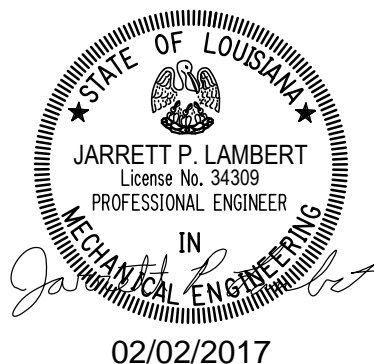


**STATE OF LOUISIANA
DEPARTMENT OF TRANSPORTATION AND
DEVELOPMENT**

CONSTRUCTION PROPOSAL



**STATE PROJECT NO. H.011425
CONTROL SECTION 382-04
BLACK BAYOU PONTOON BR
COLLISION REPAIRS
ROUTE LA 384
CALCASIEU PARISH**



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NOTICE TO CONTRACTORS (01/16)

Electronic bids and electronic bid bonds for the following project will be downloaded by the Louisiana Department of Transportation and Development (LA DOTD) on **Wednesday, March 8, 2017. Paper bids and paper bid bonds will not be accepted.** Electronic bids and electronic bid bonds must be submitted through www.bidx.com prior to the electronic bidding deadline. Beginning at 10:00 a.m., all bids will be downloaded and posted online at <http://www.wapps.dotd.la.gov/engineering/lettings/>. No bids are accepted after 10:00 a.m.

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CONTROL SECTION NO. 382-04

DESCRIPTION: BLACK BAYOU PONTOON BR COLLISION REPAIRS

ROUTE: LA 384

PARISH: CALCASIEU

TYPE: FENDER SYSTEM REPAIR, MOVABLE BRIDGE MACHINERY REPAIR, STRUCTURAL METALWORK, TREATED TIMBER PILES (COASTAL), STEEL PILES, AND RELATED WORK

LIMITS: State Project No. H.011425: LOCATED ON THE ROUTE LA 384 PONTOON BRIDGE (BLACK BAYOU) AT THE INTRACOSTAL WATERWAY

ESTIMATED COST RANGE: \$500,000 to \$1,000,000

The estimated cost range is for informational purposes only and may be subject to change. The bid prices received from bidders will be evaluated based on the actual estimate value, which will be published at bid opening, for award determination.

PROJECT ENGINEER: TYSON THEVIS, P.E.; 5827 US 90 EAST, LAKE CHARLES, LA 70615; 337-437-9200

PROJECT MANAGER: JARRETT LAMBERT, P.E.

Bids must be prepared and submitted in accordance with Section 102 of the *2006 Louisiana Standard Specifications for Roads and Bridges* as amended by the project specifications, and must include all information required by the proposal.

Prior to the electronic bid submission deadline, ONLINE BIDDER REGISTRATION for each project bid is REQUIRED. Online Bidder Registration may be accessed via the Internet at www.sp.dotd.la.gov. Select the following options: **BUSINESS Working With DOTD**, then **Project Letting Info**, then **Online Bidder Registration**.

NOTICE TO CONTRACTORS (01/16)

When completed, a registration confirmation notice will be displayed and may be printed by the bidder. When approved for bidding, the bidder's name will be placed on the "List of Prospective Bidders" located on the LA DOTD Internet website. **It is the bidder's responsibility to review the "List of Prospective Bidders" to ensure approval to bid.** If a bidder does not register for a project, the bid will not be accepted by LA DOTD. As per Subsection 102.04(e) of the 2006 edition of the *Louisiana Standard Specifications for Roads and Bridges*, no bidders will be approved for bid registration within 24 hours before the bid opening. All bidders must register to bid before that deadline. If further information is required, please contact Mr. Alfonzo Simon, email: Alfonzo.Simon@la.gov, (225) 379-1111, fax : (225) 379-1857.

Plans and proposals are available in electronic format ONLY. All Plans, Proposals, Addenda, Amendments, Letters of Clarification, and Withdrawal Notices will be posted online. **Paper notices will not be distributed.**

Construction proposal information may be accessed via the Internet at wwwsp.dotd.la.gov. From the LA DOTD home page, select the following options: **BUSINESS Working With DOTD**, then **Project Letting Info**. Once the **Construction Letting Information** page appears, find the **Notice to Contractors** box. From the drop down menu, select the appropriate letting date and press the "Go To" button to open the page, which provides a listing of all projects to be let and a **Construction Proposal Documents** link for each project. All project specific notices are found here. **It will be the responsibility of the bidder to check for updates.** Additionally, plans and specifications may be seen in Room 100-A of the LA DOTD Headquarters Building, 1201 Capitol Access Road in Baton Rouge, LA or at the Project Engineer's office. Upon request, the Project Engineer will show the project site.

All questions concerning the plans shall be submitted via the Electronic Plans Distribution Center known as **Falcon**. All submitted questions will be forwarded by email to the Project Manager and the Project Engineer. Questions submitted within a period of 96 hours prior to the advertised time for the opening of bids, excluding Saturdays, Sundays, and any other legal holidays, may not be answered prior to bidding. Falcon may be accessed via the Internet at wwwsp.dotd.la.gov. From the home page, select **BUSINESS Working With DOTD**, then select **Project Letting Info**. On the Construction Letting Information page, select the link, **DOTD Plans Room (Falcon)**; Login to Falcon (or request an ID if a first-time user). Once logged in, you will have access to view Project Information, submit a question concerning the project, and view the plans. To avoid any suggestion that a potential bidder is using the Falcon system to communicate with other potential bidders, DOTD will not post any question or any statement of fact or opinion not made for the purpose of seeking clarification of plans and/or specifications. Any non-questions posted on falcon will be limited to the statement of an issue considered unresolved by a previous DOTD response.

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Bidders assume the responsibility for accessing the Apparent Bid Results and final Bid Results on the Construction Letting Information web page located at wwwapps.dotd.la.gov/engineering/lettings/ to confirm whether they are the apparent low bidder for any given project and the specific due date of Form CS-6AAA. **Apparent Low Bidders on Disadvantaged Business Enterprises (DBE)/Small Business Element (SBE) Goal Projects shall comply fully with the “Required Contract Provisions for DBE/SBE Participation in Federal Aid Construction Contracts (DBE/SBE Goal Project)” contained in Section “G” of the Proposal; and, in accordance therewith, Apparent Low Bidders shall submit the completed Form CS-6AAA and Attachments to the LA DOTD Compliance Programs Office.** The award of the contract will be electronically submitted to the successful low bidder on each project.

The U. S. Department of Transportation (DOT) operates a 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 call 1-800-424-9071. All information will be treated confidentially and caller anonymity will be respected.

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GENERAL BIDDING REQUIREMENTS (08/06): The specifications, contract and bonds governing the construction of the work are the 2006 Edition of the Louisiana Standard Specifications for Roads and Bridges, together with any supplementary specifications and special provisions attached to this proposal.

Bids shall be prepared and submitted in accordance with Section 102 of the Standard Specifications.

The plans herein referred to are the plans approved and marked with the project number, route and Parish, together with all standard or special designs that may be included in such plans.

The bidder declares that the only parties interested in this proposal as principals are those named herein; that this proposal is made without collusion or combination of any kind with any other person, firm, association, or corporation, or any member or officer thereof; that careful examination has been made of the site of the proposed work, the plans, Standard Specifications, supplementary specifications and special provisions above mentioned, and the form of contract and payment, performance, and retainage bond; that the bidder agrees, if this proposal is accepted, to provide all necessary machinery, tools, apparatus and other means of construction and will do all work and furnish all material specified in the contract, in the manner and time therein prescribed and in accordance with the requirements therein set forth; and agrees to accept as full compensation therefore, the amount of the summation of the products of the quantities of work and material incorporated in the completed project, as determined by the engineer, multiplied by the respective unit prices herein bid.

