive pre-coated adhesive or liquid contact cement. The material shall be provided complete in a form that will facilitate rapid application and protection during shipment and storage. Solvents, adhesives and necessary equipment for proper application for life shall be in accordance with manufacturer's instructions. The material shall be manufactured and packaged in such a manner to permit storage at normal shelf temperatures for periods of up to one year after purchase. Contact cements, where used, shall have a shelf life of 6 months. The material shall mold itself to pavement contours, breaks, faults, and the like by action of traffic at normal pavement temperatures. The material shall have resealing characteristics so that it will fuse with itself and with previously applied marking materials of the same composition under normal conditions of use.

Prefabricated legends and symbols must conform to the applicable shapes and sizes as outlined in the Manual on Uniform Traffic Control Devices for Streets and Highways. These pavement markings shall be on the Department's QPL.

Materials: The marking material shall be a 60 mil (1.50 mm) retroreflective pliant polymer conforming to the following requirements. The retroreflective pliant polymer pavement marking film shall consist of a mixture of high quality polymeric materials and pigments with 1.50 minimum refractive index glass spheres uniformly distributed throughout its cross sectional area, and with a reflective layer of beads bonded to the top surface. Composition shall be as follows:

Material	Min. % by Weight
Resins & Plasticizers	20
Pigments	30
Graded Glass Beads	33

This material shall be capable of adhering to asphaltic or Portland cement concrete, by means of a pressure sensitive, pre-coated adhesive, or by a liquid contact cement applied at the time of installation.

Tensile Strength. The film shall have a minimum tensile strength of 40 psi (275 kPa) of cross section when tested according to ASTM D 638. A sample 6 x 1 x 0.06 in.(150 x 25 x 1.5 mm) shall be tested at a temperature between 70° and 80° F(21 to 27° C) using a jaw speed of ¼ in.(6 mm) per minute.

Elongation. The film shall have a minimum elongation of 75% when tested according to ASTM D 638.

Plastic Pull Test. A test specimen made the same size as described under "Tensile Strength" above shall support a dead weight of 4 lbs. (1.8 kgs.) for not less than 5 minutes at a temperature between 70 and 80° F (21 to 27° C).

Pigmentation. The pigments shall be selected and blended to provide a marking film that is white or yellow conforming to standard highway colors through the expected life of the film.

Pigments. Sufficient titanium dioxide pigment meeting Federal Specification TT-P-442 shall be used in white markings to insure a dense opaque marking. Pigments shall include titanium dioxide for white plastic and C. P. medium chrome yellow for yellow plastic.

Sufficient medium chrome yellow pigment meeting Federal Specification TT-P-346b, Type 111, shall be used to insure a durable finished color that complies with

Highway Yellow Color Tolerance Chart and matches Chip 33538 of Federal Standard 595. The yellow plastic shall have a minimum of 18% pigment as chrome yellow.

Glass Beads. The glass beads shall be, colorless and have a minimum index of refraction of 1.50 when tested using the liquid oil immersion method. The size and quality of the beads will be such that performance requirements for the retroreflective pliant polymer film shall be met.

Glass beads shall not contain more than 200 ppm of lead, 200 ppm of antimony, or 200 ppm of arsenic. The contractor shall certify and ensure that all glass beads meet all federal requirements. The contractor shall provide certification that all glass beads contain no more than 200 parts per million of arsenic or lead as determined by a certified independent (third party) laboratory, in accordance with Environmental Protection Agency testing methods 3052, 6010B, or 6010C. The contractor shall provide an independent certified test report showing compliance with these requirements.

The film shall have a glass bead retention quality such that when a 2 x 6 in. (50 x 150 mm) sample is bent over a 1/2 in. (13 mm) diameter mandrel, with the 2 in. (50 mm) dimension perpendicular to the mandrel axis, microscopic examination of the area on the mandrel shall show no more than 10% of the beads with entrapment by the binder of less than 40%.

Skid Resistance. The surface of the retroreflective pliant polymer shall provide a minimum skid resistance value of 35 BPN when tested according to ASTM E 303.

Color: ***The color of the*** *white* ***thermoplastic material shall be pure white and conform to Federal standard 595-17778. The color of the*** *yellow* ***thermoplastic material shall conform to Federal Standard 595-33538 and meet the following chromaticity specifications.***

X and **Y** coordinates shall fall in an area bordered by these coordinates:

X	**0.470**	**0.510**	**0.490**	**0.537**
Y	0.455	0.489	0.432	0.462

Reflectance. The white and yellow markings shall have the following minimum initial retroreflectance values as measured in accordance with the testing procedures of ASTM D 4061. The photometric quantity to be measured shall be specific luminance (SL) and shall be expressed as millicandelas per square foot per footcandle.

	White		**Yellow**	
Entrance Angle	86.0	86.5	86.0	86.5
Observation Angle	0.2	1.0	0.2	1.0
Specific Luminance	500	300	400	175

Thickness. The retroreflective pliant polymer film without adhesive shall be supplied in a standard thickness of 60 mils (1.5 mm).

Performance. The retroreflective pliant polymer, when applied according to the recommendations of the manufacturer, shall provide a neat, durable marking that will not flow or distort due to temperature if the pavement surface remains stable. The pliant polymer shall provide a cushioned resilient substrate that reduces bead crushing and loss. The film shall be weather resistant, and through normal traffic wear shall show no appreciable fading, lifting or shrinkage throughout the useful life of the marking. It shall also show no significant tearing, roll back or other signs of poor adhesion.

Subsection 918.09 B 3 Chemical Additives, Add the following as **Subsection B-3:**

3 Warm Mix Asphalt (WMA) additives. Organic wax or foaming additives may be added to bituminous plant mix to reduce placement temperatures in accordance with subsection 407.11. WMA additives should be introduced into the mixture at a constant rate satisfactory to produce mix temperatures as per subsection 407.11. If the proportions of the additive change during the course of mix production, these changes shall be noted and recorded. The manner in which the additive is introduced into the mixture shall be approved by the Department. The Department will maintain a list of qualified WMA additives. No product shall be used unless it appears on this list.

Subsection 918.18-Mulch Material, Add the following as the last sentence:

"An approved tackifier from the QPL shall be used to hold mulch in place."

Subsection 918.23; Remove and Replace entire subsection with the following:

918.23- Thermoplastic Pavement Marking Material. This material shall conform to AASHTO M-249 with the following changes. The material requirements are as follows.

Composition: The retroreflective pavement marking material shall be an Alkyd / Maleic based thermoplastic material consisting of homogeneously mixed pigments, filler, resins and glass beads. The pigment, beads, and filler shall be uniformly dispersed in the resin. The material shall be manufactured from virgin material using no reprocessed components.
The material shall be free from all skins, dirt, and foreign objects and shall comply with requirements from the following table.

TABLE 1

Component	White	Yellow
% Binder Content	19.0 min	19.0 min
% TiO_2 Pigment,	10.0 min	N/A
% Intermix Glass Beads	35 min	35 min
% Calcium Carbonate \ Fillers	36 max*	46 max*

*The amount of Calcium Carbonate and inert fillers shall be as opted by the manufacturer, providing all other specifications are met.

The Titanium Dioxide shall be Rutile Type II in accordance with ASTM D 476 with a minimum purity of 93%.

Use white thermoplastic which does not contain anatase titanium dioxide pigment.

The total silica content used in the formulation of the thermoplastic shall be the premixed beads. Uniformly disperse the pigment, beads and filler in the binder.

The Alkyd / Maleic binder shall consist of a mixture of synthetic resins and high boiling point plasticizers one of, which shall be solid at room temperature. At least one-half of the binder composition shall be 100% Maleic modified glycerol ester of resin and shall be no less than 15% of the entire material formulation. The binder shall contain no petroleum, hydrocarbon resins, tall oil resins or rosins.

The thermoplastic material shall be free of contaminates and shall be dry blended or hot mixed from 100% virgin stock using no reprocessed materials.

The Thermoplastic material shall be formulated such that when it is on the roadway surface at any natural temperature it exists in a hard, solid state with cold ductility that permits normal movement with the road surface without chipping, or cracking.

The thermoplastic shall not deteriorate or discolor when held at the application temperature for periods of time up to 4 hours or upon repeated reheating (a minimum of 4 times).

The color, viscosity, and chemical properties versus temperature characteristics of the thermoplastic material shall remain constant for up to 4 hours at the application temperature and shall be the same from batch to batch.

The thermoplastic material shall be readily applicable at temperatures between 400°F and 440°F from the approved equipment to produce lines and symbols of the specified thickness above the pavement surface.

Physical Requirements: After 4 hours @ 425°F

The thermoplastic material after heating for 4 hours ± 5 minutes at 218 ± 2°C (425 ± 3°F) and cooled to 25 ± 2°C (77 ± 3°F) shall meet the physical requirements set forth in AASHTO M-249 with the following changes.

The material shall be tested in accordance with AASHTO T-250 and or with the appropriate method in Federal Test Method Standard #141 or ASTM Designation.

Safety – No toxic fumes.

Bond Strength – (ASTM-D4796), 180 p.s.i. min.

Specific Gravity – Not to exceed 2.30

Yellowness Index – The white thermoplastic shall not exceed a yellowness index of 0.15.

Glass Beads

General: All beads used for Thermoplastic Pavement Markings shall be clear, transparent, colorless glass, smooth and spherically shaped, free of milkiness, pits, or excessive air bubbles and conform to the following specific requirements.

Glass Beads shall not contain more than 200 ppm of lead, 200 ppm of antimony, or 200 ppm of arsenic. The contractor shall certify and ensure that all glass beads meet all federal requirements. The contractor shall provide certification that all glass beads contain no more than 200 parts per million of arsenic or lead as determined by a certified independent (third party) laboratory, in accordance with Environmental Protection Agency testing methods 3052, 6010B, or 6010C. The contractor shall provide an independent certified test report showing compliance with these requirements.

Silica content of the glass beads shall be no less than 60%.

Color and Clarity: Beads shall be colorless, clear and free from carbon residues.

Roundness: Minimum true spheres overall shall be 80% when tested in accordance with ASTM-D-1155, for larger beads use visual inspection.

Index of Refraction: Minimum of 1.50, when tested by the liquid emersion method @ 77°F

Air Inclusions: Maximum of 3% overall

Intermix Glass Beads

Glass Beads used for intermix shall be premixed into the thermoplastic mixture and shall consist of 35% of the overall thermoplastic formulation. Intermix beads shall be uncoated and defined by two distinct gradations and meet the following requirements.

Type 1 Intermix glass beads shall comprise 50% minimum of the 35% of the overall thermoplastic formulation (Intermix Glass Beads) and shall conform to AASHTO M-247-09, Type 1 with the exception of minimum true spheres overall shall be 80% as stated above, when tested in accordance with ASTM D-1155.

Type 3 Intermix glass beads shall comprise 50% minimum of 35% of the overall thermoplastic formulation (Intermix Glass Beads) and shall conform to AASHTO M-247-09, Type 3 with the exception of minimum true spheres overall shall be 80% as stated above, when tested in accordance with ASTM D-1155.

Specification for Double Drop System

The double drop system shall be capable of applying glass beads at the specified application rates. Beads shall be applied across the entire line width assuring uniform application and embedment of the beads to 50 to 60% of the bead diameter.

Type 1 drop on beads shall be dual coated for moisture resistance and adhesion , Also meet the requirements of AASHTO M-247-09 Type 1 with the exception that the beads shall be 80% round overall.

Type 4 drop on beads shall be dual coated for moisture resistance and adhesion , Also shall meet the requirements of AASHTO M-247-09 Type 4 with the exception that the beads shall be 80% round overall.

918.26-Raised Reflective Pavement Markers with Adhesive. Remove "**with Adhesive**" from the subsection title.

Subsection 918.27-Geotextile. Add "and Geosynthetics" to subsection title. **Replace** entire subsection with the following:

Geotextile and Geosynthetic materials and their types shall be on the Departments Qualified Products List. Geotextile and Geosynthetic material used shall meet the material requirements of the Standard Drawing.

The contractor shall furnish a certified laboratory test report from an approved testing laboratory and a certified letter stating the product is the same as on the Department's Qualified Products List with each shipment of materials. Laboratory test reports shall include the actual numerical test data obtained. All rolls shall be clearly labeled as being part of the same production run from which the test date was derived. Fabric shall be protected to prevent damage during transportation, storage, and installation. Geotextile and Geosynthetic rolls shall be covered during storage to protect against UV degradation and shall be stored with rolls elevated up off of the ground. Fabric that is torn, punctured, or otherwise damaged shall not be installed.

S T A T E **OF** **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".

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

(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.

STATE **OF** **TENNESSEE**
February 6, 2010 March 1, 2006

CONTRACTOR EMPLOYEE SAFETY AND HEALTH PROGRAM (EFFECTIVE THE MARCH 19, 2010 LETTING)

At the preconstruction meeting, the Contractor shall submit to the Project Supervisor written certification of an Employee Safety and Health Program (ESHP) developed by a safety professional with a minimum of 30 hours OSHA Construction Training. The certification letter shall include the following:

1. Certification that the ESHP meets or exceeds all Federal, State, and local safety and health standards.
2. Qualifications of safety professional responsible for developing and maintaining the ESHP.
3. Chief Safety Personnel- Management-level personnel responsible for managing and implementing the ESHP for the company. Include the name and 24/7contact information.
4. On-Site Safety Personnel - Supervisory-level personnel responsible for implementing and monitoring the ESHP. Include 24/7 contact information.
5. Traffic Control Coordinator. Include the name and 24/7 contact information.
6. Prime contractor shall insure all sub-contractors have a safety program. The Prime Contractor is responsible for work site safety. The Prime contractor is responsible for conducting all operations so as to protect the workers engaged in duties connected with the work.

The ESHP is a living document and shall be updated as needed. The Contractor shall maintain an original copy at the company's headquarters and shall provide to the Department upon request. Certification of an ESHP will be required before any work can begin.

The ESHP shall at a minimum include the following:

1. **Description.** Describe in detail how the ESHP is implemented and monitored. Provide guidelines for protecting personnel from hazards associated with project operations and activities. Establish the policies and procedures for safety practices that are necessary for the work to be in compliance with the requirements of TOSHA, the MUTCD and other State and Federal regulatory agencies with jurisdiction, rules, regulations, standards, or guidelines in effect at the time the work is in progress.

2. **Certification, Responsibility, and Identification of Personnel.** Identify the safety professional responsible for developing the ESHP and provide that person's qualifications for developing the ESHP. Qualifications should include but not limited to: education, training, certifications, and experience in developing this type of ESHP.

a. Provide a certification, executed by the safety professional that developed the ESHP, stating that the safety program complies with the rules, regulations, standards, and guidelines in effect at the time the work is in progress, of TOSHA, the MUTCD and other applicable Federal, State, and local regulatory agencies having jurisdiction.

b. Identify the Chief Safety Personnel and designate the On-Site Safety Personnel at supervisory-level responsible for implementing and monitoring the ESHP and having the authority to take prompt corrective measures to eliminate hazards, including the authority to stop work. Include documentation of training provided to the On-Site Safety Personnel.

c. For work that requires a competent person as defined by TOSHA, ensure that the On-Site Safety Personnel is capable of identifying existing and predictable hazards and has the authority to take prompt corrective measures to eliminate the hazards, including the authority to stop work. Include documentation of the qualifications of such competent persons identified, including certifications received.

d. For work that requires flagging, all flaggers will have proof they have completed an approved Flagging Course.

3. **Elements of the Program.** Include information and procedures for the following elements:

a. **Chain of Command.** Include the responsibilities of the management, supervisors, safety personnel, and employees.

b. **Traffic Control Coordinator.** Include the name and 24/7 contact information. Ensure that the traffic control coordinator meets the requirements specified in the MUTCD and holds a Work Zone Safety Supervisor certificate (ATSSA, NHI, UT).

c. **Chief Safety Personnel.** The Chief Safety Personnel shall have a minimum of 10 hours OSHA Construction training and the authority to make immediate decisions concerning safety and health, including the authority to stop work. Include the name and 24/7contact information. Ensure that the Chief Safety Officer meets the requirements specified in TOSHA.

d. **On-site Safety Personnel.** The On-Site Safety Personnel shall have a minimum of 10 hours OSHA Construction training and the authority to make immediate decisions concerning safety and health. Include the name and 24/7contact information. Ensure that the On-Site Safety Personnel meets the requirements specified in TOSHA.

e. **Emergency Procedures.** Provide guidelines for handling emergencies, including emergency action plans for incidents involving a worker’s death or serious injury, property damage, fires, explosions, and severe weather. Include the 24/7 emergency contact information of the Contractor's personnel responsible for handling emergencies.

f. **Local Emergency Telephone Numbers.** Include police, fire, and medical numbers. This item will be in the project specific copy to be kept at each worksite.

g. **Training Topics.** Include regulatory and jobsite safety meetings.

h. **Contractor's Safety Rules.** Include employee safety, housekeeping procedures and personal protective equipment requirements.

i. **Employee Disciplinary Policy as related to safety issues.** Documentation shall be maintained at the contractor's headquarters.

j. **Work-Site Safety Checklists.** Include project safety-planning, emergency plans and procedures, documentation, and protective materials and equipment. Define procedures for routine work site inspections and correcting hazards reported by employees.

k. **Personnel Injuries.** Record all work-site accidents including cause and correction and provide to the department upon request.

l. **Hazard Communication Program.** Provide the following:

1. The location of and instructions for understanding the Manufactures Safety Data Sheet (MSDS). Ensure that the location and instruction are available to anyone within the project Limits.