It is understood by the bidder that the quantities given in this proposal are a fair approximation of the amount of work to be done and that the sum of the products of the approximate quantities multiplied by the respective unit prices bid shall constitute gross sum bid, which sum shall be used in comparison of bids and awarding of the contract.

The bidder further agrees to perform all extra and force account work that may be required on the basis provided in the specifications.

The bidder further agrees that within 15 calendar days after the contract has been transmitted to him, he will execute the contract and furnish the Department satisfactory surety bonds.

If this proposal is accepted and the bidder fails to execute the contract and furnish bonds as above provided, the proposal guaranty shall become the property of the Department; otherwise, said proposal guaranty will be returned to the bidder; all in accordance with Subsection 103.04.

MANDATORY ELECTRONIC BIDS AND ELECTRONIC BID BONDS SUBMISSION (03/14): This project requires mandatory electronic bidding. All Specifications, whether Standard, Supplemental or Special Provisions, are hereby amended to delete any references regarding paper bids and the ability to submit paper bid forms.

The contractor shall register online to be placed on the Louisiana Department of Transportation and Development (LA DOTD) prospective bidders list or for information only list.

Modifications to proposal documents will be posted on the Department's website at the following URL address: <http://wwwapps.dotd.la.gov/engineering/lettings/>.

LA DOTD shall not be responsible if the bidder cannot complete and submit a bid due to failure or incomplete delivery of the files submitted via the internet.

BUY AMERICA PROVISIONS (05/15): Pursuant to the "Buy America Provisions" of the Surface Transportation Assistance Act (STAA) of 1982 as promulgated by current FHWA regulation 23 CFR 635.410 and the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA) amendment to (STAA), all steel and iron materials permanently installed on this project

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shall be manufactured, including application of a coating, in the United States, unless a waiver of these provisions is granted. Coating includes all processes which protect or enhance the value of the material to which the coating is applied. The request for waiver must be presented in writing to the Department by the contractor. Such waiver may be granted if it is determined that:

(1) The application of Buy America Provisions would be inconsistent with the public interest or;

(2) Such materials are not produced in the United States in sufficient and reasonably available quantities and of a satisfactory quality.

Minimal use of foreign steel and iron materials will be allowed without waiver provided the cost of these materials does not exceed 0.1 percent of the total contract cost or \$2,500, whichever is greater; however, the contractor shall make written request to the Chief Construction Division Engineer for permission to use such foreign materials and shall furnish a listing of the materials, their monetary value, and their origin and place of production.

The burden of proof for the origin and place of production and any request for waiver is the responsibility of the contractor.

Prior to the use of steel and iron materials in the project, the contractor shall furnish Mill Test Reports to the engineer for such steel and iron materials, accompanied by a certification stating that the Mill Test Reports represent the steel and iron materials to be furnished and that such materials were produced and fabricated in the United States.

Pig iron and processed, pelletized, and reduced iron ore are exempt from the Buy America Provisions.

CARGO PREFERENCE ACT OF 1954 (CPA) (01/16): Where applicable, the contractor must comply with all requirements of the Cargo Preference Act of 1954, as amended, and with its implementing regulations in 46 CFR 381. The provisions of 46 CFR 381.7(a)-(b) are hereby incorporated by reference into this contract.

IRREGULAR BIDS (08/14): Subsection 102.08 is hereby amended to include the following revision to section (g), and the addition of section (p):

g) If an owner (part or as a whole), registered agent, license holder, manager, organizer, or a principal officer(s) of the bidding entity is an owner (part or as a whole), registered agent, license holder, manager, organizer, or a principal officer(s) of another or the same bidding entity of a contracting entity which has been declared by the Department to be ineligible to bid for any reason.

p) If the apparent low bidder fails, neglects, or refuses to properly and timely submit if required, the Form CS-6AAA and attachments committing to meet or exceed the DBE goal and/or acceptable documentation of the bidder's good faith efforts to meet the goal. Upon any such failure, the original apparent low bidder will be declared irregular and will not be allowed to bid on the project should re-advertisement occur.

MAINTENANCE OF TRAFFIC: Subsection 104.03 of the 2006 Standard Specifications is amended to include the following requirements.

Except during work on the apron tower & platform, the contractor shall provide for and maintain through and local traffic at all times and shall conduct his operations in such manner as to cause the least possible interference with traffic at junctions with roads, streets and driveways.

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No work shall be allowed, all lanes shall be open, and all time charges shall stop during New Year's, Mardi Gras, Easter, Memorial Day, Independence Day, Labor Day, Thanksgiving, Christmas holiday periods, and other events as directed by the project engineer. No work shall be allowed, all lanes shall be open, and all time charges shall stop in preparation for or during hurricane contra flow operations.

SANITARY, HEALTH AND SAFETY PROVISIONS (08/16): Section 107.06 of the 2006 Standard Specifications is amended to include the following requirements.

If the contractor provides an Emergency, Health and Safety (EHS) plan during the preconstruction conference, all Department employees assigned to the project shall comply with the plan while on or adjacent to the job site. The contractor shall not be liable under 107.17 for bodily injuries, death, or damages sustained by the Department, or by any Department employee, due directly to the Department employee's failure to abide by the EHS plan provided by the contractor.

NAVIGABLE WATERS AND WETLANDS (10/12): Subsection 107.09 of the Standard Specifications is amended to include the following.

In accordance with the provisions of this Subsection, the Department has obtained the required U.S. Army Corps of Engineers permit.

The Department has obtained a Coastal Use Permit or other approval from the Louisiana Department of Natural Resources, Coastal Management Division, for all work within the Louisiana Coastal Zone.

Bidders shall comply with the permit requirements. Bidders may view permit(s) online via the Department's FALCON system, or obtain a copy by contacting the Department's Environmental Section at (225) 379-1317.

CONTRACTOR'S RESPONSIBILITY FOR WORK (07/09): Section 107 Legal Relations and Responsibility to Public of the 2006 Standard Specifications is amended as follows:

Subsection 107.19, Contractor's Responsibility for Work is amended to delete the first paragraph of Subpart (b) and substitute the following:

Unavoidable damage due to Acts of God such as earthquake, tidal wave, tornado, hurricane, or other cataclysmic phenomenon of nature or acts of governmental authorities, except for materials and equipment that are not incorporated in the work.

SUBLETTING OF CONTRACT (01/83): In accordance with Subsection 108.01 of the Standard Specifications, the following items are designated as "Specialty Items":

730-09-00100 Electrical System

809-01-00100 Movable Bridge Machinery

PROSECUTION OF WORK (06/13): Subsection 108.04, Prosecution of Work of the Standard Specifications as amended by the supplemental specifications thereto, is deleted and replaced by the following.

108.04(a) General

The contractor shall provide sufficient materials, equipment, and labor to complete the project in accordance with the plans and specifications within the contract time. If the completed work is behind the approved progress schedule, the contractor shall take immediate steps to restore satisfactory progress and shall not transfer equipment or forces from uncompleted work without prior notice to, and approval of, the engineer. Each item of work shall be prosecuted to completion

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without delay. If prosecution of the work is discontinued for an extended period of time, the contractor shall give the engineer written notice at least 24 hours before resuming operations.