2. The person responsible for the hazard communication program and the method of informing personnel of the hazardous communication program. Attendance sheets of hazard communication meetings shall be maintained.

3. Provide employees a procedure for reporting and recording safety and health concerns to the On-Site Safety Personnel and the Chief Safety Personnel who have the authority to make immediate corrections.

4. When performing work that generates airborne crystalline silica or lead, include engineering and work practice controls to limit exposure levels to, at, or below the permissible exposure limit according to TOSHA. Ensure that the program includes employee training and respiratory protection measures according to TOSHA and control of the area when the permissible exposure limit is exceeded. Provide a trained and competent person, according to TOSHA, within the Project Limits at all times when performing work that produces airborne crystalline silica or lead.

m. **Additional Requirements.** Provide additional procedures for Project specific topics including but not limited to:

1. Compressed gas cylinders.
2. Confined spaces.
3. Cranes.
4. Electrical.
5. Equipment operators.
6. Fall protection.

7. Hand and power tools.
8. Hearing conservation.
9. Highway safety. See supplement specification 700SS
10. Lead.
11. Lock out/tag out.
12. Materials handling, storage, use, and disposal.
13. Night work.
14. Personal protective equipment.
15. Project entry and exit.
16. Respiratory protection.
17. Sanitation.
18. Signs, signals, and barricades.
19. Subcontractors.
20. Trenching.
21. Flagging.

The Contractor is responsible for implementing, monitoring, updating, and revising the ESHP. If an incident occurs that requires hospitalization, or TOSHA Citation to be submitted, notification of the incident shall be sent to the Project Supervisor and forwarded to the Regional Safety Coordinator.

On-call guardrail, sweeping, on-call striping/retracing, litter removal, tree services, mowing, and work performed at Welcome Centers and Rest Stops, will be considered Maintenance Contracts. The Maintenance Contractor, while performing the above listed projects, will have a Safety and Health Program, a Work Zone Traffic Control Supervisor and a Safety Manager. . Certification of an ESHP will be required before any work can begin. The certification letter shall include the following items and names (with 24/7 contact numbers) for:

- Safety and Health Program developed by a safety professional with a minimum of 30 hours OSHA Construction Training. This plan will cover the unique and specific hazards posed by the intended work including a Hazard Communication Program as defined as above.
- Traffic Control and Safety Supervisor to ensure that the traffic control meets the requirements specified in the MUTCD and holds a Work Zone Safety Supervisor certificate (ATSSA, NHI, UT); also have a minimum of 10 hours OSHA Construction training. This employee must have the authority to make immediate decisions concerning safety and health, including the authority to stop work.

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

March 1, 2006
Project No.: NH-I-75-1(138)
06001-8178-44, 33005-8178-44

County: Bradley & Hamilton

SPECIAL PROVISION

REGARDING

"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":

1. Items 712 – Traffic Control Items
2. Items 713 – Signing Items
3. Items 716 – Pavement Marking Items

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

November 4, 2014
Project No.: NH-I-75-1(138),
06001-8178-44, 33005-8178-44
Counties: Bradley and Hamilton
Contract Number: CNN306

SPECIAL PROVISION

REGARDING

PROJECT COMPLETION AND LIQUIDATED DAMAGES

This project shall be completed in its entirety on or before July 31, 2015.

All lane closures must be approved in advance by the Engineer. A minimum of seven days of notice must be provided in advance of any closure. Lane closures will only be allowed between the hours of 7:00PM and 6:00AM. No lane closures will be allowed on weekends (Friday at 6:00 AM until Sunday at 7:00 PM) when the University of Tennessee plays football in Knoxville. No lane closures will be allowed during Holidays or Holiday weekends or other restricted periods as defined in the plans and specifications.

For each hour or portion thereof, which any traffic lane remains closed in conflict with the restricted periods, the sum of $1,000 per hour per lane shall be deducted from monies due the Contractor, not as a penalty, but as liquidated damages.

No partial payments, including payment for stockpile materials, shall be made before work begins.

S T A T E **OF** **T E N N E S S E E**

(Rev. 10-01-06) March 1, 2006
(Rev. 11-03-08)
(Rev. 01-03-13)

SPECIAL PROVISION
REGARDING
PAYMENT ADJUSTMENT FOR FUEL

This special provision covers the method of payment adjustment for fuel price increases or decreases. Payment adjustments will be made in monthly increments based on the estimated fuel consumed on major items of work, the estimated price per gallon of fuel at the time of letting, and the percentage change of the Producer Price Index for Light fuel oils, Series ID Number WPU0573, published by the U.S. Department of Labor, Bureau of Labor Statistics.

The estimated price per gallon of fuel for this contract is **$ 2.94**

The September 2014 Price Index (Ib) for light fuel oils shall be used for this contract. Adjustments will be based on the price index in effect for the month in which the item was installed.

Fuel consumption for payment adjustment shall be based on the following:

Item Number	Description of Work	Gallons per unit	Unit of measure
203	Any Road and Drainage Excavation	0.25	Cubic Yard
203	Any Borrow Excavation (Rock)	0.36	Cubic Yard
203	Any Borrow Excavation (Other than Solid Rock)	0.25	Cubic Yard
203	Any Borrow Excavation (Rock)	0.16	Ton
203	Any Borrow Excavation (Other than Solid Rock)	0.11	Ton
203-05	Undercutting	0.25	Cubic Yard
203	Any Embankment (in-place)	0.25	Cubic Yard
303, 309, 312	Any Aggregate Base	0.79	Ton
313, 501	Treated Permeable Base or Lean Concrete Base	0.10	Square Yard
307	Any Bituminous Plant Mix Base (HM)	2.98	Ton
411	Any Bituminous Concrete Surface (HM)	2.98	Ton
501	Any Portland Cement Concrete Pavement		
	≤ 10 in. thickness	0.25	Square Yard
	> 10 in. thickness	0.30	Square Yard

No payment adjustment for fuel shall be made on any item of work which is not listed above.

No payment adjustment for fuel shall be made unless the price index varies 5% or more from the index indicated in this Special Provision.

Where the price index varies 5% or more, the payment adjustment will be made as follows:

$PA = [(Ic \div Ib) - 1] \times Fe \times Fp$

Where:

PA =Payment Adjustment (may be plus or minus)
Ic =Index for Current Month
Ib =Index for Bidding
Fe =Estimated Fuel in Gallons used based on above table and work paid for during adjustment month. [$\sum$ (Pay quantity x Gallons per unit)= Fe]
Fp = Fuel Price for Bidding

The Project Engineer will compute the payment adjustment for fuel on work sheets similar to the one attached and will furnish a copy of the calculations upon request to the prime contractor and approved subcontractors.

Upon the expiration of the allocated working time, as set forth in the original contract or as extended by Change Order, payment adjustments for fuel will continue to be made only when the "Index for Current Month" is **less** than the "Index for Bidding" and varies 5% or more.

Payment adjustment, for fuel provided after the expiration of the allocated working time and where the "Index for Current Month" **exceeds** the "Index for Bidding", will **not** be made until after the contract records have been approved by Final Records (FR)/Materials & Tests (MT) and a Final Estimate is ready to be processed. Upon contract record approval by FR/MT, fuel payment adjustments shall be calculated for each month where the allocated working time has expired, the "Index for Current Month" **exceeds** the "Index for Bidding", and the indices vary 5% or more. The calculation of the fuel payment adjustment shall be made using the "Index for Current Month" or the "Index for Contract Completion Date" in accordance with the following formulas:

The "Index for Contract Completion Date" is the fuel index in effect on the allocated Contract Completion date or the completion date as extended by Change Order.

"Index for Current Month" is **less** than "Index for Contract Completion Date"

$PA = [(Ic \div Ib) - 1] \times Fe \times Fp$

"Index for Current Month" is **greater** than "Index for Contract Completion Date"

$PA = [(Icd \div Ib) - 1] \times Fe \times Fp$

Where:

PA = Payment Adjustment (may be plus or minus)
Ic = Index for Current Month
Ib = Index for Bidding
Icd= Index for Contract Completion Date (or as extended by Change Order)
Fe = Estimated Fuel in Gallons used based on above table and work paid for during adjustment month. [$\sum$ (Pay quantity x Gallons per unit)= Fe]
Fp = Fuel Price for Bidding

Payment Adjustment for fuel will be made under:

Item No.	Description	Pay Unit
109-01.01	Payment Adjustment for Fuel	Dollar

Monthly Payment Adjustment for Fuel Worksheet

Project No._____ Contract No._____

County_____

Fuel Price (Fp)_____Price Index Bidding (Ib)_____Current Price Index (Ic) _____

Index for Contract Completion Date (or as extended by Change Order) (Icd)_____

Estimate Period: Work Performed_____Adjustment Paid_____
(Month/Yr)

Item	Unit	Quantity		Fuel Factor		Total Fuel
_____	____	_____	x	_____	=	_____
_____	____	_____	x	_____	=	_____
_____	____	_____	x	_____	=	_____
_____	____	_____	x	_____	=	_____
_____	____	_____	x	_____	=	_____
_____	____	_____	x	_____	=	_____
_____	____	_____	x	_____	=	_____
_____	____	_____	x	_____	=	_____
_____	____	_____	x	_____	=	_____
_____	____	_____	x	_____	=	_____
_____	____	_____	x	_____	=	_____
_____	____	_____	x	_____	=	_____
_____	____	_____	x	_____	=	_____
_____	____	_____	x	_____	=	_____
_____	____	_____	x	_____	=	_____

Total Fuel for Month (Fe)_____

$PA = [(Ic \div Ib) - 1] \times Fe \times Fp$
$PA = [(Icd \div Ib) - 1] \times Fe \times Fp$

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

(Rev. 06-01-00) March, 2006
(Rev. 08-01-00)
(Rev. 08-02-00)
(Rev. 01-07-13)

SPECIAL PROVISION

REGARDING

PAYMENT ADJUSTMENT FOR BITUMINOUS MATERIAL

This Special Provision covers the method of payment adjustment for bituminous materials.

100% Virgin Bituminous Material

A payment adjustment will be made to compensate for increases and decreases of 5% or more in the contractor's bituminous material cost. The normal bid items in the contract covering the bituminous material shall not be changed. Payment adjustments (+/-) shall be paid under "Payment Adjustment for Bituminous Material" and calculated as described herein:

A "Basic Bituminous Material Index" will be established by the Tennessee Department of Transportation prior to the time the bids are opened. This "Basic Bituminous Material Index" is the average of the current quotations on P.G. 64-22 from suppliers furnishing asphalt cement to contractors in the State of Tennessee. These quotations are the cost per ton f.o.b. supplier's terminal.

The "Basic Bituminous Material Index" for this project is __**$613.00**__ per ton.

The "Monthly Bituminous Material Index" is also established on the first day of each month by the same method. A payment adjustment shall be made provided the "Monthly Bituminous Material Index" varies 5% or more (+/-) from the "Basic Bituminous Material Index".

Where the price index varies 5% or more, the payment adjustment will be made as follows:

PA = [Ic - Ib] x T

Where:

PA =	Price Adjustment for Adjustment Month
Ib =	Basic Bituminous Material Index
Ic =	Monthly Bituminous Material Index
T =	Tons bituminous material for Adjustment Month

Payment adjustment will be applied to all asphalt cement, asphalt emulsion, or bituminous material used for paving on this project.

Upon the expiration of the allocated working time, as set forth in the original contract or as extended by Change Order, payment adjustments for bituminous material will continue to be

made only when the "Monthly Bituminous Material Index" is **less** than the "Basic Bituminous Material Index" and varies 5% or more.

Payment adjustment, for bituminous material used after the expiration of the allocated working time and where the "Monthly Bituminous Material Index" **exceeds** the "Basic Bituminous Material Index", will **not** be made until after the contract records have been approved by Final Records (FR)/Materials & Tests (MT) and a Final Estimate is ready to be processed. Upon contract record approval by FR/MT, payment adjustments for bituminous material shall be calculated for each month where the allocated working time has expired, the "Monthly Bituminous Material Index" **exceeds** the "Basic Bituminous Material Index", and the indices vary 5% or more. The calculation of the bituminous payment adjustment shall be made using the "Monthly Bituminous Material Index" or the "Bituminous Material Index for Contract Completion Date" in accordance with the following formulas:

The "Bituminous Material Index for Contract Completion Date" is the Monthly Bituminous Material Index in effect on the allocated Contract Completion Date or on the completion date as extended by Change Order.

The "Monthly Bituminous Material Index" is **less** than the "Bituminous Material Index for Contract Completion Date".

PA = [Ic - Ib] x T

The "Monthly Bituminous Material Index" is **greater** than the "Bituminous Material Index for Contract Completion Date".

PA = [Icd - Ib] x T

Where:

PA =	Price Adjustment for Adjustment Month
Ib =	Basic Bituminous Material Index
Ic =	Monthly Bituminous Material Index
Icd =	Bituminous Material Index for Contract Completion Date (or as extended by Change Order)
T =	Tons

Mixes Containing Recycled Bituminous Material

The quantity of virgin asphalt cement in tons subject to payment adjustment in recycled mixes shall be the product of the total tons of each mix multiplied by the difference between (1) the percent of asphalt cement specified for bidding purposes and (2) the percent of asphalt cement obtained from the recycled asphaltic material (RAP) used in each mix. No payment adjustment under this special provision for increases and decreases in the contractor's cost for virgin asphalt cement in recycled mixes will be allowed for asphalt cement content in excess of the percent specified for bidding purposes, as all payment adjustments for asphalt cement in the

mix design of recycled mixes in excess of the percent of asphalt cement specified for bidding purposes will be made in accordance with the Standard Specifications.

No payment adjustment for bituminous material containing RAP shall be made unless the "Monthly Bituminous Material Index" varies 5% or more from the "Basic Bituminous Material Index" indicated in this Special Provision.

Where the price index varies 5% or more, the payment adjustment will be made as follows:

$$PA = [Ic - Ib] \times \frac{[BA - RA]}{100} \times Tm$$

PA =	Price Adjustment for Adjustment Month
Ib =	Basic Bituminous Material Index
Ic =	Monthly Bituminous Material Index
BA =	Percent asphalt specified for bidding purposes
RA =	Percent asphalt obtained from recycled asphaltic material used in each mix
Tm =	Tons asphalt mix for adjustment month

Upon the expiration of the allocated working time, as set forth in the original contract or as extended by Change Order, payment adjustments for bituminous material containing RAP will continue to be made only when the "Monthly Bituminous Material Index" is **less** than the "Basic Bituminous Material Index" and varies 5% or more.

Payment adjustment, for bituminous material containing RAP provided after the expiration of the allocated working time and where the "Monthly Bituminous Material Index" **exceeds** the "Basic Bituminous Material Index", shall **not** be made until after the contract records have been approved by Final Records (FR)/Materials & Tests (MT) and a Final Estimate is ready to be processed. Upon contract record approval by FR/MT, payment adjustments for bituminous material containing RAP shall be calculated for each month where the allocated working time has expired, the "Monthly Bituminous Material Index" **exceeds** the "Basic Bituminous Material Index", and the indices vary 5% or more. The calculation of the bituminous payment adjustment shall be made using the "Monthly Bituminous Material Index" or the "Bituminous Material Index for Contract Completion Date" in accordance with the following formulas:

The "Bituminous Material Index for Contract Completion Date" is the Monthly Bituminous Material Index in effect on the allocated Contract Completion Date or on the completion date as extended by Change Order.

The "Monthly Bituminous Material Index" is **less** than the "Bituminous Material Index for Contract Completion Date".

$$PA = [Icd - Ib] \times \frac{[BA - RA]}{100} \times Tm$$

The "Monthly Bituminous Material Index" is **greater** than the "Bituminous Material Index for Contract Completion Date".

$$PA = [Ic - Ib] \times \frac{[BA - RA]}{100} \times Tm$$

Where:

PA =	Price Adjustment for Adjustment Month
Ib =	Basic Bituminous Material Index
Ic =	Monthly Bituminous Material Index
Icd =	Bituminous Material Index for Contract Completion Date (or as extended by Change Order)
BA =	Percent asphalt specified for bidding purposes
RA =	Percent asphalt obtained from recycled asphaltic material used in each mix
Tm =	Tons asphalt mix for adjustment month

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

March 1, 2006

(Rev. 2-10-97) GAN

SPECIAL PROVISION

REGARDING

BITUMINOUS PLANT MIX MATERIALS TRANSFER DEVICE (MTD)

A Material Transfer Device (MTD) capable of unloading a truck or trailer load of hot mix asphalt without moving the truck shall be utilized when placing all asphalt mixes, including shoulder mixes, with the exception that it shall not be required when placing "CS" Mix. The MTD shall have a minimum storage capacity of 13.6 metric tons(15 tons.) It shall be equipped with mixing augers in the bottom of the storage hopper, capable of remixing or reblending the material as the material is removed from the storage hopper. Mixing augers shall be operational and utilized at all times during placement of the asphalt mixes. The MTD will have a rear discharge conveyor that swivels a minimum of 150° to allow feeding the paving machine from the front, side or rear.

The paver being fed by the MTD shall have a stationary surge hopper inserted into the paving hopper. The stationary surge hopper shall be considered as part of the MTD and shall have sloping sides (minimum of 60° from horizontal) and a minimum storage capacity of 13.6 metric tons(15 tons).

No direct payment will be made for the MTD and all cost of furnishing and/or operation of this equipment will be included in other items.

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

(Rev. 12-01-02) March 1, 2006
(Rev. 02-01-07)
(Rev. 10-20-07)
(Rev. 05-11-2010)

SPECIAL PROVISION

REGARDING

SECTION 411 – ASPHALTIC CONCRETE SURFACE (HOT MIX)

This provision sets up pavement smoothness requirements and how testing procedures, acceptance, and payment practices, will be handled by the Department.

Completed pavement surfaces of traffic lanes, including those on bridge deck surfaces on both the mainline and ramps between freeways that do not have stop or yield conditions shall be tested for smoothness with the Road Profiler in accordance with Department procedures.

For projects on all interstates and controlled access freeways that require the placement of BM or BM2 as a binder layer, the binder layer shall be tested for smoothness as soon as practicable after placement of the binder layer but prior to the placement of the final wearing surface. The binder layer shall have a maximum HCIRI of 60 in./mi. Any lot, or fraction thereof, of the binder layer that is greater than 60 in./mi. shall be corrected prior to placement of the final surface mix. Ramps with posted speeds less than 45 MPH shall be excluded. All corrective action shall be approved by the Engineer and shall be completed at the Contractors expense including, but not limited to, grinding and asphalt leveling.

The Contractor shall be paid monies due for items in the surface mix based on the payment table below. Any lot (one mile or fraction thereof) of pavement where the Road Profiler's Half Car International Roughness Index value exceeds 70 inches per mile, as shown in the payment table below, will require corrective action. Any unacceptable lot(s) will be divided into 0.1-mile sub-lots for closer evaluation. The Contractor, at his discretion, shall choose those sub-lots, within the unacceptable lot, to correct in order to bring the overall lot into the acceptable smoothness range. However, the Contractor may not choose more than 3 sub-lots for repair, unless they are adjacent to each other and there are no more than 6 transverse joints. Otherwise, the entire lot will require corrective action. The minimum corrective action shall be the length of the entire sub-lot of 0.1 mile. The only acceptable corrective action is mill and inlay. Payment for the corrected one mile lot(s) will be based on the Road Profiler's Half Car International Roughness Index after corrective action has been taken.

Each lot of pavement will be tested by one pass of the Road Profiler. If corrective action is required, a second pass will then be made to determine the payment for the corrected lot(s).

Payment table for smoothness based on Road Profiler Half Car International Roughness Index values

SPECIFICATION 411B			
Road Profiler Value Half Car IRI (IN/MI)	Percentage paid on bid price of surface items	Road Profiler Value Half Car IRI (IN/MI)	Percentage paid on bid price of surface items
Less than 25	110%	48	97%
25	110%	49	96%
26	109%	50	95%
27	108%	51	94%
28	107%	52	93%
29	106%	53	92%
30	105%	54	91%
31	104%	55	90%
32	103%	56	88%
33	102%	57	86%
34	101%	58	84%
35	100%	59	82%
36	100%	60	80%
37	100%	61	77%
38	100%	62	74%
39	100%	63	71%
40	100%	64	68%
41	100%	65	65%
42	100%	66	61%
43	100%	67	57%
44	100%	68	53%
45	100%	69	49%
46	99%	70	45%
47	98%	Greater than 70	Mill and Inlay*

* The mill and inlay shall be the thickness as specified on the plans for the surface layer.

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

Rev. 04-08-2010 MW
Rev. April 8, 2010

March 1, 2006

SPECIAL PROVISION

REGARDING

BITUMINOUS PLANT MIX (HOT MIX) OPEN-GRADED FRICTION COURSE

Description: This specification covers the requirements for the placement of an Open Graded Friction Course (OGFC). The work shall consist of the design and construction of an Asphalt Concrete surface in accordance with Sections 407, 411, and 903 of the Specifications. All requirements for the Asphalt Concrete surface (Hot-mix) Grading D in Sections 407, 411, and 903 shall apply to this item except as revised herein.

Material: All OGFC designs shall follow NAPA Publication, "*Design, Construction and Maintenance of Open-Graded Friction Courses*" published in 2002 except where modified here in. The OGFC shall be designed utilizing a Marshall compaction hammer at 50 blows. The contractor shall formulate and submit a job mix formula that satisfies the general design limits in Table-1 Mixture Requirements.

Coarse Aggregate: Coarse aggregates, materials retained above the #4 sieve, shall be virgin and from approved sources and shall meet all the requirements of **Subsection 903.11(a)**. A minimum of 75% of coarse aggregates shall meet the requirements of **Subsection 903.11(c)**. The coarse aggregate shall have at least 90% crushed aggregate with 2 fractured faces and 100% with one fractured face as determined by ASTM D 5821. The coarse aggregate shall have a LA Abrasion value less than 30% and a maximum absorption of 3.0%.

Stabilizing Additive Material: The stabilizing additive shall conform to AASHTO M 325, Section 8. Fiber pellets shall not be used. Slag Wool Fiber or Cellulose Fiber shall be blown into the asphalt plant measured by a flow meter or sensing device that is accurate to within ±10% of the amount required. For Batch Plants, fibers shall be added in to pugmill or weigh hopper. For drum plants, the fiber line shall be placed one foot upstream of the asphalt binder line so that the fibers are captured by the asphalt binder before being exposed to high-velocity gases in the drum. The minimum additive for a slag wool fiber shall be 0.4% and the minimum for a cellulose fiber shall be 0.3%. .

Performance Graded Asphalt Cement: The Performance Graded Asphalt Cement shall be of the type specified and shall meet TDOT specification **Subsection 904.01**.

Production: The temperature of the OGFC mix shall not exceed 350º F at any time during production.

Placement: A Material Transfer Device (MTD) capable of unloading a truck or trailer load of hot mix asphalt without moving the truck shall be utilized when placing OGFC. Haul trucks shall be thoroughly coated with a TDOT Qualified Product List(QPL) approved release agent, such that there are no puddles in the truck bed.

Revise Subsection 407.09-Weather Limitations to read as follows:

The OGFC shall be placed only when the pavement surface temperature and the ambient air temperature are a minimum 55° F and rising. OGFC will not be placed during foggy or rainy conditions. The placement of OGFC shall be limited to the period from April 1 to November 1.

Compaction: Compaction of the wearing course shall consist of a minimum of two passes with a steel double drum asphalt roller with minimum weight of 10 tons, before the material temperature has fallen below 185º F. At no time shall the rollers be allowed to remain stationary on the freshly placed asphalt concrete. Rollers shall be equipped with functioning water system and scrapers to prevent adhesion of the fresh mix onto the roller drums. A minimum of two roller units shall be supplied so the compaction will be accomplished promptly following the placement of the material. The breakdown roller should be within 50 feet of the paver. A release agent (added to the water system) may be required to prevent adhesion of the fresh mix to the roller drum and wheels. At no time shall a pneumatic tire roller be used or a steel wheel roller be used in vibratory mode. If the roller begins to break the aggregate, the contractor shall stop rolling immediately. No in place density readings will be required for acceptance.

Method of Measurement: As per **Subsection 411.09**, the accepted quantities of Open Graded Friction Course shall be paid for at the respective contract unit price per ton for Mineral Aggregate and Asphalt Cement. The addition of a stabilizing additive material (fiber) shall be included in the cost of the Asphalt Cement.

Basis of Payment: As per **Subsection 411.10**, the unit price per ton shall include all labor, materials and equipment necessary to complete the work. For bidding purposes, the target binder content of the OGFC shall be 6.0%

Table 1 – Mixture Requirements
Composition by percent weight

Sieve Size	Percent Passing	Production Tolerances
¾ in.	100	-
½ in.	85 – 100	±4.0%
3/8 in.	55 – 75	±4.0%
#4	10 – 25	±4.0%
#8	5 – 10	±3.0%
#30	-	-
#50	-	-
#100	-	-
#200	2 - 4	±2.0%
Asphalt Cement	5.06.0% Minimum	±0.25%
Air Voids	20% Minimum	
Stabilizing Additive	0.30% or .040%	
$VCA_{DRC} > VCA_{MIX}$		
Moisture Susceptibility	80% Minimum	
Cantabro Test	Unaged 20% Maximum	
Draindown	<0.3%	

If during production, the OGFC gradation or asphalt content fall outside of the tolerances that are listed in the table, the contractor shall stop production and correct the problem. Then the contractor shall be limited to 100 tons production until gradation and asphalt content are inside the production tolerances listed above. Mixture placed that is out of tolerance, may be required to be removed and replaced at the Contractors expense.

Revise Subsection 407.03-Composition of Mixtures. Section (C) to read as follows:

(C) Job Mix Formula:

1. General:

   At least 21 working days prior to the scheduled start of production of any asphalt paving mixture, the Contractor shall submit in writing in duplicate a proposed Job Mix Formula and Laboratory Design. The mix shall be designed according to NAPA Publication, "*Design, Construction and Maintenance of Open-Graded Friction Courses*" published in **2002.** Design specimens shall be compacted with 50 blows of a Marshall compaction hammer and the optimum asphalt content and mixture volumetrics shall be determined at that compaction level. If the specification requirements are not met, it will be necessary to make adjustments to the aggregate types and proportions. If requested, the Department will assist the contractor with the design process. In addition the Contractor shall submit to the Engineer for approval an asphalt barge certification with temperature-viscosity curve for each mixture. A sample of each material to be used in the mix shall be delivered to the location designated by the Engineer.

   The following information shall be furnished:

   a. The specific project on which the mixture will be used.
   b. The source and description of all materials to be used in the mix.
   c. The gradations and approximate proportions of the raw materials as intended to be combined in the paving mixture.
   d. A single percentage of the combined mineral aggregate passing each specified sieve. The combined aggregate gradation shall be plotted on a gradation chart with sieve sizes raised to the 0.45 power to assure a well graded mix.
   e. The Loss on Ignition (L.O.I.) results on the combined aggregate.
   f. The Bulk Specific Gravity, Apparent Specific Gravity and absorption on the combined mineral aggregate in the paving mixture (AASHTO T 84 and T 85)
   g. The fractured face count (ASTM D 5821) and glassy particle count of the plus No. 4 material, if applicable.
   h. A single percentage of asphalt by weight of total mix intended to be incorporated in the completed mixture.
   i. The dosage rate and source of anti-stripping additive, if required, meeting the requirements of Section 918.09 (B), to be added to the asphalt.
   j. The maximum specific gravity of the asphalt mixture (AASHTO T 209).
   k. A single temperature at which the mixture is intended to be discharged from the plant.
   l. Evidence that the completed mixture will conform to all specified physical requirements established herein.
   m. The tensile strength ratio (TSR) indicating the stripping and moisture susceptibility characteristics of the mix.

n. In order to identify critical mixes and make appropriate adjustments, the mix design should have the required design properties for the bitumen content range of Optimum Asphalt Cement ± 0.25%.
o. The dosage rate and source of stabilizing additive, meeting the requirements of AASHTO M 325, that is sufficient to prevent draindown at plant production temperatures.
p. Draindown sensitivity results, in accordance with AASHTO T 305 at the anticipated plant production temperature and shall not exceed 0.30%.

The temperature shown on the Job Mix Formula shall be the optimum mixing temperature as shown on the temperature-viscosity curve. The mixing temperature of Polymer or Latex Modified Asphalt mixes shall not exceed 350 degrees F.
The Laboratory Design must be prepared and signed by a Certified Laboratory Technician. To be certified, the technician must have completed the TDOT Mix Design Workshop School conducted by the Department, including the written and lab performance testing.

2. Revision of Job Mix Formula:

The approved job mix formula shall remain in effect until a change is authorized in writing by the Engineer. The Contractor, at any time after construction has started, may request that the job mix formula be revised, providing evidence is shown that the revision is necessary and the revised aggregate gradation will meet all applicable gradation requirements.

A new design will be required for any change in source of materials. All requests for design mix adjustments, redesigns and new design mixes will be submitted in writing to the Engineer for approval.

S T A T E **O F** **T E N N E S S E E**
(Rev. 12-12-2011) March 1, 2006
(Rev. 08-15-2012)
(Rev. 01-07-2013)

SPECIAL PROVISION

REGARDING

BITUMINOUS PLANT MIX (HOT MIX) THIN LIFT FRICTION COURSE

Description: This specification covers the requirements for the placement of a thin lift hot mix overlay. The work shall consist of the design and construction of an Asphalt Concrete surface in accordance with Sections 407, 411, and 903 of the Specifications.

Aggregate: Aggregate shall meet the requirements of Section 903.11 of the Standard Specifications. A minimum of 75% of the aggregate shall be crushed to meet the requirements of **Subsection 903.11(c) Grading D** for the appropriate traffic level. When the thin lift mix is to be used as an intermediate course, the siliceous content requirement shall not apply.

Mixture Design Requirements: The mixture shall be designed in accordance with section 407.03 of the Standard Specifications except as stated below. The combined gradation shall meet the following:

Composition by percent weight

Sieve Size	Percent Passing (% weight)
1/2 in.	100
3/8 in.	100
#4	89 - 94
#8	53 - 77
#30	23 - 42
#50	-
#100	9 – 18
#200	6 - 14
Asphalt Cement	5.7% - 7.5%
Design Air Voids	4.0% ± 0.2%
Production Air Voids	3 - 5.5%
Stability	2,000 lbs.
Dust/Asphalt	1.0- 2.0
VMA	16 min.
Tensile Strength Ratio	Per specification section 407.03

The mixture shall contain a maximum of 15% natural sands and a maximum of 15% Recycled Asphalt Pavement (RAP). All RAP shall be processed for consistency such that all RAP passes the 5/16" screen.

Weather Limitations: The thin lift mixture shall be placed only when the pavement surface temperature and the ambient air temperature are a minimum 55° F and rising. The placement of the thin lift mixture shall be limited to the period from April 1 to November 1.

Compaction and Density: A minimum of 2 rollers meeting the requirements of section 407.07 will be required. Breakdown rolling shall be performed, as soon as possible and while the mixture is sufficiently hot, by a pneumatic tire roller having a minimum contact pressure of 85 psi (585 kPa). A combination roller may be substituted for a pneumatic roller. The paver speed shall be regulated so rollers can maintain proper compaction of the mixture as determined by the Engineer.

Method of Measurement: The accepted quantities of thin lift mixture shall be paid for at the respective contract unit price per ton. For bidding purposes, the asphalt cement content for thin lift hot mix shall be 6.3%.

Basis of Payment: The unit price per ton shall include all labor, materials and equipment necessary to complete the work. Mixture acceptance shall be in accordance with section 407.20.

Item Number	Description	Unit
411-03.05	ACS MIX (PG64-22) THIN LIFT CS ASPHALT	S.Y.
411-03.07	ACS MIX (PG64-22) THIN LIFT CS ASPHALT	TON
411-03.08	ACS MIX (PG70-22) THIN LIFT CS ASPHALT	TON
411-03.09	ACS MIX (PG76-22) THIN LIFT CS ASPHALT	TON

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

October 9, 2014

SPECIAL PROVISION

REGARDING

TRAFFIC QUEUE PROTECTION

Description: When construction activities are performed on control-access or limited access facilities, the Contractor shall pursue efforts for the protection of traffic queues caused by project operations and clearly demonstrate adequate good faith efforts as described herein. The queue protection truck is expected to alert motorists (inside or outside of project limits) of all stopped traffic caused by construction activities or incidents within the project limits.

Equipment: The contractor shall provide a minimum of one (1) queue protection truck for each traveling direction where traffic flow is reduced. One (1) additional queue protection truck shall be onsite in reserve. The system deployed must fulfill the following minimum requirements:

1. A truck mounted attenuator that meets or exceeds NCHRP TL-3 requirements.
2. Four (4) round yellow strobe lights (with auto-dimmers) positioned rear facing
    - Two (2) mounted under rear bumper
    - Two (2) mounted at cab level
3. One (1) standard cab mounted light bar.
4. A truck mounted message board with a minimum of 3 Lines and 8 Characters per line.
5. Four Hour National Traffic Incident Management (TIM) Responder Training for Queue Truck Operators.

Maintenance of Traffic: The following procedures will be followed until free flow traffic conditions are present:

- The queue protection truck shall be positioned no further than ½ mile upstream from the back of the slow moving traffic.
- The queue protection truck shall be positioned on the shoulder and clear of the traveled way so as not to impede traffic.
- The queue protection truck shall relocate as needed to maintain the minimum ½ mile distance from the back of the slow moving traffic.