108.04(b) Progress and Disqualification

The contractor's progress will be determined monthly at the time of each partial estimate, and will be based on the total amount earned by the contractor as reflected by the partial estimate. If the contractor's progress is more than 20 percent behind the elapsed contract time, the contractor may be notified that he is not prosecuting the work in an acceptable manner. If requested by the Department the contractor must meet with and provide the project engineer with an acceptable written plan which details how the contractor will regain lost progress and prosecute the remaining work.

A contractor shall be immediately disqualified when, on two or more projects, the contractor is in default in accordance with Subsection 108.09(a) and its progress on each such project is deficient by 10 percent or more. The contractor shall remain disqualified until only one overdue project remains incomplete and it has achieved final acceptance of the other project(s).

Should the surety or the Department take over prosecution of a project, the contractor shall remain disqualified for a period of one year from the completion of the project, unless the contractor is debarred.

A contractor may also be disqualified for other causes as provided elsewhere in the contract. During the period of disqualification, except as provided elsewhere, the contractor will not be permitted to bid on Department contracts nor be approved as a subcontractor on Department projects. Any bid submitted by the contractor during the period of disqualification will not be considered and will be returned.

108.04(c) Disqualification Review Board

After disqualification, the contractor may submit a written appeal to the Chief Engineer on construction projects, the Assistant Secretary, Office of Operations, on maintenance projects, or the District Administrator on district-let contracts for review by the appropriate Departmental Disqualification Review Board. The written appeal shall be submitted within 7 days, excluding weekends and holidays, after issuance of written notice of disqualification and the contractor may either request a meeting with the review board or that the review board consider a written appeal only. A meeting of the review board will be scheduled within 5 days, excluding weekends and holidays, after receipt of appeal.

The Department's headquarters review board will be composed of the Chief Engineer, or his designee, and five other members appointed by the Secretary. The Chief Engineer, or his designee, and two other members will constitute a quorum.

After all pertinent information has been considered, the contractor will be notified of the decision of the review board in writing within 5 days, excluding weekends and holidays. The decision of the review board will not operate as a waiver by the Department of its rights concerning the assessment of stipulated damages as specified under 108.08.

When the Department of Transportation and Development is not the contracting agency on a project, the contracting agency will make any disqualification determination and the contractor shall submit its appeal to the appropriate agency representative for that agency to address. The contracting agency will request that the Department concur with their decision prior to notifying

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the Contractor in writing. The DOTD's concurrence is advisory and will not make the DOTD a party to the contracting agency's construction contract.

PAYMENT ADJUSTMENT (05/06): Section 109, Measurement and Payment of the Standard Specifications is amended to add the following.

This project is not designated for payment adjustments for asphalt cements or fuels.

TEMPORARY TRAFFIC CONTROL (01/13): Section 713, Temporary Traffic Control of the 2006 Standard Specifications, and the supplemental specifications thereto is amended as follows:

Subsection 713.02 Materials is amended to substitute the following:

(b) Reflective Sheeting: Reflective sheeting requirements for temporary signs, barricades, channelizing devices, drums and cones shall comply with the following:

Section 1015.05(g).

TRAFFIC CONTROL MANAGEMENT (03/15): Subsection 713.08 of the 2006 Standard Specifications and the supplemental specifications is deleted and replaced with the following:

713.08 TRAFFIC CONTROL MANAGEMENT.

(a) Authorization: Prior to commencing work requiring traffic control management, the contractor shall submit to the engineer proof of the Traffic Control Supervisor's (TCS) and Traffic Control Technician's (TCT) current authorizations.

The Department will accept the TCS authorization of other approved agencies or firms only if all of the following minimum TCS requirements are met:

(1) Successful completion of a work zone traffic control supervisor course approved by the Department.

(2) Passing a written examination on the work zone traffic control supervisor course.

(3) A minimum of one (1) year full-time field experience, verified by the agency or firm, in work zone traffic control. This experience may be verified by the Department at its discretion.

(4) A TCS refresher course is required every four (4) years.

The Department will accept the TCT authorization of other approved agencies or firms only if all of the following minimum requirements are met.

(1) Successful completion of a work zone traffic control technician course approved by the Department.

(2) Passing a written examination on the work zone traffic control technician course.

(3) A TCT refresher course is required every four (4) years.

(b) Traffic Control Supervisor (TCS) Duties: The TCS's responsibility shall be traffic control management, and the TCS shall be available to the engineer to address traffic control management issues as needed. The following is a listing of the TCS's primary duties:

(1) The TCS shall personally provide traffic control management and supervision services at the project site. The TCS may have other assigned duties, but shall be readily available at all times to perform TCS duties as required in the contract. A minimum of one

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(1) TCT or TCS shall be required on site during working hours, except the following where a TCS shall be onsite at all times during working hours:

- freeways, expressways, and interstates
- multilane roads with posted speeds of 45 mph and greater
- other roadways with ADT equal to and greater than 25,000.

(2) The TCS shall be responsible for observing and evaluating both the day and night time performance of all traffic control devices installed on the project, in accordance with the Traffic Control Plan (TCP), to ensure that the devices are performing effectively as planned for both safety and traffic operations. This shall be done upon the initial installation of the devices and when any modifications and/or changes are made, in addition to the inspection of traffic control required in Heading (e).

(3) The TCS shall be responsible for revisions requested by the contractor to the traffic control plan established in the contract and shall submit the new traffic control plan in accordance with Heading (c).

(4) The TCS shall be responsible for the training of flagging personnel. This training will ensure that all flagging done on the project is in compliance with the MUTCD Part VI and Louisiana Work Zone Traffic Control Details. Flaggers shall be re-qualified every four (4) years.

(5) The TCS shall coordinate all traffic control operations for the duration of the contract, including those of subcontractors, utility companies, and suppliers, to ensure that all traffic control is in place and fully operational prior to the commencement of any work. The Department recognizes that the contractor does not have direct control over the traffic control operations of the utility companies. The coordination provided by the TCS when dealing with utility companies is specifically for the purpose of coordinating concurrent utility traffic control with any other construction traffic control to avoid conflicts.

(6) The TCS shall coordinate, in writing, all project activities with the appropriate law enforcement, fire control agencies, and other appropriate public agencies as determined at the pre-construction conference by the engineer. The TCS shall also invite the above agencies to the pre-construction conference.

(7) The Department in collaboration with the TCS, shall prepare and submit statements concerning road closures, delays, and other project activities to the news media on a weekly basis or more often as needed. News releases shall be submitted to the engineer for review and approval prior to the District's submittal to the news media.

(8) The TCS shall be responsible for notifying the engineer, or designee, immediately of all vehicular accidents and/or incidents related to the project traffic control. The time and date of notification shall be documented in the traffic control diary. The TCS shall also monitor and document queues that occur as necessary.

(9) The TCS assigned to the project shall attend the pre-construction conference and all project meetings.

(10) The TCS shall be responsible for the maintenance, cleanliness, replacement and removal of traffic control devices of the existing traffic control plan during working and non-working hours.

(c) Traffic Control Plan Revisions: Requests for revision in the traffic control plan must be made in writing to the engineer a minimum of fourteen (14) calendar days in advance of the needed revision. If the requested revision falls within the scope of the existing contract drawings, the engineer may approve the revision. If the engineer determines that the requested revision is outside the scope of the contract drawings, the contractor will be required to submit a change order. The change order drawings shall conform to the following:

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(1) Letter size original contract drawings --The change order drawings shall be submitted on high quality white 8 1/2 x 11 inch letter size paper. The drawings may be hand drafted or computer drafted and arranged in landscape format on the page. The text and drawings must be legible after reproduction on standard reproduction equipment. Left, bottom and right hand margins shall be at least 1/2 inch and the top margin shall be one (1) inch.

(2) Full size original contract drawings -- The change order drawings shall be submitted on high quality, 4-mil, double-matte film using a plotting or reproduction process that fuses the graphics to ensure durability. Repeated handling and friction due to stacking of plans shall not smear, flake or rub off the graphics. Improper plotter settings and plotter wear may cause inconsistent durability of the drawings. The contractor shall test samples of the submitted drawings for durability. Advance samples of matte films may be submitted for approval; however, the contract plans will be tested separately. Failures will result in rejection of the submittal. Drawing sizes shall be in accordance with Subsection 801.03(a).

Lettering on change order drawings shall be of adequate size to facilitate a fifty (50) percent reduction of plans. Additions or changes shall be made with a permanent type of waterproof ink made for this purpose. If revised cross sections are required, the cross-sections shall be plotted on standard plate cross-section sheets. The ground line, centerline elevation, and station numbers, as a minimum, shall be drawn in ink; the remaining information may be in pencil.

Regardless of size, all change order drawings and documents required shall be identified with the DOTD project title and project number. All plans and calculations shall be signed and sealed by a professional civil engineer currently registered to practice in Louisiana.

All plans submitted by the contractor shall conform to these specifications and standards. The DOTD Chief Engineer may reject any plans not conforming to these standards.

Revisions to the TCP that are determined to be outside the scope of the original contract drawings must be approved by the DOTD District Traffic Engineering Division prior to implementation of the requested revision. In some cases on high traffic routes or high priority projects, the revisions must be approved by the HQ Traffic Operations Engineer.

(d) Traffic Control Diary: The TCS shall maintain a project traffic control diary using the Department's Site Manager Program. The TCS shall be responsible, as a requirement of item 713, to keep the traffic control diary current on a daily basis and shall electronically sign each daily entry. A date stamp will appear on each diary, so it is imperative that these diaries be completed in a timely manner. Completion and maintaining of the daily diaries in accordance with the plans and specifications is subject to the Louisiana "Filing or Maintaining False Public Records" Law. Photographs and videotapes may be used to supplement the written text.

The traffic control diary shall be available at all times for inspection by the engineer. Failure to complete the diary on a daily basis shall result in a deduction of \$150 per day, from monthly estimate payments for the work, as stipulated damages for each day the diary is not completed or maintained. On days when the Department's Site Manager Program is unavailable, either due to location or operation, the TCS will be required to make arrangements with the approval of the Project Engineer to submit the TC diaries daily. Submitted diaries that indicate contemporary daily record keeping has not been maintained, as determined by the engineer, the Department's Work Zone Engineer or the Department's Statewide Traffic Control Specialist, shall result in a deduction of \$150 for each calendar day from the monthly estimate payments for the work. The traffic control diary is part of the pay item 713 and shall become the property of the Department at the completion of the project.

The contractor, with the approval of the engineer, the Department's Work Zone Engineer, or the Department's Statewide Traffic Control Specialist, may cease the requirement of a traffic control diary when:

- 1) The project has been partially accepted and/or no remaining work exists on the project site

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- that impacts the traveling public or
- 2) When all signs and barricades are removed at the conclusion of the project.

When referring to the daily completion of the diary, it is meant that the TCS shall complete the diary by the end of the following day with the following exceptions:

If the contractor does not work on Saturday, the Friday & Saturday diary shall be entered into SiteManager no later than Monday morning at 9am.

If the contractor works on Saturday, the Friday diary shall be entered by the end of the day Saturday, but the Saturday diary shall be entered no later than Monday 9am. The Sunday diary shall still be entered by the end of the day Monday.

(e) Inspection of Traffic Control: The TCS shall be responsible for the inspection of all traffic control devices every calendar day that traffic control devices are in use. This inspection may be delegated to the TCT, except per the conditions described in (b)(1) above, where the TCS shall conduct the inspections himself. Regardless, the TCS shall be stationed within one (1) hour of the jobsite. The “Quality Guidelines for Work Zone Traffic Control Devices” standard by the American Traffic Safety Services Association (ATSSA) shall be used to evaluate the condition of the traffic control devices to determine if acceptable for use. The TCS shall provide for the immediate repair, cleaning, or replacement of any traffic control devices not functioning as required to ensure the safety of the motorist and construction personnel and/or not meeting the ATSSA standard.

Inspection of the traffic control devices shall be conducted by the TCS at the beginning and end of each workday, and as scheduled or directed by the engineer during the workday. The traffic control devices shall be inspected by the TCS on weekends, holidays, or other non-work days at least once per day. Traffic control devices shall be inspected by the TCS at least once a week during nighttime periods and the same night after any modifications or changes have been made in the traffic control devices.

(f) Failure to Comply: The engineer, the Department’s Work Zone Engineer, or the Department’s Statewide Traffic Control Specialist may suspend all or part of the contractor’s operation(s) for failure to comply with the approved “Traffic Control Plan” or failure to correct unsafe traffic conditions within a reasonable period of time after such notification is given to the contractor in writing. If there are major traffic control deficiencies that require immediate corrective action for the safety of the travelling public, the engineer, the Department’s Work Zone Engineer, or the Department’s Statewide Traffic Control Specialist may completely suspend the contractor’s operations. This suspension can either be verbal or written, but shall be followed up in writing as soon as practical. The Department reserves the right to revoke or de-certify the TCS for gross neglect of his or her duties. The TCS at this point shall retake a Department approved TCS course and will be subject to a ninety (90) day probationary period at the discretion of the Department.

In the event that the contractor does not take appropriate action to bring the deficient traffic control into compliance with the approved traffic control plan or to correct the unsafe traffic conditions, the Department may proceed with the corrective action using its own forces, and such costs will be deducted from payments owed to the contractor.

If the contractor’s operations are suspended, the normal assessment of contract time will not cease for the period required to correct these unsafe conditions and traffic control deficiencies. The contractor shall not be relieved of the responsibility to provide traffic control safety to the traveling public when a project is under full or partial project suspension. When a project is under suspension due to the contractor’s failure to comply with this section, or when the contract is under stipulated damages, the contractor shall continue to provide traffic control management and no

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additional measurement or payment will be made. If suspensions or partial suspensions are requested by the contractor, the additional traffic control management costs will be at the contractor's expense.

(g) Engineer Modifications: The provisions included in the plans and specifications for handling and controlling traffic during construction may be changed by the engineer, with the approval of the DOTD District Traffic Operations Engineer, due to actual field conditions encountered. Such changes will be made by written instruction to the contractor and shall be considered an amendment to the plans and specifications as of the date of change.

STRUCTURAL METALS (08/15): Section 807, Structural Metals, of the 2006 Standard Specifications is amended as follows:

Subsection 807.04, MINIMUM SHOP REQUIREMENTS FOR FABRICATION OF STEEL STRUCTURES, is amended as follows:

Delete the fourth paragraph, and replace with the following two paragraphs:

Provide shops having sufficient enclosed floor spaces that allow oxygen cutting, air carbon arc gouging, assembly and welding to be performed inside, except that shop assembly of field connections for trusses, girders and arches may be performed outside the shop buildings with prior approval.