- The 2nd queue protection truck shall be held in reserve, on site, and support the primary truck if conditions prevent repositioning by reverse. This truck shall not be paid for idle time.
- Trucks shall be kept in project limits during planned lane closures and other project activities expected to cause a queue.
- Queue length estimates and traffic conditions shall be reported to the TDOT District Operations Supervisor or designee at the following periods:
    1. At 30 minute intervals
    2. At significant changes
    3. When free flow traffic is achievedWhen free flow traffic is achieved

The queue protection truck shall be mobilized as directed by the District Operations Supervisor or designee and shall be de-mobilized when free flow conditions are reached.

Basis of Payment: The queue protection truck, all related equipment, and labor shall be paid for as Item No. 712-08.10, per hour. All costs are to be included in the price bid. Idle time shall not be paid.

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 an 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 arid 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 though 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**

Revised 10-19-2012 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:

County	Goals for Female Participation in each Trade
All Counties	6.9

County	Goals for Minority Participation for each Trade
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

County	Goals for Minority Participation for each Trade
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 through- out 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:

U.S. Department of Labor – Regional Office
Office of Federal Contract Compliance Program
61 Forsyth Street, Room 7B75
Atlanta, GA 30303

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.

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

(Rev. 06-01-03) March 1, 2006
(Rev. 06-23-08)
(Rev. 11-10-08)

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.

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

(Rev. 12-01-06) March 1, 2006
(Rev. 11-10-08)
(Rev. 9-17-11)

SPECIAL PROVISION

REGARDING

DBE 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 4 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

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.

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

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.

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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.

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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.

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

I. GENERAL

1. Form FHWA-1273 must be physically incorporated in each construction contract funded under Title 23 (excluding emergency contracts solely intended for debris removal). The contractor (or subcontractor) must insert this form in each subcontract and further require its inclusion in all lower tier subcontracts (excluding purchase orders, rental agreements and other agreements for supplies or services).

The applicable requirements of Form FHWA-1273 are incorporated by reference for work done under any purchase order, rental agreement or agreement for other services. The prime contractor shall be responsible for compliance by any subcontractor, lower-tier subcontractor or service provider.

Form FHWA-1273 must be included in all Federal-aid design-build contracts, in all subcontracts and in lower tier subcontracts (excluding subcontracts for design services, purchase orders, rental agreements and other agreements for supplies or services). The design-builder shall be responsible for compliance by any subcontractor, lower-tier subcontractor or service provider.

Contracting agencies may reference Form FHWA-1273 in bid proposal or request for proposal documents, however, the Form FHWA-1273 must be physically incorporated (not referenced) in all contracts, subcontracts and lower-tier subcontracts (excluding purchase orders, rental agreements and other agreements for supplies or services related to a construction contract).

2. Subject to the applicability criteria noted in the following sections, 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.

3. A breach of any of the stipulations contained in these Required Contract Provisions may be sufficient grounds for withholding of progress payments, withholding of final payment, termination of the contract, suspension / debarment or any other action determined to be appropriate by the contracting agency and FHWA.

4. Selection of Labor: During the performance of this contract, the contractor shall not use convict labor for any purpose within the limits of a construction project on a Federal-aid highway unless it is labor performed by convicts who are on parole, supervised release, or probation. The term Federal-aid highway does not include roadways functionally classified as local roads or rural minor collectors.

II. NONDISCRIMINATION

The provisions of this section related to 23 CFR Part 230 are applicable to all Federal-aid construction contracts and to all related construction subcontracts of $10,000 or more. The provisions of 23 CFR Part 230 are not applicable to material supply, engineering, or architectural service contracts.

In addition, the contractor and all subcontractors must comply with the following policies: Executive Order 11246, 41 CFR 60, 29 CFR 1625-1627, Title 23 USC Section 140, the Rehabilitation Act of 1973, as amended (29 USC 794), Title VI of the Civil Rights Act of 1964, as amended, and related regulations including 49 CFR Parts 21, 26 and 27; and 23 CFR Parts 200, 230, and 633.

The contractor and all subcontractors must comply with: the requirements of the Equal Opportunity Clause in 41 CFR 60-1.4(b) and, for all construction contracts exceeding $10,000, the Standard Federal Equal Employment Opportunity Construction Contract Specifications in 41 CFR 60-4.3.

Note: The U.S. Department of Labor has exclusive authority to determine compliance with Executive Order 11246 and the policies of the Secretary of Labor including 41 CFR 60, and 29 CFR 1625-1627. The contracting agency and the FHWA have the authority and the responsibility to ensure compliance with Title 23 USC Section 140, the Rehabilitation Act of 1973, as amended (29 USC 794), and Title VI of the Civil Rights Act of 1964, as amended, and related regulations including 49 CFR Parts 21, 26 and 27; and 23 CFR Parts 200, 230, and 633.

The following provision is adopted from 23 CFR 230, Appendix A, with appropriate revisions to conform to the U.S. Department of Labor (US DOL) and FHWA requirements.

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, 29 CFR 1625-1627, 41 CFR 60 and 49 CFR 27) 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 provisions of the Americans with 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 contracting agency and the Federal Government to ensure that it has made every good faith effort to provide equal opportunity with respect to all of its terms and conditions of employment and in their review of activities under the contract.

b. The contractor will accept as its 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, pre-apprenticeship, and/or on-the-job training."

2. EEO Officer: The contractor will designate and make known to the contracting officers an EEO Officer who will have the responsibility for and must be capable of effectively administering and promoting an active EEO program 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 minorities and women.

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 minorities and women 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 minorities and women. To meet this requirement, the contractor will identify sources of potential minority group employees, and establish with such identified sources procedures whereby minority and women 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, the contractor is expected to observe the provisions of that agreement to the extent that the system meets the contractor's compliance with EEO contract provisions. Where implementation of such an agreement has the effect of discriminating against minorities or women, or obligates the contractor to do the same, such implementation violates Federal nondiscrimination provisions.

c. The contractor will encourage its present employees to refer minorities and women as applicants for employment. Information and procedures with regard to referring such 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 its 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 their avenues of appeal.

6. Training and Promotion:

a. The contractor will assist in locating, qualifying, and increasing the skills of minorities and women who are

applicants for employment or current employees. Such efforts should be aimed at developing full journey level status employees in the type of trade or job classification involved.

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. In the event a special provision for training is provided under this contract, this subparagraph will be superseded as indicated in the special provision. The contracting agency may reserve training positions for persons who receive welfare assistance in accordance with 23 U.S.C. 140(a).

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 employees who are minorities and women 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 good faith efforts to obtain the cooperation of such unions to increase opportunities for minorities and women. 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 good faith efforts to develop, in cooperation with the unions, joint training programs aimed toward qualifying more minorities and women for membership in the unions and increasing the skills of minorities and women so that they may qualify for higher paying employment.

b. The contractor will use good faith 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 contracting agency 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 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 minorities and women. The failure of a union to provide sufficient referrals (even though it is obligated to provide exclusive referrals under the terms of a collective bargaining agreement) does not relieve the contractor from the requirements of this paragraph. 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 contracting agency.

8. Reasonable Accommodation for Applicants / Employees with Disabilities: The contractor must be familiar with the requirements for and comply with the Americans with Disabilities Act and all rules and regulations established there under. Employers must provide reasonable accommodation in all employment activities unless to do so would cause an undue hardship.

9. 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. The contractor shall take all necessary and reasonable steps to ensure nondiscrimination in the administration of this contract.

a. The contractor shall notify all potential subcontractors and suppliers and lessors of their EEO obligations under this contract.

b. The contractor will use good faith efforts to ensure subcontractor compliance with their EEO obligations.

10. Assurance Required by 49 CFR 26.13(b):

a. The requirements of 49 CFR Part 26 and the State DOT's U.S. DOT-approved DBE program are incorporated by reference.

b. The contractor 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 DOT-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 contracting agency deems appropriate.

11. 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 the date of the final payment to the contractor for all contract work and shall be available at reasonable times and places for inspection by authorized representatives of the contracting agency and the FHWA.

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

(1) The number and work hours 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; and

(3) The progress and efforts being made in locating, hiring, training, qualifying, and upgrading minorities and women;

b. The contractors and subcontractors will submit an annual report to the contracting agency 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. The staffing data should represent the project work force on board in all or any part of the last payroll period preceding the end of July. If on-the-job training is being required by special provision, the contractor

will be required to collect and report training data. The employment data should reflect the work force on board during all or any part of the last payroll period preceding the end of July.

III. NONSEGREGATED FACILITIES

This provision is applicable to all Federal-aid construction contracts and to all related construction subcontracts of $10,000 or more.

The contractor must ensure that facilities provided for employees are provided in such a manner that segregation on the basis of race, color, religion, sex, or national origin cannot result. The contractor may neither require such segregated use by written or oral policies nor tolerate such use by employee custom. The contractor's obligation extends further to ensure that its employees are not assigned to perform their services at any location, under the contractor's control, where the facilities are segregated. The term "facilities" includes waiting rooms, work areas, restaurants and other eating areas, time clocks, restrooms, washrooms, locker rooms, and other storage or dressing areas, parking lots, drinking fountains, recreation or entertainment areas, transportation, and housing provided for employees. The contractor shall provide separate or single-user restrooms and necessary dressing or sleeping areas to assure privacy between sexes.

IV. DAVIS-BACON AND RELATED ACT PROVISIONS

This section is applicable to all Federal-aid construction projects exceeding $2,000 and to all related subcontracts and lower-tier subcontracts (regardless of subcontract size). The requirements apply to all projects located within the right-of-way of a roadway that is functionally classified as Federal-aid highway. This excludes roadways functionally classified as local roads or rural minor collectors, which are exempt. Contracting agencies may elect to apply these requirements to other projects.

The following provisions are from the U.S. Department of Labor regulations in 29 CFR 5.5 “Contract provisions and related matters” with minor revisions to conform to the FHWA-1273 format and FHWA program requirements.

1. Minimum wages

a. All laborers and mechanics 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 issued by the Secretary of Labor under the Copeland Act (29 CFR part 3)), the full amount of wages and bona fide fringe benefits (or cash equivalents thereof) due at time of payment computed at rates not less than those contained in the wage determination of the Secretary of Labor which is attached hereto and made a part hereof, regardless of any contractual relationship which may be alleged to exist between the contractor and such laborers and mechanics.

Contributions made or costs reasonably anticipated for bona fide fringe benefits under section 1(b)(2) of the Davis-Bacon Act on behalf of laborers or mechanics are considered wages paid to such laborers or mechanics, subject to the provisions of paragraph 1.d. of this section; also, 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 29 CFR 5.5(a)(4). 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. The wage determination (including any additional classification and wage rates conformed under paragraph 1.b. of this section) and the Davis-Bacon poster (WH–1321) 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.

b.(1) The contracting officer shall require that any class of laborers or mechanics, including helpers, which is not listed in the wage determination and which is to be employed under the contract shall be classified in conformance with the wage determination. The contracting officer shall approve an additional classification and wage rate and fringe benefits therefore only when the following criteria have been met:

(i) The work to be performed by the classification requested is not performed by a classification in the wage determination; and

(ii) The classification is utilized in the area by the construction industry; and

(iii) The proposed wage rate, including any bona fide fringe benefits, bears a reasonable relationship to the wage rates contained in the wage determination.

(2) If the contractor and the laborers and mechanics to be employed in the classification (if known), 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 Administrator of the Wage and Hour Division, Employment Standards Administration, U.S. Department of Labor, Washington, DC 20210. The 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.

(3) In the event the contractor, the laborers or mechanics to be employed in the 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. The Wage and Hour 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.

(4) The wage rate (including fringe benefits where appropriate) determined pursuant to paragraphs 1.b.(2) or 1.b.(3) of this section, shall be paid to all workers performing work in the classification under this contract from the first day on which work is performed in the classification.

c. 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 shall either pay the benefit as stated in the wage determination or shall pay another bona fide fringe benefit or an hourly cash equivalent thereof.

d. If the contractor does not make payments to a trustee or other third person, the contractor may consider as 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.

2. Withholding

The contracting agency shall upon its own action or upon written request of an authorized representative of the Department of Labor, withhold or cause to be withheld from the contractor 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, so 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 contracting agency 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.

3. Payrolls and basic records

a. Payrolls and basic records relating thereto shall be maintained by the contractor during the course of the work and preserved for a period of three years thereafter for all laborers and mechanics working at the site of the work. Such records shall contain the name, address, and social security number of each such worker, his or her correct classification, hourly rates of wages paid (including rates of contributions or costs anticipated for bona fide fringe benefits or cash equivalents thereof of 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. Whenever the Secretary of Labor has found under 29 CFR 5.5(a)(1)(iv) 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 shall maintain records which show that the commitment to provide such benefits is enforceable, that the plan or program is financially responsible, and that the plan or program has been communicated in writing to the laborers or mechanics affected, and records which show the costs anticipated or the actual cost incurred in providing such benefits. Contractors employing apprentices or trainees under approved programs shall maintain written evidence of the registration of apprenticeship programs and certification of trainee programs, the registration of the apprentices and trainees, and the ratios and wage rates prescribed in the applicable programs.

b.(1) The contractor shall submit weekly for each week in which any contract work is performed a copy of all payrolls to the contracting agency. The payrolls submitted shall set out accurately and completely all of the information required to be maintained under 29 CFR 5.5(a)(3)(i), except that full social security numbers and home addresses shall not be included on weekly transmittals. Instead the payrolls shall only need to include an individually identifying number for each employee (e.g. , the last four digits of the employee's social security number). The required weekly payroll information may be submitted in any form desired. Optional Form WH–347 is available for this purpose from the Wage and Hour Division Web site at http://www.dol.gov/esa/whd/forms/wh347instr.htm or its successor site. The prime contractor is responsible for the submission of copies of payrolls by all subcontractors. Contractors and subcontractors shall maintain the full social security number and current address of each covered worker, and shall provide them upon request to the contracting agency for transmission to the State DOT, the FHWA or the Wage and Hour Division of the Department of Labor for purposes of an investigation or audit of compliance with prevailing wage requirements. It is not a violation of this section for a prime contractor to require a subcontractor to provide addresses and social security numbers to the prime contractor for its own records, without weekly submission to the contracting agency..

(2) Each payroll submitted shall be accompanied by a "Statement of Compliance," signed by the contractor or subcontractor or his or her agent who pays or supervises the payment of the persons employed under the contract and shall certify the following:

(i) That the payroll for the payroll period contains the information required to be provided under §5.5 (a)(3)(ii) of Regulations, 29 CFR part 5, the appropriate information is being maintained under §5.5 (a)(3)(i) of Regulations, 29 CFR part 5, and that such information is correct and complete;

(ii) That each 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 Regulations, 29 CFR part 3;

(iii) That each laborer or mechanic has been paid not less than the applicable wage rates and fringe benefits or cash equivalents for the classification of work performed, as specified in the applicable wage determination incorporated into the contract.

(3) 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 3.b.(2) of this section.

(4) The falsification of any of the above certifications may subject the contractor or subcontractor to civil or criminal prosecution under section 1001 of title 18 and section 231 of title 31 of the United States Code.

c. The contractor or subcontractor shall make the records required under paragraph 3.a. of this section available for inspection, copying, or transcription by authorized representatives of the contracting agency, the State DOT, the FHWA, or the Department of Labor, 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 FHWA may, after written notice to the contractor, the contracting agency or the State DOT, take such action 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.

4. Apprentices and trainees

a. Apprentices (programs of the USDOL).

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 U.S. Department of Labor, Employment and Training Administration, Office of Apprenticeship Training, Employer and Labor Services, or with a State Apprenticeship Agency recognized by the Office, or if a person is employed in his or 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 Office of Apprenticeship Training, Employer and Labor Services or a State Apprenticeship Agency (where appropriate) to be eligible for probationary employment as an apprentice.

The allowable ratio of apprentices to journeymen 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 worker 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 on 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 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's hourly rate) specified in the contractor's or subcontractor's registered program shall be observed.

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 journeymen 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 determines that a different practice prevails for the applicable apprentice classification, fringes shall be paid in accordance with that determination.

In the event the Office of Apprenticeship Training, Employer and Labor Services, or a State Apprenticeship Agency recognized by the Office, withdraws approval of an apprenticeship program, the contractor will no longer be permitted to utilize apprentices at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

b. Trainees (programs of the USDOL).

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 U.S. Department of Labor, Employment and Training Administration.

The ratio of trainees to journeymen on the job site shall not be greater than permitted under the plan approved by the Employment and Training Administration.

Every trainee must be paid at not less than the rate specified in the approved program for the trainee's level of progress, expressed as a percentage of the journeyman 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 wage rate on the wage determination which provides for less than full fringe benefits for apprentices. 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.

In the event the Employment and Training Administration withdraws approval of a training program, the contractor 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. Equal employment opportunity. The utilization of apprentices, trainees and journeymen under this part shall be in conformity with the equal employment opportunity requirements of Executive Order 11246, as amended, and 29 CFR part 30.

d. 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.