Use a fabrication shop possessing current AISC Structural Steel, AISC Component, and other certifications as required for the bridge elements being fabricated and type of work specified in the Contract. Provide the Chief Construction Engineer with documentation of all current fabricator certifications prior to beginning fabrication. Perform fabrication work requiring Departmental inspection at a location within the continental United States. Alternate certifications that exceed the requirements herein may be submitted to the Chief Construction Engineer for acceptance.

PAINTS (03/10):

Section 1008, Paints of the 2006 Standard Specifications is amended as follows.

Subsection 1008.05, Cold Galvanized Repair Compound is amended to delete the second paragraph and substitute the following:

Test panels coated with the compound shall be tested in a salt fog apparatus in accordance with ASTM B 117 for 1500 hours. The panels shall show no sign of rust, blistering, undercutting, delamination, or other deleterious properties when evaluated in accordance with ASTM B 117.

Subsection 1008.07, Zinc Paint Systems For New Structural Steel And 100 Percent Bare Existing Structural Steel is amended in the last table to remove the incorrect test procedure, ASTM D 2321 and replace it with the correct test method for X-Ray Diffraction and substitute the following:

X-Ray Diffraction ASTM D 5380

SIGNS AND PAVEMENT MARKINGS (06/14): Section 1015 Signs and Pavement Markings of the 2006 Standard Specifications and the supplemental specifications thereto is amended as follows:

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Subsection 1015.02, Metals, is amended as follows:

The first paragraph in subsection (a)(3), Steel Posts for Small Signs, Markers and Delineators, is deleted and replaced with the following:

- (a) U-Channel: Posts shall be steel of the flanged channel type shown on the plans, galvanized after fabrication in accordance with Subsection 811.12. Before fabrication, posts shall be within 3.5 percent of the specified weight (mass).

Subsection (b) Square Tubing for Small Signs, Markers, and Delineators is added as follows:

Sign posts shall be 2 inches (50 mm) x 2 inches (50 mm) x 14 gauge perforated square tubing for the upright sign post, 2 ¼ inches (56 mm) x 2 ¼ inches (56 mm) x 3 feet (1 m) x 12 gauge for the direct drive anchor (hard soil), and a 2 ¼ inches (56 mm) x 2 ¼ inches (56 mm) x 18 inch (minimum length) x 12 gauge Omni-Directional anchor with 4 inch x 12 inch x 10 gauge wings welded to all four corners with wings conforming to ASTM A659 for the direct drive anchor (soft soil, when specified in the plans).

The square tubing shall conform to ASTM A1011, Grade 50 for hot rolled carbon steel, structural quality. The average minimum tensile strength after cold-forming is 60,000 psi (415 MPa). The cross section of the square tubing shall be a square tube formed and carefully rolled to size and shall be welded by high frequency resistance welding and externally scarfed to agree with corner radii and dimensional tolerances shown in the plans or LADOTD Roadside Traffic Sign Standard Details. It shall be manufactured from hot-dipped galvanized steel conforming to ASTM A653/A653M-10, G90, Structural Quality, Grade 50, Class 1. The weld shall be hot zinc coated after the scarfing operation. The steel shall be coated with a chromate conversion coating and a clear organic polymer topcoat.

Subsection 1015.04 Sign Panels is deleted and replaced by the following:

- (a) Permanent Sign Panels: New and Recycled flat panels shall be 0.080 inch (2mm) thick aluminum sheets or plates complying with ASTM B 209, Alloy 6061-T6 or Alloy 5052-H38. New and recycled extruded aluminum panels shall comply with ASTM B 221 (ASTM B 221M), Alloy 6063-T6. Aluminum shall have a chromate conversion coating meeting ASTM B449 Class I or II., and after fabrication, have a flatness equal to or less than 0.031 inch per foot of length and 0.004 inch per inch of width.

- (b) Temporary Sign Panels: Substrate for barricade panels shall be either wood or rigid thermoplastic. Substrate for portable signs shall be new or recycled aluminum, wood or plastic. Substrate for post mounted signs shall be new or recycled aluminum, wood, rigid thermoplastic or aluminum clad low density polyethylene plastic.

- (1) Aluminum: Aluminum sheeting shall be 0.080 inch (2 mm) thickness complying with ASTM B 209 (ASTM B 209M), Alloy 6061-T6 or Alloy 5052-H38.

- (2) Wood: Plywood sheeting of exterior type Grades either High Density Overlay or Medium Density Overlay, are acceptable for use provided the following requirements are met.

Panels shall be a minimum of 5/8 inch (15 mm) thick and shall comply with the latest American Plywood Association specifications and be identified with the APA edge mark or back stamp to verify inspection and testing. Prior to application of reflective sheeting, the surface shall be abraded with steel wool or fine sandpaper, and wiped thoroughly clean. The surface shall be allowed to dry a minimum of 8 hours prior to application of sheeting. Cut edges of plywood panels shall be sealed with an approved aluminum pigmented polyurethane sealer.

- (3) Plastic: Plastic substrate for barricade panels and signs shall be as follows.

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a. Fiber Reinforced Vinyl (PVC): The substrate shall have a nominal composite thickness of 0.04 inches (1 mm) and be bonded to an approved retroreflective material by the manufacturer.

b. Rigid Thermoplastic: Rigid thermoplastic substrate shall consist of either High Density Polyethylene (HDPE) or High Density Polycarbonate (HDPC). The rigid thermoplastic for barricade panels shall be hollow core HDPE or HDPC with a minimum thickness of 0.625 inch (16 mm). The thermoplastic for sign panels shall be either 0.40 inch (10 mm) thick thin wall, fluted substrate or 0.625 inch (16 mm) thick blow molded substrate. Substrates shall be sufficiently rigid to maintain a flat face and shall be capable of attachment to the sign mounting in such a manner as not to crush or otherwise deform the substrate. Reflectorized sheeting applied to rigid thermoplastic shall have its manufacturer's approval for use on the substrate.

c. Aluminum Clad Low Density Polyethylene (AL/LDPE) Plastic: The aluminum clad low density polyethylene plastic substrate shall be 0.080 inch (2 mm) thick. The substrates shall be sufficiently rigid to maintain a flat face and shall be capable of attachment to the sign mounting in such a manner as not to crush or otherwise deform the substrate. Reflectorized sheeting applied to aluminum clad low density polyethylene shall have its manufacturer's approval for use on this substrate.

Subsection 1015.05 Reflective Sheeting is amended as follows:

The first paragraph in (a) is deleted and replaced by the following:

(a) Permanent and Temporary Standard Sheeting: Reflective sheeting shall be one of the following standard types as specified on the plans and complying with ASTM D 4956 except as modified herein. Permanent warning, regulatory, guide and supplemental guide sign sheeting shall meet the requirements of DOTD Type X as detailed below. Reflective sheeting for temporary signs and devices shall meet the requirements of ASTM D 4956 Type III except as noted in Subsection 1015.05(g). Reflective sheeting shall be an approved product listed in QPL 13.

The first paragraph in (g) is deleted and replaced by the following:

(g) Temporary Signs, Barricades, Channelizing Devices, Drums and Cones: Reflective sheeting for temporary signs, barricades and channelizing devices, shall meet the requirements of ASTM D 4956, Type III except that temporary advanced warning construction signs used on the mainline of freeways, expressways, and interstates shall be fluorescent orange and meet the requirements of DOTD Type X.

BARRICADE WARNING LIGHTS (11/11): Section 1018, Miscellaneous Materials of the 2006 Louisiana Standard Specifications for Roads and Bridges as amended by supplemental specifications is further amended as follows.