5. Compliance with Copeland Act requirements. The contractor shall comply with the requirements of 29 CFR part 3, which are incorporated by reference in this contract.

6. Subcontracts. The contractor or subcontractor shall insert Form FHWA-1273 in any subcontracts and also require the subcontractors to include Form FHWA-1273 in any lower tier subcontracts. The prime contractor shall be responsible for the compliance by any subcontractor or lower tier subcontractor with all the contract clauses in 29 CFR 5.5.

7. Contract termination: debarment. A breach of the contract clauses in 29 CFR 5.5 may be grounds for termination of the contract, and for debarment as a contractor and a subcontractor as provided in 29 CFR 5.12.

8. Compliance with Davis-Bacon and Related Act requirements. All rulings and interpretations of the Davis-Bacon and Related Acts contained in 29 CFR parts 1, 3, and 5 are herein incorporated by reference in this contract.

9. Disputes concerning labor standards. Disputes arising out of the labor standards provisions of this contract shall not be subject to the general disputes clause of this contract. Such disputes shall be resolved in accordance with the procedures of the Department of Labor set forth in 29 CFR parts 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 U.S. Department of Labor, or the employees or their representatives.

10. Certification of eligibility.

a. By entering into this contract, the contractor certifies that neither it (nor he or she) nor any person or firm who has an interest in the contractor's firm is a person or firm ineligible to be awarded Government contracts by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).

b. No part of this contract shall be subcontracted to any person or firm ineligible for award of a Government contract by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).

c. The penalty for making false statements is prescribed in the U.S. Criminal Code, 18 U.S.C. 1001.

V. CONTRACT WORK HOURS AND SAFETY STANDARDS ACT

The following clauses apply to any Federal-aid construction contract in an amount in excess of $100,000 and subject to the overtime provisions of the Contract Work Hours and Safety Standards Act. These clauses shall be inserted in addition to the clauses required by 29 CFR 5.5(a) or 29 CFR 4.6. As used in this paragraph, the terms laborers and mechanics include watchmen and guards.

1. Overtime requirements. No contractor or subcontractor contracting for any part of the contract work which may require or involve the employment of laborers or mechanics shall require or permit any such laborer or mechanic in any workweek in which he or she is employed on such work to work in excess of forty hours in such workweek unless such laborer or mechanic receives compensation at a rate not less than one and one-half times the basic rate of pay for all hours worked in excess of forty hours in such workweek.

2. Violation; liability for unpaid wages; liquidated damages. In the event of any violation of the clause set forth in paragraph (1.) of this section, the contractor and any subcontractor responsible therefor shall be liable for the 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 or mechanic, including watchmen and guards, employed in violation of the clause set forth in paragraph (1.) of this section, in the sum of $10 for each calendar day on which such individual was required or permitted to work in excess of the standard workweek of forty hours without payment of the overtime wages required by the clause set forth in paragraph (1.) of this section.

3. Withholding for unpaid wages and liquidated damages. The FHWA or the contacting agency shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld, from any moneys 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 (2.) of this section.

4. Subcontracts. The contractor or subcontractor shall insert in any subcontracts the clauses set forth in paragraph (1.) through (4.) of this section and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for compliance by any subcontractor or lower tier subcontractor with the clauses set forth in paragraphs (1.) through (4.) of this section.

VI. SUBLETTING OR ASSIGNING THE CONTRACT

This provision is applicable to all Federal-aid construction contracts on the National Highway System.

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 contracting agency. 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 635.116).

a. The term "perform work with its own organization" refers to workers employed or leased 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 or lower tier subcontractor, agents of the prime contractor, or any other assignees. The term may include payments for the costs of hiring leased employees from an employee leasing firm meeting all relevant Federal and State regulatory requirements. Leased employees may only be included in this term if the prime contractor meets all of the following conditions:

(1) the prime contractor maintains control over the supervision of the day-to-day activities of the leased employees;
(2) the prime contractor remains responsible for the quality of the work of the leased employees;
(3) the prime contractor retains all power to accept or exclude individual employees from work on the project; and
(4) the prime contractor remains ultimately responsible for the payment of predetermined minimum wages, the submission of payrolls, statements of compliance and all other Federal regulatory requirements.

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 or propose 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 VI 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 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 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 contracting agency has assured that each subcontract is evidenced in writing and that it contains all pertinent provisions and requirements of the prime contract.

5. The 30% self-performance requirement of paragraph (1) is not applicable to design-build contracts; however, contracting agencies may establish their own self-performance requirements.

VII. SAFETY: ACCIDENT PREVENTION

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts.

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 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. 3704).

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.3704).

VIII. FALSE STATEMENTS CONCERNING HIGHWAY PROJECTS

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts.

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, Form FHWA-1022 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:

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 under this title or imprisoned not more than 5 years or both."

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

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts.

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

1. That any person who is or will be utilized in the performance of this contract is not prohibited from receiving an award due to a violation of Section 508 of the Clean Water Act or Section 306 of the Clean Air Act.
2. That the contractor agrees to include or cause to be included the requirements of paragraph (1) of this Section X in every subcontract, and further agrees to take such action as the contracting agency may direct as a means of enforcing such requirements.

X. CERTIFICATION REGARDING DEBARMENT, SUSPENSION, INELIGIBILITY AND VOLUNTARY EXCLUSION

This provision is applicable to all Federal-aid construction contracts, design-build contracts, subcontracts, lower-tier subcontracts, purchase orders, lease agreements, consultant contracts or any other covered transaction requiring FHWA approval or that is estimated to cost $25,000 or more – as defined in 2 CFR Parts 180 and 1200.

1**. Instructions for Certification – First Tier Participants:**

a. By signing and submitting this proposal, the prospective first tier 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 first tier 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 first tier 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 contracting agency determined to enter into this transaction. If it is later determined that the prospective participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government, the contracting agency may terminate this transaction for cause of default.

d. The prospective first tier participant shall provide immediate written notice to the contracting agency to whom this proposal is submitted if any time the prospective first tier 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," "participant," "person," "principal," and "voluntarily excluded," as used in this clause, are defined in 2 CFR Parts 180 and 1200. “First Tier Covered Transactions” refers to any covered transaction between a grantee or subgrantee of Federal funds and a participant (such as the prime or general contract). “Lower Tier Covered Transactions” refers to any covered transaction under a First Tier Covered Transaction (such as subcontracts). “First Tier Participant” refers to the participant who has entered into a covered transaction with a grantee or subgrantee of Federal funds (such as the prime or general contractor). “Lower Tier Participant” refers any participant who has entered into a covered transaction with a First Tier Participant or other Lower Tier Participants (such as subcontractors and suppliers).

f. The prospective first 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 entering into this transaction.

g. The prospective first tier 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 Transactions," provided by the department or contracting agency, entering into this covered transaction, without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions exceeding the $25,000 threshold.

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 is responsible for ensuring that its principals are not suspended, debarred, or otherwise ineligible to participate in covered transactions. To verify the eligibility of its principals, as well as the eligibility of any lower tier prospective participants, each participant may, but is not required to, check the Excluded Parties List System website (https://www.epls.gov/), which is compiled by the General Services Administration.

i. Nothing contained in the foregoing shall be construed to require the establishment of a system of records in order to render in good faith the certification required by this clause. The knowledge and information of the prospective 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.

* * * * *

2. Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion – First Tier Participants:

a. The prospective first tier participant certifies to the best of its knowledge and belief, that it and its principals:

(1) Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participating in covered transactions by any Federal department or agency;

(2) 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;

(3) 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 (a)(2) of this certification; and

(4) 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.

b. Where the prospective 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 Participants:**

(Applicable to all subcontracts, purchase orders and other lower tier transactions requiring prior FHWA approval or estimated to cost $25,000 or more - 2 CFR Parts 180 and 1200)

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," "participant," "person," "principal," and "voluntarily excluded," as used in this clause, are defined in 2 CFR Parts 180 and 1200. You may contact the person to which this proposal is submitted for assistance in obtaining a copy of those regulations. “First Tier Covered Transactions” refers to any covered transaction between a grantee or subgrantee of Federal funds and a participant (such as the prime or general contract). “Lower Tier Covered Transactions” refers to any covered transaction under a First Tier Covered Transaction (such as subcontracts). “First Tier Participant” refers to the participant who has entered into a covered transaction with a grantee or subgrantee of Federal funds (such as the prime or general contractor). “Lower Tier Participant” refers any participant who has entered into a covered transaction with a First Tier Participant or other Lower Tier Participants (such as subcontractors and suppliers).

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 exceeding the $25,000 threshold.

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 is responsible for ensuring that its principals are not suspended, debarred, or otherwise ineligible to participate in covered transactions. To verify the eligibility of its principals, as well as the eligibility of any lower tier prospective participants, each participant may, but is not required to, check the Excluded Parties List System website (https://www.epls.gov/), which is compiled by the General Services Administration.

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 Participants:

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 participating in covered transactions 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.

* * * * *

XI. CERTIFICATION REGARDING USE OF CONTRACT FUNDS FOR LOBBYING

This provision is 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 its bid or proposal that the participant 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.

ATTACHMENT A - EMPLOYMENT AND MATERIALS PREFERENCE FOR APPALACHIAN DEVELOPMENT HIGHWAY SYSTEM OR APPALACHIAN LOCAL ACCESS ROAD CONTRACTS

This provision is applicable to all Federal-aid projects funded under the Appalachian Regional Development Act of 1965.

1. During the performance of this contract, the contractor undertaking to do work which is, or reasonably may be, done as on-site work, shall give preference to qualified persons who regularly reside in the labor area as designated by the DOL wherein the contract work is situated, or the subregion, or the Appalachian counties of the State wherein the contract work is situated, except:

a. To the extent that qualified persons regularly residing in the area are not available.

b. For the reasonable needs of the contractor to employ supervisory or specially experienced personnel necessary to assure an efficient execution of the contract work.

c. For the obligation of the contractor to offer employment to present or former employees as the result of a lawful collective bargaining contract, provided that the number of nonresident persons employed under this subparagraph (1c) shall not exceed 20 percent of the total number of employees employed by the contractor on the contract work, except as provided in subparagraph (4) below.

2. The contractor shall place a job order with the State Employment Service indicating (a) the classifications of the laborers, mechanics and other employees required to perform the contract work, (b) the number of employees required in each classification, (c) the date on which the participant estimates such employees will be required, and (d) any other pertinent information required by the State Employment Service to complete the job order form. The job order may be placed with the State Employment Service in writing or by telephone. If during the course of the contract work, the information submitted by the contractor in the original job order is substantially modified, the participant shall promptly notify the State Employment Service.

3. The contractor shall give full consideration to all qualified job applicants referred to him by the State Employment Service. The contractor is not required to grant employment to any job applicants who, in his opinion, are not qualified to perform the classification of work required.

4. If, within one week following the placing of a job order by the contractor with the State Employment Service, the State Employment Service is unable to refer any qualified job applicants to the contractor, or less than the number requested, the State Employment Service will forward a certificate to the contractor indicating the unavailability of applicants. Such certificate shall be made a part of the contractor's permanent project records. Upon receipt of this certificate, the contractor may employ persons who do not normally reside in the labor area to fill positions covered by the certificate, notwithstanding the provisions of subparagraph (1c) above.

5. The provisions of 23 CFR 633.207(e) allow the contracting agency to provide a contractual preference for the use of mineral resource materials native to the Appalachian region.

6. The contractor shall include the provisions of Sections 1 through 4 of this Attachment A in every subcontract for work which is, or reasonably may be, done as on-site work.

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

March 1, 2006

(Rev. 01-11-12)
(Rev. 01-03-13
(Rev. 01-03-14)
(Rev. 09-08-14)

SPECIAL PROVISION

REGARDING

TENNESSEE DEPARTMENT OF TRANSPORTATION

2014 MINIMUM WAGE SCALES FOR FEDERAL-AID CONSTRUCTION

& 2014 MINIMUM WAGE SCALES FOR STATE FUNDED CONSTRUCTION

This Contract contains "Tennessee Department of Transportation 2014 Minimum Wage Scales for State Funded Construction", Tennessee Department of Labor Decision No. T-40056, dated January 1, 2014, and Tennessee Department of Transportation 2014 Minimum Wage Scales for Federal-Aid Highway Construction, U. S. Department of Labor Decision No. TN140002 (dated April 4, 2014).

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. 09/08/14)

STATE OF TENNESSEE

TENNESSEE DEPARTMENT OF TRANSPORTATION

MINIMUM WAGE SCALES FOR FEDERAL AID HIGHWAY CONSTRUCTION

General Decision Number: TN140002 04/04/2014 TN2

Superseded General Decision Number: TN20130002

State: Tennessee

Construction Type: 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).

Modification Number	Publication Date
0	01/03/2014
1	03/28/2014
2	04/04/2014

* SUTN2010-002 03/24/2014

	Rates	Fringes
BRICKLAYER	$ 21.99	
CARPENTER	$ 16.85	
CEMENT MASON/CONCRETE FINISHER	$ 15.22	
ELECTRICIAN	$ 24.69	
IRONWORKER		
Reinforcing	$ 15.91	
Structural	$ 17.97	
LABORER		
Common/Unskilled	$ 12.89	
Skilled		
Air Tool Operator, Asphalt Raker, Chain Saw		

Operator, Concrete Mixer (less than 1 yd), Concrete Rubber, Edger, Fence Erector, Form Setter (steel), Guard Rail Erector, Mechanic's Tender (tire changer or oiler), Mortar Mixer, Nozzleman or Gun Operator (gunite), Pipelayer, Sign Erector.....$ 14.88

PAINTER (INCLUDES SANDBLASTER)...$ 26.23

POWER EQUIPMENT OPERATOR:

GROUP 1

Backhoe/Hydraulic Excavator (3/4 yd & over), Crane (less than 20 Tons), End Loader (3 yd & over), Motor Patrol (finish),Piledriver, Dragline.....$ 18.62

GROUP 1A

Drill Operator (Caisson)...$ 25.04

Farm Tractor Operator (Power Broom).....$ 13.21

GROUP 2

Backhoe/Hydraulic Excavator (less than 3/4 yd), Bulldozer or Push Dozer, End Loader (less than 3 yd), Motor Patrol (rough), Tractor (crawler/ utility), Truck Driver (Heavy Duty, Off Road) Scraper, Shovel, or Trenching Machine.....$ 16.51

GROUP 3

Asphalt Paver, Concrete Finishing Machine, Concrete Paver, Scale, Spreader (self-propelled), Concrete Grinder, Asphalt Milling Machine, Boring Machine (horizontal).....$ 17.10

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 and hoist),
Bituminous Distributor
Machine, pump, Track
Drill, Striping Machine....$ 16.02
Heavy Duty Mechanic.....$ 20.88
Light Duty Mechanic.....$ 17.04
Sweeping Machine (Vacuum)
Operator.....$ 15.54
GROUP 5
Crane (over 20 Tons).....$ 19.02

TRUCK DRIVER
2 axles.....$ 14.17
3-4 axles.....$ 14.33
5 or more axles.....$ 16.93

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

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Unlisted classifications needed for work not included within the scope of the classifications listed may be added after award only as provided in the labor standards contract clauses (29CFR 5.5 (a) (1) (ii)).

The body of each wage determination lists the classification and wage rates that have been found to be prevailing for the cited type(s) of construction in the area covered by the wage determination. The classifications are listed in alphabetical order of "identifiers" that indicate whether the particular rate is union or non-union.

Union Identifiers

An identifier enclosed in dotted lines beginning with characters other than "SU" denotes that the union classification and rate have found to be prevailing for that classification. Example: PLUM0198-005 07/01/2011. The first four letters , PLUM, indicate the international union and the four-digit number, 0198, that follows indicates the local union number or district council number where applicable , i.e., Plumbers Local 0198. The next number, 005 in the example, is an internal number used in processing the wage determination. The date, 07/01/2011, following these characters is the effective date of the most current negotiated rate/collective bargaining agreement which would be July 1, 2011 in the above example.

Union prevailing wage rates will be updated to reflect any changes in the collective bargaining agreements governing the rates.

0000/9999: weighted union wage rates will be published annually

each January.

Non-Union Identifiers

Classifications listed under an "SU" identifier were derived from survey data by computing average rates and are not union rates; however, the data used in computing these rates may include both union and non-union data. Example: SULA2004-007 5/13/2010. SU indicates the rates are not union majority rates, LA indicates the State of Louisiana; 2004 is the year of the survey; and 007 is an internal number used in producing the wage determination. A 1993 or later date, 5/13/2010, indicates the classifications and rates under that identifier were issued as a General Wage Determination on that date.

Survey wage rates will remain in effect and will not change until a new survey is conducted.

WAGE DETERMINATION APPEALS PROCESS

1.) Has there been an initial decision in the matter? This can be:

* an existing published wage determination
* a survey underlying a wage determination
* a Wage and Hour Division letter setting forth a position on a wage determination matter
* a conformance (additional classification and rate) ruling

On survey related matters, initial contact, including requests for summaries of surveys, should be with the Wage and Hour Regional Office for the area in which the survey was conducted because those Regional Offices have responsibility for the Davis-Bacon survey program. If the response from this initial contact is not satisfactory, then the process described in 2.) and 3.) should be followed.