Subsection 1018.12, Barricade Warning Lights is deleted in its entirety and the following substituted:

1018.12 BARRICADE WARNING LIGHTS.

(a) General: Unless otherwise designated in the plans, barricade warning lights shall be Type A/C (switchable combination low-intensity flashing and steady burn), Type B (high-intensity flashing), or Type D (360-degree steady burn), and all bulbs shall be LED-type. Barricade warning lights shall be Qualified Brand Name products, (QPL 16), and comply with the MUTCD.

(b) Markings: Each light submitted for approval and each light placed on a project shall have a permanently attached identification plate or other permanent markings with the following information:

1 Manufacturer's name

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- 2 Model number
- 3 Type
- 4 Lens manufacturer and identification number
- 5 Circuit manufacturer and identification number
- 6 Bulb number
- 7 Minimum operating voltage required to conform to minimum intensity requirements
- 8 Year of manufacture

(c) Certification: Prior to installation, the contractor shall furnish the engineer with the following information:

- 1 Material certification (Certificate of Compliance)
- 2 Proposed number of warning lights to be used
- 3 Type
- 4 Trade name
- 5 Manufacturer's name and model number as contained in QPL 16

The certification shall also state that each light assembly has been tested, is functioning properly and will be maintained in satisfactory working order.

NS PORTABLE CHANGEABLE MESSAGE SIGN (PCMS) (03/12):

DESCRIPTION. This Item consists of furnishing and installing a solar powered trailer mounted portable changeable message sign (PCMS) and when required, with remote communications and video capability. The portable changeable message sign shall be used in conjunction with other traffic signs and devices in accordance with the plans, project specifications, and as directed by the Engineer.

GENERAL: The contractor shall furnish a working solar powered portable changeable message sign. All items that are required to provide an operational PCMS shall be supplied by the contractor whether listed above or not. The contractor shall field verify PCMS locations with the engineer. The sign must be designed in accordance with all applicable Manual on Uniform Traffic Control Devices (MUTCD) requirements as well as evaluated by the National Transportation Product Evaluation Program (NTPEP) for field performance (check www.ntpep.org for details).

Sign

The sign shall be mounted on a trailer with a telescoping lift system. The sign face shall utilize amber Light Emitting Diode (LED) technology which shall provide uniform lighting over the entire sign face. The LED brightness must be automatically adjusted to accommodate for prevailing ambient lighting conditions. The electrical system shall include adequate solar panels and batteries to power the sign and when required the wireless communications and the camera. All internally illuminated portions of the sign shall be amber in color. All other illuminated surfaces meant for message display shall be fluorescent yellow. All other surfaces on the front panel shall be flat black in color.

The PCMS shall consist of three separate lines. Each line shall consist of eight characters. Each character shall nominally be 18 inches (450 mm) in height. The width shall be adequate to meet the following legibility requirements. Each character shall be a 5 x 7 LED module or hybrid LED disk. The sign shall be clearly visible under all conditions and all lanes of travel from a distance of 1000 feet (300 m) perpendicular to the sign center. Characters shall be separated at a distance such that the legibility requirements are maintained. Determination of legibility distance shall rest

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solely with the Engineer; however, the contractor shall be responsible for maintaining this minimum legibility throughout the entire project.

Maintenance

The PCMS shall be stored in an approved secure storage area when not in use. The contractor shall be required to perform all maintenance operations recommended by the manufacturer and keep adequate records of such operations. The sign and unit shall be kept clean and in good repair at all times.

Communications

When required per the pay item, the PCMS shall be configured and provided with all necessary hardware for remote communications. The wireless communications shall use static Internet Protocol (IP) addressing through a wireless provider with adequate connectivity at the proposed sign locations for the entire length of time which they are operational. The wireless communications will allow the sign operator to monitor the message board status and program a new message to the PCMS via a remote Personal Computer (PC). The sign software shall have login security to prevent unauthorized use of the sign. Monthly service and data fees for the communications shall be the responsibility of the contractor.

Camera:

When required per the pay item, the PCMS shall be equipped with a pan, tilt, zoom (PTZ) Closed Caption Television (CCTV) Camera and remote communications. The camera shall be a day/night 360 degree PTZ environmental dome model, with heater and fan, a minimum 23X optical zoom and color picture, and low-light sensitivity black-and-white picture mode for night viewing. Camera elevation in operating position shall be 19 feet above grade.

The wireless communications shall allow remote control of the camera. Video images shall be transported via cellular router interface, which will allow for the transmission of Ethernet, serial-to-Ethernet conversion/transmission and USB data. The Department shall have full remote access to the camera controls and the video images.

MEASUREMENT.

All portable changeable message signs shall become the property of the contractor and removed upon completion of the project.

Measurement of the portable changeable message sign unit will be per each.

Measurement of the portable changeable message sign unit that includes remote communications will be per each.

Measurement of the portable changeable message sign unit that includes remote communications and a camera will be per each.

PAYMENT. Payment for the portable changeable message signs will be made at the contract unit price per each which will be full compensation for furnishing, operating, relocating and maintaining the unit during the life of the contract and includes all equipment, tools, labor, communication fees, and incidentals necessary for this item of work.

Payment will be made under:

<u>Item No.</u>	<u>Pay Item</u>	<u>Pay Unit</u>
NS-713-00008	Portable Changeable Message Sign	Each

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NS-MNT ITEMS: These items are described in the Technical Special Provisions as included elsewhere in the construction proposal and in the plans.

Payment will be at the contract unit price under the following:

NS-MNT-51001 INSTALLATION OF WALERS (DOTD FURNISHED)

CONTRACT TIME: The entire contract shall be completed in all details and ready for final acceptance in accordance with Subsection 105.17(b) within **sixty (60) working** days.

Prior to assessment of contract time, the contractor will be allowed 45 calendar days from the date stipulated in the Notice to Proceed to commence with portions of the contract work including but not limited to assembly periods, preparatory work for materials fabrications such as test piles, or other activities which hinder progress in the beginning stages of construction. Prior to issuance of the Notice to Proceed, the Department will consider extending the assembly period upon written request from the contractor justifying the need for additional time.

The contractor shall be responsible for maintenance of traffic from the beginning of the assembly period. During the assembly period, the contractor will be allowed to do patching and other maintenance work necessary to maintain the roadway with no time charges when approved by the engineer.

If the contractor begins regular construction operations prior to expiration of the assembly period, the assessment of contract time will commence at the time construction operations are begun.

**LOUISIANA
DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT
SUPPLEMENTAL SPECIFICATIONS
(FOR 2006 STANDARD SPECIFICATIONS)**

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**LOUISIANA
DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT
SUPPLEMENTAL SPECIFICATIONS**

The 2006 Louisiana Standard Specifications for Roads and Bridges and supplemental specifications thereto are amended as follows.

PART I – GENERAL PROVISIONS

SECTION 101 – GENERAL INFORMATION, DEFINITIONS, AND TERMS:

Subsection 101.03 – Definitions (07/07), Pages 3 – 13.

Delete the definition for “Proposal/Bid Guaranty” and substitute the following.

Proposal / Bid Guaranty. The required security furnished with a bid. The only form of security acceptable is a Bid Bond.

SECTION 102 – BIDDING REQUIREMENTS:

Subsection 102.09 – Proposal / Bid Guaranty (07/07), Page 19.

Delete the contents of this subsection and substitute the following.