With regard to any other matter not yet ripe for the formal process described here, initial contact should be with the Branch of Construction Wage Determinations. Write to:

Branch of Construction Wage Determinations
Wage and Hour Division
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

2.) If the answer to the question in 1.) is yes, then an interested party (those affected by the action) can request review and reconsideration from the Wage and Hour Administrator (See 29 CFR Part 1.8 and 29 CFR Part 7). Write to:

Wage and Hour Administrator
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

The request should be accompanied by a full statement of the interested party's position and by any information (wage payment data, project description, area practice material, etc.) that the requestor considers relevant to the issue.

3.) If the decision of the Administrator is not favorable, an interested party may appeal directly to the Administrative Review Board (formerly the Wage Appeals Board). Write to:

Administrative Review Board
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

4.) All decisions by the Administrative Review Board are final.

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END OF GENERAL DECISION

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

TENNESSEE DEPARTMENT OF TRANSPORTATION

2014 MINIMUM WAGE SCALES FOR STATE FUNDED CONSTRUCTION

January 1, 2014 **Tenn. DOL Decision No. T-40056**

CLASSIFICATION (ENGLISH)	CLASSIFICATION (SPANISH)	Basic Hourly Rates	Craft No.
Bricklayer	**Ladrillero**	21.99	**01**
Carpenter / Leadsperson	**Carpintero o Lider**	16.85	**02**
Class "A" Operators	**Operador Clase A**	18.62	**03**
Class "B" Operators	**Operador Clase B**	16.51	**04**
Class "C" Operators	**Operador Clase C**	17.10	**05**
Class "D" Operators	**Operador Clase D**	16.02	**06**
Concrete Finisher	**Terminador de Cemento**	15.22	**07**
Drill Operator (Caisson)	**Operador de Perfordora**	25.04	**08**
Electrician	**Electricista**	24.69	**09**
Farm Tractor Operator (Power Broom)	**Operador de Tractor de Rancho**	13.21	**10**
Ironworkers (Reinforcing)	**Herrero**	15.91	**11**
Ironworkers (Structural)	**Herrero de Estructura**	17.97	**12**
Mechanic (Class I) Heavy Duty	**Mecanico Clase 1**	20.88	**13**
Mechanic (Class II) Light Duty	**Mecanico Clase 2**	17.04	**14**
Painter / Sandblaster	**Pintor o Lajador**	26.23	**15**
Powder Person / Blaster	**Proveedor de Explosivos**	19.60	**16**
Skilled Laborer	**Obrero Diestro**	14.88	**17**
Survey Instrument Operator	**Operador de Agrimensor**	22.39	**18**
Sweeping Machine (Vacuum) Operator	**Operador de Barredora**	15.54	**19**
Truck Driver (2 axles)	**Camionero (2 ejes)**	14.17	**20**
Truck Driver (3/4 axles)	**Camionero (3 o 4 ejes)**	14.33	**21**
Truck Driver (5 or more axles)	**Camionero (5 o más ejes)**	16.93	**22**
Laborer /Unskilled , Flagger, Traffic Control, Pickup Driver	**Obrero no Diestro**	12.89	**23**
Worksite Traffic Coordinator	**Coordinar de Trafico en el Lugar de Trabajo**	19.08	**24**
Crane Operator	**Operador de la Grua**	19.02	**25**

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 (Gunite), *Pipelayer, Sign Erector

CLASS "A" OPERATORS:	**03**

Backhoe/Hydraulic Excavator (3/4 yard and over), Crane (less than 20 tons see Crane Operator below), 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

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, Striping Machine Operator, Ditch Paving Machine

CRANE OPERATOR:	**25**

Means one who operates boom-type equipment equal to or greater than 20 tons to hoist and move materials, raise and lower heavy weights and perform other related operations; may oil, grease or otherwise service and make necessary adjustments to equipment as needed; and may perform other related duties. (Note: The equipment is used for such work as pouring concrete and setting steel. This work is subject to strict inspection and must conform closely to specifications. The equipment may also be used for other miscellaneous tasks for which crane or stick-type equipment is required which may include hoist operations and pile driving operations.)

***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.

PROPOSAL

TO THE TENNESSEE DEPARTMENT OF TRANSPORTATION

NASHVILLE, 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 *Standard Specifications for Road and Bridge Construction* (March 1, 2006) 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 therefor 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 the Department 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 Standard Specifications.

By submitting this Proposal, the parties hereto, in the performance of this Contract, shall not act as employees, partners, joint ventures, or associates of one another. It is expressly acknowledged by the parties hereto that such parties are independent contracting entities and that nothing in this Contract shall be construed to create an employer/employee relationship or to allow either to exercise control or direction over the manner or method by which the other transacts its business affairs or provides its usual services. The employees or agents of one party shall not be deemed or construed to be the employees or agents of the other party for any purpose whatsoever.

By submitting this Proposal, the undersigned bidder, if awarded the conract, shall be registered with the Department of Revenue for the collection of Tennessee sales and use tax or provide confirmation from the Department of Revenue that the bidder is not required to register for the Tennessee sales and use tax. This registration requirement is a material requirement of this Contract.

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 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 per cent of the total amount of the Proposal offered and agrees and consents that the Proposal guaranty shall immediately be at the disposal of the Department, 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 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.

______________________________ Bidder (1)	Sworn to and subscribed before me
By: ___________________________	this _______ day of ________________, _____.
______________________________ Printed Name and Title	______________________________ Notary Public
	My commission expires____________________.
	(Seal)

- -

______________________________ Bidder (2)	Sworn to and subscribed before me
By: ___________________________	this _______ day of ________________, _____.
______________________________ 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.**

STATE OF TENNESSEE

DEPARTMENT OF TRANSPORTATION

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 the Department of Transportation in the full and just sum of five (5) percent 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 the Department of Transportation 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 the Department of Transportation, 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)	_______________________________ Surety (2)
By: ____________________________	By: ____________________________ General Agent or Attorney-in-Fact
_______________________________ Print Name and Title	_______________________________ Date
_______________________________ Date	(Seal)

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

STATE OF TENNESSEE

DEPARTMENT OF TRANSPORTATION

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 (5) percent of the total amount it bid for the project stated above, payable to the State of Tennessee, Department of Transportation, 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 the Department of Transportation 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 the Department of Transportation 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.**

TENNESSEE DEPARTMENT OF TRANSPORTATION

CONTRACT NO. _____

This agreement is made and executed in three (3) originals, between the State of Tennessee, Department of Transportation, hereinafter referred to as the "Department" and

_____

hereinafter referred to as the "Contractor."

WITNESSETH

The Department 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 *Tennessee Department of Transportation Standard Specifications for Road and Bridge Construction*, March 1, 2006 Edition (hereinafter referred to as the "2006 Standard Specifications")
   (f) Supplemental Specifications
   (g) Revisions and Additions
   (h) Special Provisions
   (i) Addenda
   (j) The Tennessee Department of Transportation 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 2006 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 the Department.

4. The Department 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 2006 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 the State of Tennessee 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 the State 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 the State, the Comptroller of the Treasury, 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 that $1 million dollars per occurrence and $300,000 per claimant, naming the State of Tennessee as an additional insured.

7. The Contractor shall indemnify and hold harmless the State, the Department 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, the Department may retain from the monies due to the Contractor under this Contract a sum deemed sufficient by the Department to protect the Department 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

STATE OF TENNESSEE

DEPARTMENT OF TRANSPORTATION

This Contract is accepted this _____ day of _____, _____,

and is effective on the _____ day of _____, _____.

_____
Commissioner

Approved:

_____
Department 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 the State of Tennessee, Department of Transportation, and other potential claimants, for all obligations incurred by the Principal under its contract with the State of Tennessee, Department of Transportation, 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 the Tennessee Department of Transportation 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 the Tennessee Department of Transportation 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 Department 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 Department 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 Department 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_____

By: _____
Attorney-in-Fact

_____
Printed Name

_____
Agency Name

_____
Street Address

_____
City/State/Zip

(Seal)

Surety 2_____

By: _____
Attorney-in-Fact

_____
Printed Name

_____
Agency Name

_____
Street Address

_____
City/State/Zip

(Seal)

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

For Surety 1:	**For Surety 2:**
_____	_____
Name	Name
_____	_____
Address	Address
_____	_____
City	City
_____	_____
State/Zip	State/Zip
_____	_____
Phone Number	Phone Number
_____	_____
Fax Number	Fax Number

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
CONSTRUCTION DIVISION
SUITE 700, JAMES K. POLK BUILDING
505 DEADERICK STREET
NASHVILLE, TENNESSEE 37243-1402
(615) 741-2414

JOHN C. SCHROER
COMMISSIONER

BILL HASLAM
GOVERNOR

November 25, 2014

Re: ADDENDUM #1
Contract No. CNN306
Project No. 33005-8178-44; 06001-8178-44
Hamilton and Bradley Counties
Letting Date: December 5, 2014

To Whom It May Concern:

This addendum revises the Estimated & Tabulated Quantity Sheets, Typical Section Detail sheets, and items in the bid file. It is the bidder's responsibility to notify all affected manufacturers, suppliers and subcontractors of this information.

[redacted]

[redacted]

[redacted]
Assistant Director of Construction

TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
RESURF	2015	NH-I-75-1(138)	2
		33005-8178-44	
		06001-8178-44	

REVISED 11-25-14: CHANGED QUANTITY OF ITEM NOS. 403-01, 411-03.09, 411-03.15, 411-03.16 & 415-01.02.

HAMILTON CO. ESTIMATED ROADWAY QUANTITIES

	ITEM NO.	DESCRIPTION	UNIT	QUANTITY
(1)(15)	303-01	MINERAL AGGREGATE, TYPE A BASE, GRADING D	TON	1477
	403-01	BITUMINOUS MATERIAL FOR TACK COAT (TC)	TON	100
(2)	403-05.01	BITUMINOUS MATERIAL (FOG SEAL) SHOULDER	TON	5
(3)(4)	411-03.07	ACS MIX(PG64-22) THIN LIFT CS ASPHALT	TON	1890
(3)	411-03.09	ACS MIX(PG76-22) THIN LIFT CS ASPHALT	TON	3479
(3)(5)	411-03.15	ASP CEM(PG76-22)FOR OGFC MIX	TON	364
	411-03.16	AGGREGATE FOR OGFC MIX	TON	5702
	411-12.01	SCORING SHOULDERS (CONTINUOUS) (16IN WIDTH)	L.M.	11.9
(6)	415-01.02	COLD PLANING BITUMINOUS PAVEMENT	S.Y.	141950
(16)	712-08.10	MOBILE MESSAGE SIGN UNIT W/ATTENUATOR	HOUR	1100
(7)	712-01	TRAFFIC CONTROL	LS	0.5
	712-04.01	FLEXIBLE DRUMS (CHANNELIZING)	EACH	1400
	712-05.03	WARNING LIGHTS (TYPE C)	EACH	700
(8)	712-06	SIGNS (CONSTRUCTION)	S.F.	989
(9)	712-06.16	SIGNS (CONSTRUCTION)(REDUCED SPEED WARNING)	EACH	4
	712-08.03	ARROW BOARD (TYPE C)	EACH	2
(10)	716-01.23	Snwplwble Pvmt Mrkrs (Bi-Dir)(2 Color)	EACH	600
(11)	716-02.04	PLASTIC PAVEMENT MARKING(CHANNELIZATION STRIPING)	S.Y.	95
	716-04.14	PLASTIC PAVEMENT MARKING (LANE REDUCTION ARROW)	EACH	2
(12)	716-05.20	PAINTED PAVEMENT MARKING (6" LINE)	L.M.	27.8
(13)(14)	716-12.02	ENHANCED FLATLINE THERMO PVMT MRKNG (6IN LINE)	L.M.	13.1
	716-12.05	ENHANCED FLATLINE THERMO PVMT MRKNG (6IN DOTTED LINE)	L.F.	560
	716-12.03	ENHANCED FLATLINE THERMO PVMT MRKNG (8IN BARRIER LINE)	L.F.	1210
	717-01	MOBILIZATION	LS	0.5

FOOTNOTES

(1) TO BE PLACED ON ALL SHOULDERS AFTER C-S MIX IS SPREAD AS DIRECTED BY TDOT PROJECT SUPERVISOR.
(2) TO BE USED ON THE SENIC OVERLOOK OFF SOUTHBOUND LANES AT THE HAMILTON/BRADLEY CO LINE.
(3) MATERIAL TRANSFER DEVICE (MTD) TO BE USED ON ALL MIXES. COST TO BE INCLUDED IN THE UNIT PRICE BID ON ASPHALT PAVEMENT ITEMS. SEE SPECIAL PROVISION 407G.
(4) INCLUDES 500 TON FOR SPOT LEVELING WHERE AND AS DIRECTED BY TDOT PROJECT SUPERVISOR.
(5) SEE SPECIAL PROVISION NO. 411B FOR RIDEABILITY.
(6) TO BECOME PROPERTY OF THE CONTRACTOR.
(7) INCLUDES ALL COST ASSOCIATED WITH NIGHT TIME WORK ZONE LIGHTING
(8) SEE SIGN TABULATION BLOCK THIS SHEET FOR DETAILS.
(9) ITEM TO BE USED ONLY WHEN THE CONTRACTOR ESTABLISHES A REDUCED SPEED LIMIT WITHIN THE PROJECT CONSTRUCTION WORK ZONE LIMITS. ITEM INCLUDES SIGN FACE, SUPPORTS, AND TWO TYPE "B" FLASHERS PER THE STANDARD SPECIFICATIONS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR TURNING ON THE TYPE "B" FLASHERS WHEN WORKERS ARE IN THE CONSTRUCTION WORK ZONE AND TURNING THEM OFF WHEN WORKERS ARE NO LONGER IN THE CONSTRUCTION WORK ZONE.
(10) INCLUDES ALL COST ASSOCIATED WITH REMOVAL OF EXISTING SNOW PLOWABLE MARKERS.
(11) THE CONTRACTOR MAY ELECT TO SUBSTITUTE PREFORMED PLASTIC FOR THERMOPLASTIC THE SAME UNIT PRICE SHALL BE PAID FOR PREFORMED PLASTIC.
(12) FOR PAVEMENT MARKING ON MILLED SURFACE AND INTERMEDIATE LANE MARKING AS DIRECTED BY THE TDOT PROJECT SUPERVISOR.
(13) SHALL BE APPLIED USING RIBBON METHOD AS DIRECTED BY TDOT PROJECT SUPERVISOR.
(14) FOR PERMANENT PAVEMENT MARKING.
(15) INCLUDES 572 TONS STONE TO REPAIR RUTTING OF THE EXISTING OUTSIDE NORTHBOUND SHOULDER FROM LM 15.32 TO 15.62. THE RUTTING AND GULLYS IN THE SHOULDER ARE TO BE FILLED WITH A LIFT OF STONE 12' WIDE AND 6" DEEP AND COMPACTED.
(16) SEE SPECIAL NOTE 11, SHEET 7 FOR INFORMATION.

HAMILTON CO. TABULATED SIGNS (CONST) 712-06

	QUANTITY	M.U.T.C.D. NO.	DESCRIPTION	SIZE		ITEM NO. 712-06 S.F.
				IN	X IN	
	2	G20-1	ROAD WORK NEXT 6 MILES	64	24	21
	2	G20-2	END ROAD WORK	48	24	16
(A)	2	R4-1MOD	DO NOT PASS IN RIGHT LANE	120	42	70
(B)	2	TN-55A	RECORD-A-COMMENT	96	48	64
	2	W1-4AR	SHIFT RIGHT SYMBOL	48	48	32
	2	W3-4	BE PREPARED TO STOP	48	48	32
	2	W4-2R	RIGHT LANE ENDS (SYMBOL)	48	48	32
	16	W8-11	UNEVEN LANES	48	48	256
	2	W20-1	ROAD WORK AHEAD	48	48	32
	2	W20-1	ROAD WORK 3 MILES	48	48	32
	2	W20-1	ROAD WORK 2 MILES	48	48	32
	2	W20-1	ROAD WORK 1 MILE	48	48	32
	2	W20-1	ROAD WORK 1/2 MILE	48	48	32
	2	W20-1	ROAD WORK 1500 FT	48	48	32
	2	W20-1	ROAD WORK 1000 FT	48	48	32
	2	W20-1	ROAD WORK 500 FT	48	48	32
	2	W20-5R	RIGHT LANE CLOSED 1 MILE	48	48	32
	2	W20-5R	RIGHT LANE CLOSED 1/2 MILE	48	48	32
	2	W20-5R	RIGHT LANE CLOSED 1500 FT	48	48	32
	2	W20-7a	FLAGGER	48	48	32
	2	TN-64	GROOVED PAVEMENT	48	48	32
	2	W21-2	FRESH OIL	36	36	18
	2	SPECIAL	MERGE NOW	48	48	32
			TOTAL			989

(A) BLACK LEGEND ON WHITE RETROREFLECTIVE BACKGROUND.
(B) 96"x48" (BLUE BACKGROUND WITH WHITE COPY) 0.100" SHEET ALUMINUM.

SEE FIGURE 6F-1 OF FIGURES SHOWN IN CURRENT M.U.T.C.D. THIS CONSTRUCTION SIGNING IS TO BE CONSTRUCTED AS A MINIMUM. OTHER SIGNS AS DIRECTED BY THE ENGINEER MAY BE REQUIRED DURING DIFFERENT PHASES.

SEALED BY

HAMILTON CO.

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

ESTIMATED &TABULATED QUANTITIES

TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
RESURF	2015	NH-I-75-1(138)	3
		33005-8178-44	
		06001-8178-44	

REVISED 11-25-14: CHANGED QUANTITY OF ITEM NOS. 403-01, 411-03.09, 411-03.15, 411-03.16 & 415-01.02.

BRADLEY CO. ESTIMATED ROADWAY QUANTITIES

	ITEM NO.	DESCRIPTION	UNIT	QUANTITY
(1)(2)-	303-01	MINERAL AGGREGATE, TYPE A BASE, GRADING D	TON	2476
	403-01	BITUMINOUS MATERIAL FOR TACK COAT (TC)	TON	104
(3)(4)-	411-01.10	ACS MIX(PG64-22) GRADING D	TON	120
(4)(5)-	411-03.07	ACS MIX(PG64-22) THIN LIFT CS ASPHALT	TON	2083
(4)-	411-03.09	ACS MIX(PG76-22) THIN LIFT CS ASPHALT	TON	3639
(4)(6)-	411-03.15	ASP CEM(PG76-22)FOR OGFC MIX	TON	400
	411-03.16	AGGREGATE FOR OGFC MIX	TON	6264
	411-12.01	SCORING SHOULDERS (CONTINUOUS) (16IN WIDTH)	L.M.	9
(7)(8)-	415-01.02	COLD PLANING BITUMINOUS PAVEMENT	S.Y.	150403
(9)-	712-08.10	MOBILE MESSAGE SIGN UNIT W/ATTENUATOR	HOUR	1200
(10)-	712-01	TRAFFIC CONTROL	LS	0.5
	712-04.01	FLEXIBLE DRUMS (CHANNELIZING)	EACH	900
	712-05.03	WARNING LIGHTS (TYPE C)	EACH	450
(11)-	712-06	SIGNS (CONSTRUCTION)	S.F.	989
(12)-	712-06.16	SIGNS (CONSTRUCTION)(REDUCED SPEED WARNING)	EACH	2
	712-08.03	ARROW BOARD (TYPE C)	EACH	2
	713-16.20	SIGNS (AUTHORIZED USE ONLY (TN-29)(48"x36"))	EACH	2
(13)-	716-01.23	Snwplwble Pvmt Mrkrs (Bi-Dir)(2 Color)	EACH	600
(14)-	716-02.04	PLASTIC PAVEMENT MARKING(CHANNELIZATION STRIPING)	S.Y.	35
	716-04.14	PLASTIC PAVEMENT MARKING (LANE REDUCTION ARROW)	EACH	2
(15)-	716-05.20	PAINTED PAVEMENT MARKING (6" LINE)	L.M.	20
(16)(17)-	716-12.03	ENHANCED FLATLINE THERMO PVMT MRKNG (8IN BARRIER LINE)	L.F.	360
	716-12.02	ENHANCED FLATLINE THERMO PVMT MRKNG (6IN LINE)	L.M.	20
	716-12.05	ENHANCED FLATLINE THERMO PVMT MRKNG (6IN DOTTED LINE)	L.F.	125
	717-01	MOBILIZATION	LS	0.5

FOOTNOTES

(1) TO BE PLACED ON ALL SHOULDERS AFTER C-S MIX IS SPREAD AS DIRECTED BY TDOT PROJECT SUPERVISOR.
(2) INCLUDES 1500 TONS FOR SHOULDER WORK ON THE OUTSIDE NORTH BOUND SHOULDER @ LM 0.00 - LM 0.64 AND 120 TONS FOR FOR CROSS-OVER REPAIR @ LM 2.031 - 2.103.
(3) TO BE USED FOR CROSS-OVER REPAIR LM 2.031 - 2.103. SEE SPECIAL NOTE 36, SHEET 7 FOR ADDITIONAL INFORMATION.
(4) MATERIAL TRANSFER DEVICE (MTD) TO BE USED ON ALL MIXES. COST TO BE INCLUDED IN THE UNIT PRICE BID ON ASPHALT PAVEMENT ITEMS. SEE SPECIAL PROVISION 407G.
(5) INCLUDES 500 TON FOR SPOT LEVELING WHERE AND AS DIRECTED BY TDOT PROJECT SUPERVISOR
(6) SEE SPECIAL PROVISION NO. 411B FOR RIDEABILITY.
(7) TO BECOME PROPERTY OF CONTRACTOR.
(8) INCLUDES 1800 SY OF MILLED MATERIAL FROM CROSS-OVER.
(9) SEE SPECIAL NOTE 11, SHEET 7.
(10) INCLUDES ALL COST ASSOCIATED WITH NIGHT TIME WORK ZONE LIGHTING
(11) SEE SIGN TABULATION BLOCK THIS SHEET FOR DETAILS.
(12) ITEM TO BE USED ONLY WHEN THE CONTRACTOR ESTABLISHES A REDUCED SPEED LIMIT WITHIN THE PROJECT CONSTRUCTION WORK ZONE LIMITS. ITEM INCLUDES SIGN FACE, SUPPORTS, AND TWO TYPE "B" FLASHERS PER THE STANDARD SPECIFICATIONS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR TURNING ON THE TYPE "B" FLASHERS WHEN WORKERS ARE IN THE CONSTRUCTION WORK ZONE AND TURNING THEM OFF WHEN WORKERS ARE NO LONGER IN THE CONSTRUCTION WORK ZONE.
(13) INCLUDES ALL COSTS ASSOCIATED WITH REMOVAL OF EXISTING SNOWPLOWABLE MARKERS.
(14) THE CONTRACTOR MAY ELECT TO SUBSTITUTE PREFORMED PLASTIC FOR THERMOPLASTIC THE SAME UNIT PRICE SHALL BE PAID FOR PREFORMED PLASTIC.
(15) FOR PAVEMENT MARKING ON MILLED SURFACE AND INTERMEDIATE LANE MARKING AS DIRECTED BY THE TDOT PROJECT SUPERVISOR.
(16) SHALL BE APPLIED USING RIBBON METHOD AS DIRECTED BY TDOT PROJECT SUPERVISOR.
(17) FOR PERMANENT PAVEMENT MARKING.

BRADLEY CO. TABULATED SIGNS (CONST) 712-06

	QUANTITY	M.U.T.C.D. NO.	DESCRIPTION	SIZE IN X IN		ITEM NO. 712-06 S.F.
	2	G20-1	ROAD WORK NEXT 6 MILES	64	24	21
	2	G20-2	END ROAD WORK	48	24	16
(A)	2	R4-1MOD	DO NOT PASS IN RIGHT LANE	120	42	70
(B)	2	TN-55A	RECORD-A-COMMENT	96	48	64
	2	W1-4AR	SHIFT RIGHT SYMBOL	48	48	32
	2	W3-4	BE PREPARED TO STOP	48	48	32
	2	W4-2R	RIGHT LANE ENDS (SYMBOL)	48	48	32
	16	W8-11	UNEVEN LANES	48	48	256
	2	W20-1	ROAD WORK AHEAD	48	48	32
	2	W20-1	ROAD WORK 3 MILES	48	48	32
	2	W20-1	ROAD WORK 2 MILES	48	48	32
	2	W20-1	ROAD WORK 1 MILE	48	48	32
	2	W20-1	ROAD WORK 1/2 MILE	48	48	32
	2	W20-1	ROAD WORK 1500 FT	48	48	32
	2	W20-1	ROAD WORK 1000 FT	48	48	32
	2	W20-1	ROAD WORK 500 FT	48	48	32
	2	W20-5R	RIGHT LANE CLOSED 1 MILE	48	48	32
	2	W20-5R	RIGHT LANE CLOSED 1/2 MILE	48	48	32
	2	W20-5R	RIGHT LANE CLOSED 1500 FT	48	48	32
	2	W20-7a	FLAGGER	48	48	32
	2	TN-64	GROOVED PAVEMENT	48	48	32
	2	W21-2	FRESH OIL	36	36	18
	2	SPECIAL	MERGE NOW	48	48	32
			TOTAL			989

(A) BLACK LEGEND ON WHITE RETROREFLECTIVE BACKGROUND.
(B) 96"x48" (BLUE BACKGROUND WITH WHITE COPY) 0.100" SHEET ALUMINUM.

SEE FIGURE 6F-1 OF FIGURES SHOWN IN CURRENT M.U.T.C.D. THIS CONSTRUCTION SIGNING IS TO BE CONSTRUCTED AS A MINIMUM. OTHER SIGNS AS DIRECTED BY THE ENGINEER MAY BE REQUIRED DURING DIFFERENT PHASES.

SEALED BY

ROBERT W. RODGERS
REGISTERED ENGINEER
AGRICULTURE
COMMERCE
NO. 0002299
STATE OF TENNESSEE

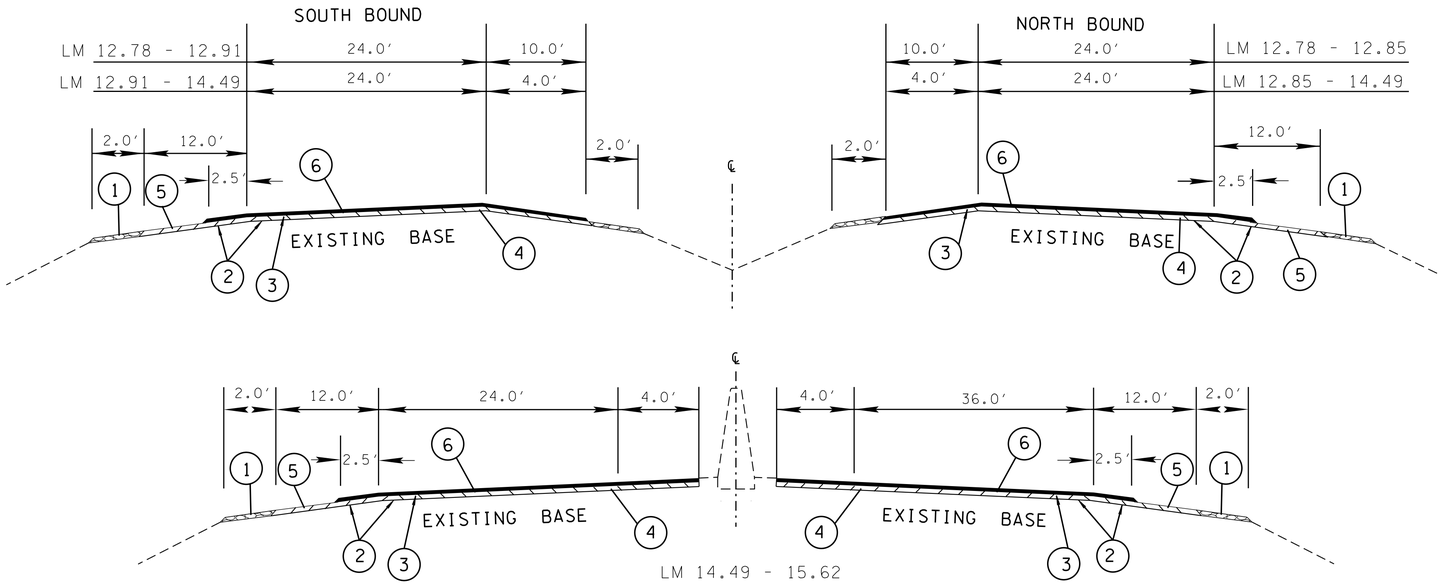
BRADLEY CO.

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

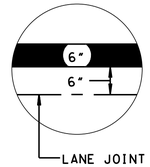
ESTIMATED &TABULATED QUANTITIES

TYPE	YEAR	PROJECT NO.	SHEET NO.
RESURF	2015	NH-I-75-1(138)	4
		33005-8178-44	
		06001-8178-44	

REVISED 11-25-14 CHANGED INSIDE 5' SHOULDERS TO 4' ON TYPICALS



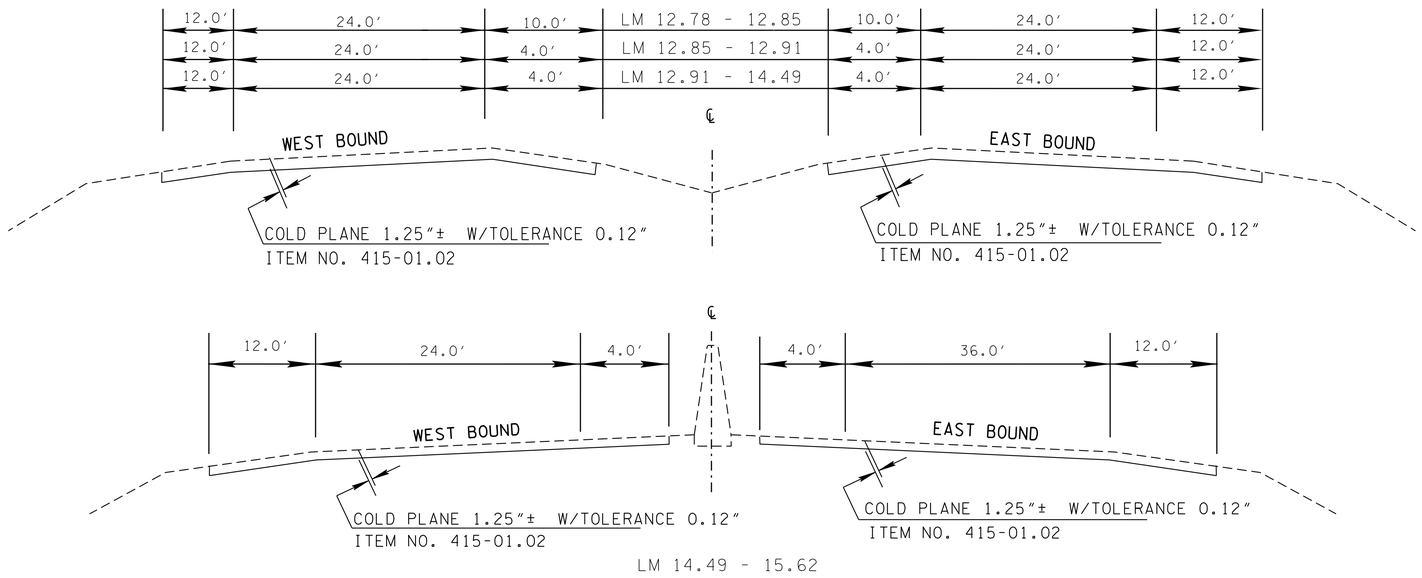
TYPICAL SECTIONS



LANE JOINT IS TO BE OFF SET 6" FROM CENTER OF ROADWAY.

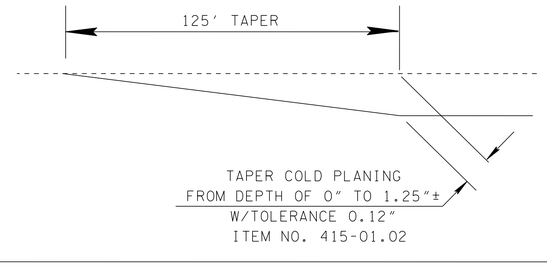
TYPICAL SECTION

PROPOSED PAVEMENT SCHEDULE	
1	TO BE PLACED ON ALL SHOULDERS AFTER CS MIX IS SPREAD AS DIRECTED BY TDOT PROJECT SUPERVISOR @ 1.5" DEPTH. ITEM 303-01 MINERAL AGGREGATE, TYPE A BASE, GRADING D
2	TACK COAT (TC) @ (0.10 GAL./S.Y.) ITEM 403-01 BITUMINOUS MATERIAL FOR TACK COAT (TC)
3	TACK COAT (TC) @ (0.07 GAL./S.Y.) ITEM 403-01 BITUMINOUS MATERIAL FOR TACK COAT (TC)
4	THIN LIFT "CS" MIX @ APPROX. ⅝" THICK (APPROX 65 LBS./S.Y.) (* WITHOUT SILICEOUS AGGREGATE) ITEM 411-03.09 ACS MIX(PG76-22) THIN LIFT CS MIX
5	THIN LIFT "CS" MIX @ APPROX. ⅝" THICK (APPROX 65 LBS./S.Y.) (* WITHOUT SILICEOUS AGGREGATE) ITEM 411-03.07 ACS MIX(PG64-22) THIN LIFT CS MIX
6	BITUMINOUS SURFACE @ 1.25"± THICK (APPROX. 110 LBS./S.Y.) ITEM 411-03.15 ASPHALT CEMENT (PG76-22) FOR OGFC MIX ITEM 411-03.16 AGGREGATE FOR OGFC MIX



COLD PLANING DETAIL

COLD PLANING TAPER DETAIL



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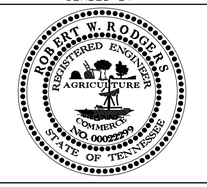


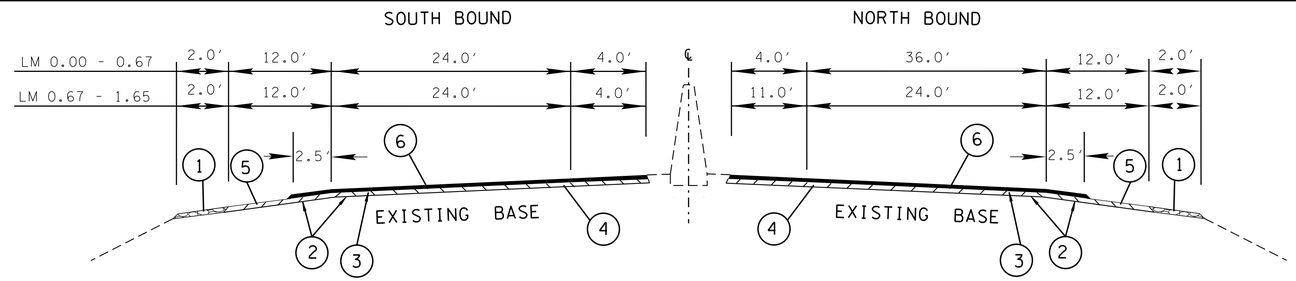
HAMILTON CO.