PROPOSAL/BID GUARANTY. Each bid shall be accompanied by a proposal/bid guaranty in an amount not less than five percent of the total bid amount when the bidder’s total bid amount as calculated by the Department in accordance with Subsection 103.01 is greater than \$50,000. No proposal/bid guaranty is required for projects when the bidder’s total bid amount as calculated by the Department is \$50,000 or less. The official total bid amount for projects that include alternates is the total of the bidder's base bid and all alternates bid on and accepted by the Department. The proposal/bid guaranty submitted by the bidder shall be a bid bond made payable to the contracting agency as specified on the bid bond form provided in the construction proposal. No other form of security will be accepted.

The bid bond shall be on the "Bid Bond" form provided in the construction proposal, on a form that is materially the same in all respects to the "Bid Bond" form provided, or on an electronic form that has received Department approval prior to submission. The bid bond shall be filled in completely, shall be signed by an authorized officer, owner or partner of the bidding entity, or each entity representing a joint venture; shall be signed by the surety's agent or attorney-in-fact; and shall be accompanied by a notarized document granting general power of attorney to the surety's signer. The bid bond shall not contain any provisions that limit the face amount of the bond.

The bid bond will be written by a surety or insurance company that is in good standing and currently licensed to write surety bonds in the State of Louisiana by the Louisiana Department of Insurance and also conform to the requirements of LSA-R.S. 48:253.

All signatures required on the bid bond may be original, mechanical reproductions, facsimiles or electronic. Electronic bonds issued in conjunction with electronic bids must have written Departmental approval prior to use. The Department will make a listing of approved electronic sureties providers on the Bidx.com site.

non-plastic material, geotextile fabric, and undercut shall be at no additional cost to the Department.

Blended calcium sulfate will not be allowed in areas needed to facilitate traffic control or when a soil cement base course is specified in the plans. Blended calcium sulfate shall not be placed within 10 feet (3.0 m) of metal drainage structures. The contractor will be allowed to substitute any untreated Class II base course material listed in Subsection 302.01. Flowable fill under Section 710, or other approved backfill material in Section 701 shall be used to backfill the drainage structure.

Subsection 302.05 – Mixing (08/06) (12/08), Pages 152 and 153.

Delete the first sentence of Subheading (b)(1), In-Place Mixing, and substitute the following.

In-place mixing shall conform to Heading (a)(1) except that the percentage of Type I portland cement required will be 6 percent by volume.

Add Heading (d) as follows:

(d) Blended Calcium Sulfate: Calcium sulfate shall be blended with an approved aggregate or lime prior to placement. The blended calcium sulfate material shall be uniformly mixed and sampled from dedicated stockpiles. Gradation sampling in accordance with Subsection 1003.03 shall be taken from the dedicated stockpiles at the point of material origin.

Subsection 302.06 – Transporting and Placing on Subgrade (12/08), Page 154.

Add the following:

Water shall be added or other suitable means taken to prevent dust during the transporting and placing of dry blended calcium sulfate.

Subsection 302.07 - Compacting and Finishing (12/08), Pages 154 and 155.

Add Heading (e) as follows:

(e) Blended Calcium Sulfate: Blended calcium sulfate shall be placed and spread on the subgrade and compacted to produce layers not exceeding 12 inches (300 mm) compacted thickness. During placement the material shall be thoroughly wetted by application of water to maintain 2 to 4 percent above optimum moisture. After application of water, allow the moisture to reach equilibrium in the base before applying rolling techniques. Rolling of BCS is required to the edge of the embankment or subgrade. Each layer shall be compacted to at least 95 percent of maximum dry density or compacted by an approved established rolling pattern determined by the project engineer before the next layer is placed. Optimum moisture and maximum density shall be determined in accordance with DOTD TR 418 Method G modified to include a maximum drying temperature of 140°F (60°C).

Add Heading (f) as follows:

(f) Proof Rolling: Proof rolling shall be done by a load of 25 tons (25 Mg) in a 12 to 14 cubic yard (9 to 10.5 cubic meters) tandem dump truck with ten wheels or approved loaded truck

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determined by the project engineer. Proof rolling shall be a minimum of 5 passes in each direction at the same locations and at a maximum vehicle speed of 3 mph (4.8 km/h).

All BCS base will be tested by proof rolling prior to placement of surfacing material, including asphalt binder. Any irregularities or soft spots shall be corrected prior to placement of the surfacing material. Any rain event on the project site between the proof rolling and placement of the surfacing will require an additional proof rolling as noted above.

Subsection 302.09 – Protection and Curing (12/08), Page 155.

Add Heading (c) as follows:

(c) Blended Calcium Sulfate: Protection and curing of blended calcium sulfate shall be in accordance with Subsection 302.09(b).

Subsection 302.12 – Acceptance Requirements (12/08), Pages 156 – 161.

Add the following to Heading (a):

The acceptance requirements for blended calcium sulfate base course shall be the same as stone base course with the following modifications. Upon completion of compaction operations, the density will be determined in accordance with DOTD TR 401 except that all moisture content determinations for density calculations shall be conducted by oven drying the material for 24 hours at 140°F (60°C). A forced draft type oven capable of maintaining the temperature shall be provided by the contractor for field moisture content determination for density control.

SECTION 305 – SUBGRADE LAYER:

Subsection 305.06 – Payment (01/08), Page 184.

Delete this subsection and substitute the following.

305.06 Payment. Payment for subgrade layer will be made at the contract unit price which includes lime, lime treatment, cement, cement treatment, water, stone, recycled portland cement concrete, crushed slag, blended calcium sulfate, asphaltic concrete, and asphalt curing membrane or prime coat, subject to the payment adjustment provisions of Section 1002 for specification deviations of asphalt materials and Subsection 303.11(a) for density deficiencies of cement treated materials. Adjustments in pay for increase or decrease in the percent cement ordered by the engineer will be in accordance with Subsection 303.13. Adjustments in pay for increase or decrease in the percent lime ordered by the engineer will be based on the price of lime shown on paid invoices (total of all charges). The Materials and Testing Section will provide the payment adjustment percentage for properties of asphalt materials.

Payment for geotextile fabric will be included in the contract unit price for subgrade layer. Payment will be made under:

Item No.	Pay Item	Pay Unit
305-01	Subgrade Layer _____in (mm) Thick	Square Yard (Sq m)

SECTION 307 – PERMEABLE BASES:

Subsection 307.02 – Materials (09/07), Pages 187 and 188.

Delete Heading (b), Asphalt and substitute the following.

(b) Asphalt: The asphalt for asphalt treated permeable base shall be an approved polymer modified asphalt cement, PG 76-22m, or PG 82-22rm complying with Section 1002. The percentage of asphalt cement shall be 2.0 percent to 4.0 percent by weight (mass) of the total mixture. Asphalt cement content and mixing process shall be such that all aggregates are visibly coated. The mixture shall retain 90 percent coating when tested in accordance with DOTD TR 317.

A job mix formula shall be submitted and approved in accordance with Section 502.

SECTION 308 – IN-PLACE CEMENT TREATED BASE COURSE:

All Subsections within Section 308 – (07/07), Pages 191 – 198.

Whenever the reference to “DOTD TR-432, Method D” is used, it shall mean “DOTD TR-432”.

PART V – ASPHALTIC PAVEMENTS

SECTION 502 – SUPERPAVE ASPHALTIC CONCRETE MIXTURES:

Subsection 502.02 – Materials (08/06) (11/07), Pages 210 – 213.

Delete Table 502-2, Superpave Asphalt Cement Usage under Subheading (a) and substitute the following.