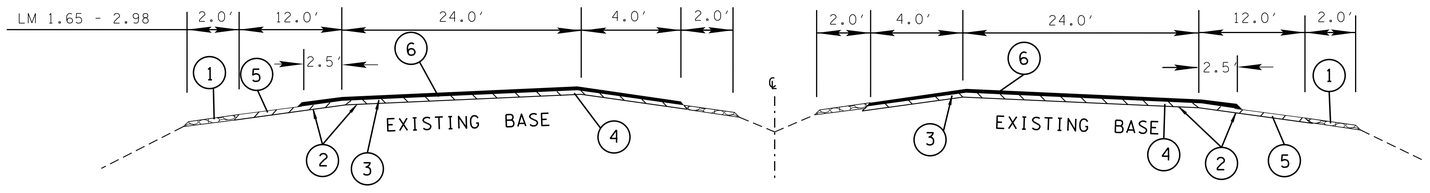
STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

TYPICAL SECTIONS & DETAILS

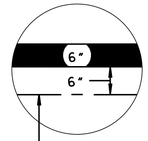
TYPE	YEAR	PROJECT NO.	SHEET NO.
RESURF	2015	NH-I-75-1(138)	5
		33005-8178-44	
		06004-8178-44	

REVISED 11-25-14 CHANGED INSIDE 5' SHOULDERS TO 4' ON TYPICALS





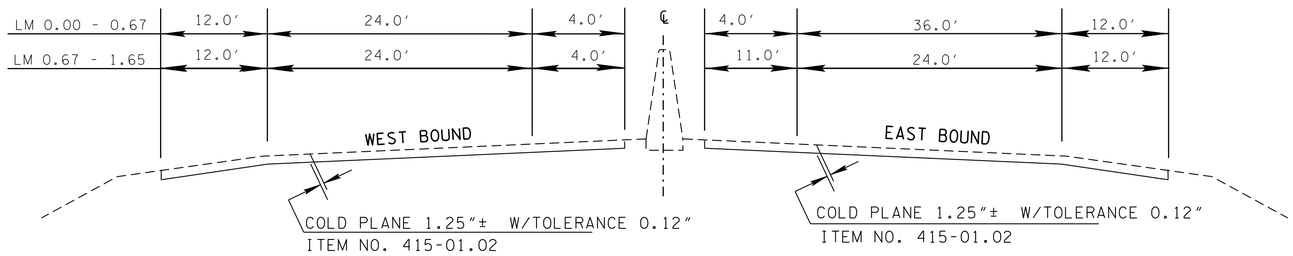
TYPICAL SECTIONS

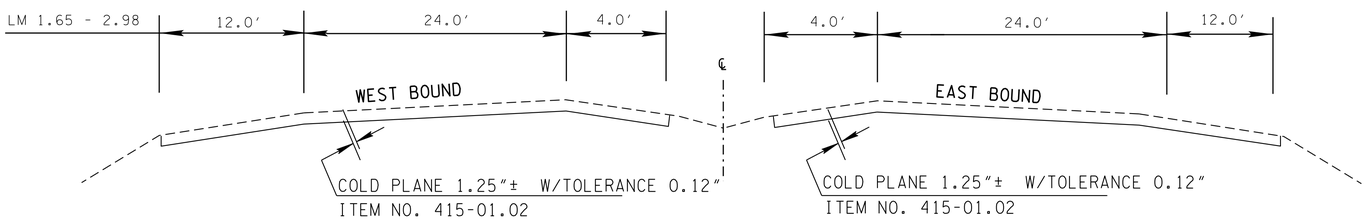


LANE JOINT IS TO BE OFF SET 6" FROM CENTER OF ROADWAY.

TYPICAL SECTION

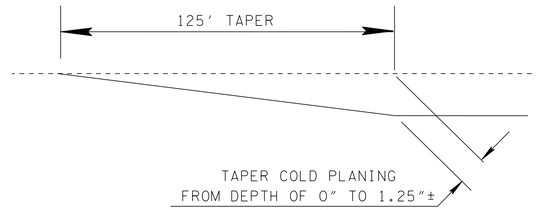
PROPOSED PAVEMENT SCHEDULE	
1	TO BE PLACED ON ALL SHOULDERS AFTER CS MIX IS SPREAD AS DIRECTED BY TDOT PROJECT SUPERVISOR @ 1.5" DEPTH. ITEM 303-01 MINERAL AGGREGATE, TYPE A BASE, GRADING D
2	TACK COAT (TC) @ (0.10 GAL./S.Y.) ITEM 403-01 BITUMINOUS MATERIAL FOR TACK COAT (TC)
3	TACK COAT (TC) @ (0.07 GAL./S.Y.) ITEM 403-01 BITUMINOUS MATERIAL FOR TACK COAT (TC)
4	THIN LIFT "CS" MIX @ APPROX. ⅝" THICK (APPROX 65 LBS./S.Y.) (* WITHOUT SILICEOUS AGGREGATE) ITEM 411-03.09 ACS MIX(PG76-22) THIN LIFT CS MIX
5	THIN LIFT "CS" MIX @ APPROX. ⅝" THICK (APPROX 65 LBS./S.Y.) (* WITHOUT SILICEOUS AGGREGATE) ITEM 411-03.07 ACS MIX(PG64-22) THIN LIFT CS MIX
6	BITUMINOUS SURFACE @ 1.25"± THICK (APPROX. 110 LBS./S.Y.) ITEM 411-03.15 ASPHALT CEMENT (PG76-22) FOR OGFC MIX ITEM 411-03.16 AGGREGATE FOR OGFC MIX





COLD PLANING DETAIL

COLD PLANING TAPER DETAIL



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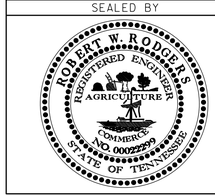

BRADLEY CO.

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

TYPICAL SECTIONS & DETAILS

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
CONSTRUCTION DIVISION
SUITE 700, JAMES K. POLK BUILDING
505 DEADERICK STREET
NASHVILLE, TENNESSEE 37243-1402
(615) 741-2414

JOHN C. SCHROER
COMMISSIONER

BILL HASLAM
GOVERNOR

December 4, 2014

Re: ADDENDUM #2
Contract No. CNN306
Project No. 33005-8178-44; 06001-8178-44
Hamilton and Bradley Counties
Letting Date: December 5, 2014

To Whom It May Concern:

This addendum revises Table of Contents, and Special Provision 411OGFC in the contract. The coarse aggregate shall have a LA Abrasion value less than 38%. It is the bidder's responsibility to notify all affected manufacturers, suppliers and subcontractors of this information.

[redacted]

[redacted]

[redacted]
Assistant Director of Construction

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

SHEET 1 of 2
PROJECT NO. 06001-8178-44,33005-8178-44
(REV. 12/04/14)
COUNTIES BRADLEY,& HAMILTON

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

Contract Payment and Performance Bond

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 Construction Division, upon request.

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

Rev. 04-08-2010 MW
Rev. 12-04-2014 JF

March 1, 2006

SPECIAL PROVISION

REGARDING

BITUMINOUS PLANT MIX (HOT MIX) OPEN-GRADED FRICTION COURSE

Description: This specification covers the requirements for the placement of an Open Graded Friction Course (OGFC). The work shall consist of the design and construction of an Asphalt Concrete surface in accordance with Sections 407, 411, and 903 of the Specifications. All requirements for the Asphalt Concrete surface (Hot-mix) Grading D in Sections 407, 411, and 903 shall apply to this item except as revised herein.

Material: All OGFC designs shall follow NAPA Publication, "*Design, Construction and Maintenance of Open-Graded Friction Courses*" published in 2002 except where modified here in. The OGFC shall be designed utilizing a Marshall compaction hammer at 50 blows. The contractor shall formulate and submit a job mix formula that satisfies the general design limits in Table-1 Mixture Requirements.

Coarse Aggregate: Coarse aggregates, materials retained above the #4 sieve, shall be virgin and from approved sources and shall meet all the requirements of **Subsection 903.11(a)**. A minimum of 75% of coarse aggregates shall meet the requirements of **Subsection 903.11(c)**. The coarse aggregate shall have at least 90% crushed aggregate with 2 fractured faces and 100% with one fractured face as determined by ASTM D 5821. The coarse aggregate shall have a LA Abrasion value less than 38% and a maximum absorption of 3.0%.

Stabilizing Additive Material: The stabilizing additive shall conform to AASHTO M 325, Section 8. Fiber pellets shall not be used. Slag Wool Fiber or Cellulose Fiber shall be blown into the asphalt plant measured by a flow meter or sensing device that is accurate to within ±10% of the amount required. For Batch Plants, fibers shall be added in to pugmill or weigh hopper. For drum plants, the fiber line shall be placed one foot upstream of the asphalt binder line so that the fibers are captured by the asphalt binder before being exposed to high-velocity gases in the drum. The minimum additive for a slag wool fiber shall be 0.4% and the minimum for a cellulose fiber shall be 0.3%. .

Performance Graded Asphalt Cement: The Performance Graded Asphalt Cement shall be of the type specified and shall meet TDOT specification **Subsection 904.01**.

Production: The temperature of the OGFC mix shall not exceed 350º F at any time during production.

Placement: A Material Transfer Device (MTD) capable of unloading a truck or trailer load of hot mix asphalt without moving the truck shall be utilized when placing OGFC. Haul trucks shall be thoroughly coated with a TDOT Qualified Product List(QPL) approved release agent, such that there are no puddles in the truck bed.

Revise Subsection 407.09-Weather Limitations to read as follows:

The OGFC shall be placed only when the pavement surface temperature and the ambient air temperature are a minimum 55° F and rising. OGFC will not be placed during foggy or rainy conditions. The placement of OGFC shall be limited to the period from April 1 to November 1.

Compaction: Compaction of the wearing course shall consist of a minimum of two passes with a steel double drum asphalt roller with minimum weight of 10 tons, before the material temperature has fallen below 185º F. At no time shall the rollers be allowed to remain stationary on the freshly placed asphalt concrete. Rollers shall be equipped with functioning water system and scrapers to prevent adhesion of the fresh mix onto the roller drums. A minimum of two roller units shall be supplied so the compaction will be accomplished promptly following the placement of the material. The breakdown roller should be within 50 feet of the paver. A release agent (added to the water system) may be required to prevent adhesion of the fresh mix to the roller drum and wheels. At no time shall a pneumatic tire roller be used or a steel wheel roller be used in vibratory mode. If the roller begins to break the aggregate, the contractor shall stop rolling immediately. No in place density readings will be required for acceptance.

Method of Measurement: As per **Subsection 411.09**, the accepted quantities of Open Graded Friction Course shall be paid for at the respective contract unit price per ton for Mineral Aggregate and Asphalt Cement. The addition of a stabilizing additive material (fiber) shall be included in the cost of the Asphalt Cement.

Basis of Payment: As per **Subsection 411.10**, the unit price per ton shall include all labor, materials and equipment necessary to complete the work. For bidding purposes, the target binder content of the OGFC shall be 6.0%

Table 1 – Mixture Requirements
Composition by percent weight

Sieve Size	Percent Passing	Production Tolerances
¾ in.	100	-
½ in.	85 – 100	±4.0%
3/8 in.	55 – 75	±4.0%
#4	10 – 25	±4.0%
#8	5 – 10	±3.0%
#30	-	-
#50	-	-
#100	-	-
#200	2 - 4	±2.0%
Asphalt Cement	6.0% Minimum	±0.25%
Air Voids	20% Minimum	
Stabilizing Additive	0.30% or .040%	
$VCA_{DRC} > VCA_{MIX}$		
Moisture Susceptibility	80% Minimum	
Cantabro Test	Unaged 20% Maximum	
Draindown	<0.3%	

If during production, the OGFC gradation or asphalt content fall outside of the tolerances that are listed in the table, the contractor shall stop production and correct the problem. Then the contractor shall be limited to 100 tons production until gradation and asphalt content are inside the production tolerances listed above. Mixture placed that is out of tolerance, may be required to be removed and replaced at the Contractors expense.

Revise Subsection 407.03-Composition of Mixtures. Section (C) to read as follows:

(C) Job Mix Formula:

1. General:

   At least 21 working days prior to the scheduled start of production of any asphalt paving mixture, the Contractor shall submit in writing in duplicate a proposed Job Mix Formula and Laboratory Design. The mix shall be designed according to NAPA Publication, "*Design, Construction and Maintenance of Open-Graded Friction Courses*" published in **2002.** Design specimens shall be compacted with 50 blows of a Marshall compaction hammer and the optimum asphalt content and mixture volumetrics shall be determined at that compaction level. If the specification requirements are not met, it will be necessary to make adjustments to the aggregate types and proportions. If requested, the Department will assist the contractor with the design process. In addition the Contractor shall submit to the Engineer for approval an asphalt barge certification with temperature-viscosity curve for each mixture. A sample of each material to be used in the mix shall be delivered to the location designated by the Engineer.

   The following information shall be furnished:

   a. The specific project on which the mixture will be used.
   b. The source and description of all materials to be used in the mix.
   c. The gradations and approximate proportions of the raw materials as intended to be combined in the paving mixture.
   d. A single percentage of the combined mineral aggregate passing each specified sieve. The combined aggregate gradation shall be plotted on a gradation chart with sieve sizes raised to the 0.45 power to assure a well graded mix.
   e. The Loss on Ignition (L.O.I.) results on the combined aggregate.
   f. The Bulk Specific Gravity, Apparent Specific Gravity and absorption on the combined mineral aggregate in the paving mixture (AASHTO T 84 and T 85)
   g. The fractured face count (ASTM D 5821) and glassy particle count of the plus No. 4 material, if applicable.
   h. A single percentage of asphalt by weight of total mix intended to be incorporated in the completed mixture.
   i. The dosage rate and source of anti-stripping additive, if required, meeting the requirements of Section 918.09 (B), to be added to the asphalt.
   j. The maximum specific gravity of the asphalt mixture (AASHTO T 209).
   k. A single temperature at which the mixture is intended to be discharged from the plant.
   l. Evidence that the completed mixture will conform to all specified physical requirements established herein.
   m. The tensile strength ratio (TSR) indicating the stripping and moisture susceptibility characteristics of the mix.

n. In order to identify critical mixes and make appropriate adjustments, the mix design should have the required design properties for the bitumen content range of Optimum Asphalt Cement ± 0.25%.
o. The dosage rate and source of stabilizing additive, meeting the requirements of AASHTO M 325, that is sufficient to prevent draindown at plant production temperatures.
p. Draindown sensitivity results, in accordance with AASHTO T 305 at the anticipated plant production temperature and shall not exceed 0.30%.

The temperature shown on the Job Mix Formula shall be the optimum mixing temperature as shown on the temperature-viscosity curve. The mixing temperature of Polymer or Latex Modified Asphalt mixes shall not exceed 350 degrees F.
The Laboratory Design must be prepared and signed by a Certified Laboratory Technician. To be certified, the technician must have completed the TDOT Mix Design Workshop School conducted by the Department, including the written and lab performance testing.

2. Revision of Job Mix Formula:

The approved job mix formula shall remain in effect until a change is authorized in writing by the Engineer. The Contractor, at any time after construction has started, may request that the job mix formula be revised, providing evidence is shown that the revision is necessary and the revised aggregate gradation will meet all applicable gradation requirements.

A new design will be required for any change in source of materials. All requests for design mix adjustments, redesigns and new design mixes will be submitted in writing to the Engineer for approval.