Table 502-2
Superpave Asphalt Cement Usage

Current Traffic Load Level	Mixture Type	Grade of Asphalt Cement
Level 1	Wearing Course	PG 70-22m
	Binder Course	PG 70-22m
	Base Course	PG 64-22
Level 2	Wearing Course	PG 76-22m
	Binder Course	PG 76-22m
Level A	Incidental Paving	PG 70-22m

Note: A PG 82-22 rm, Waste Tire Rubber Modified Asphalt, may be substituted for any other grade of asphalt cement.

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Delete Table 502-3, Aggregate Friction Rating under Subheading (c)(1) and substitute the following.

Table 502-3
Aggregate Friction Rating

Friction Rating	Allowable Usage
I	All mixtures
II	All mixtures
III	All mixtures, except travel lane wearing courses with plan ADT greater than 7000 ¹
IV	All mixtures, except travel lane wearing courses ²

¹ When plan current average daily traffic (ADT) is greater than 7000, blending of Friction Rating III aggregates and Friction Rating I and/or II aggregates will be allowed for travel lane wearing courses at the following percentages. At least 30 percent by weight (mass) of the total aggregates shall have a Friction Rating of I, or at least 50 percent by weight (mass) of the total aggregate shall have a Friction Rating of II. The frictional aggregates used to obtain the required percentages shall not have more than 10 percent passing the No. 8 (2.36 mm) sieve.

² When the average daily traffic (ADT) is less than 2500, blending of Friction Rating IV aggregates with Friction Rating I and/or II aggregates will be allowed for travel lane wearing courses at the following percentages. At least 50 percent by weight (mass) of the total aggregate in the mixture shall have a Friction Rating of I or II. The frictional aggregates used to obtain the required percentages shall not have more than 10 percent passing the No. 8 (2.36 mm) sieve.

Subsection 502.14 – Lot Sizes (11/07), Pages 232 and 233.

Delete the first sentence of the first paragraph and substitute the following.

A lot is a segment of continuous production of asphaltic concrete mixture from the same job mix formula produced for the Department at a specific plant, delivered to a specific DOTD project.

SECTION 508 – STONE MATRIX ASPHALT:

Subsection 508.01 – Description (09/07), Page 274.

Delete this subsection and substitute the following.

508.01 DESCRIPTION. This work consists of furnishing and constructing Stone Matrix Asphalt (SMA) which is a plant mixed asphalt concrete wearing course for high traffic applications. This mixture is a rut resistant hot mix design with stone on stone contact. The mixture shall be composed of a PG 76-22m, or PG 82-22rm asphalt cement and a gap graded coarse aggregate structure. Mineral filler and/or fibers shall be used to control draindown. This work shall be in accordance with these specifications, plan details, and as directed. All requirements of Section 502 apply to Stone Matrix Asphalt, except as modified herein. All plant and paving equipment and processes must meet the requirements of Section 503.

Mixture used for shoulder may be Stone Matrix Asphalt or any mixture type shown in Table 502-5.

Subsection 508.02 – Materials (09/07), Page 274.

Delete the contents of Subheading (a), Asphalt Cement and substitute the following.

(a) Asphalt Cement: Asphalt cement shall be PG 76-22m, or PG 82-22rm as listed on QPL 41 and complying with Section 1002.

PART VI – RIGID PAVEMENT

SECTION 602 – PORTLAND CEMENT CONCRETE PAVEMENT

REHABILITATION:

Subsection 602.17 – Payment (09/07), Pages 341 – 344.

Delete the last paragraph of Subheadings (d), Full Depth Corner Patching of Jointed Concrete Pavement, (e) Full Depth Patching of Jointed Concrete Pavement, and (g) Patching Continuously Reinforced Concrete Pavement, and substitute the following.

Payment for deteriorated base course removed as directed by the engineer and replaced with concrete will be made as follows: The value per inch (mm) thickness will be determined by dividing the contract unit price per square yard (sq m) by the plan thickness. Thickness of patches will be measured from the surface that exists at the time of patching. Payment for the additional thickness will be made at 50 percent of the value per inch (mm) thus determined.

PART VII – INCIDENTAL CONSTRUCTION

SECTION 701 – CULVERTS AND STORM DRAINS:

All Subsections within Section 701 (08/07), Pages 347 – 358.

Delete Section 701, Culverts and Storm Drains and substitute the following.

SECTION 701
CULVERTS AND STORM DRAINS

701.01 DESCRIPTION. This work consists of furnishing, installing, and cleaning pipe, pipe arch, storm drains and sewers, also referred to as culverts or conduit, in accordance with these specifications and in conformity with lines and grades shown on the plans or established.

701.02 MATERIALS. Materials shall comply with the following sections and subsections:

Usable Soil	203.06(a)
Selected Soil	203.06(b)
Plastic Soil Blanket	203.10
Mortar	702.02
Flowable Fill	710
Portland Cement Concrete	901
Reclaimed Asphaltic Pavement (RAP)	1003.01 & 1003.04(d)
Stone	1003.03(b)
Recycled Portland Cement Concrete	1003.03(c)

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Granular Material	1003.07
Bedding Material	1003.08
Concrete Sewer Pipe	1006.02
Reinforced Concrete Pipe	1006.03
Reinforced Concrete Pipe Arch	1006.04
Gasket Materials	1006.06
Plastic Pipe	1006.07
Split Plastic Coupling Bands	1006.07(d)(4)
Plastic Yard Drain Pipe	1006.09
Bituminous Coated Corrugated Steel Pipe and Pipe Arch	1007.02
Structural Plate for Pipe, Pipe Arch and Arch	1007.04
Corrugated Aluminum Pipe and Pipe Arch	1007.05
Coupling Bands	1007.09
Reinforcing Steel	1009
Geotextile Fabric	1019

(a) Side Drain Pipe or Side Drain Pipe Arch: When the item for Side Drain Pipe or Side Drain Pipe Arch is included in the contract, the contractor has the option of furnishing reinforced concrete pipe or reinforced concrete pipe arch, corrugated metal pipe or corrugated metal pipe arch, or plastic pipe, as allowed by EDSM II.2.1.1 or unless otherwise specified.

(b) Cross Drain Pipe or Cross Drain Pipe Arch: When the item for Cross Drain Pipe or Cross Drain Pipe Arch is included in the contract, the contractor has the option of furnishing reinforced concrete pipe or reinforced concrete pipe arch, corrugated metal pipe or corrugated metal pipe arch, or plastic pipe, as allowed by EDSM II.2.1.1 or unless otherwise specified.

(c) Storm Drain Pipe or Storm Drain Pipe Arch: When the item for Storm Drain Pipe or Storm Drain Pipe Arch is included in the contract, the contractor has the option of furnishing reinforced concrete pipe or reinforced concrete pipe arch, or plastic pipe, as allowed by EDSM II.2.1.1 or unless otherwise specified.

(d) Yard Drain Pipe: When the item for Yard Drain Pipe is included in the contract, the contractor has the option of furnishing concrete sewer pipe, plastic yard drain pipe or plastic pipe in accordance with Section 1006 unless otherwise specified.

(e) Material Type Abbreviations:

(1) Reinforced Concrete Pipe:

RCP	Reinforced Concrete Pipe
RPCA	Reinforced Concrete Pipe Arch

(2) Corrugated Metal Pipe:

CAP	Corrugated Aluminum Pipe
CAPA	Corrugated Aluminum Pipe Arch
CMP	Corrugated Metal Pipe
CMPA	Corrugated Metal Pipe Arch
CSP	Corrugated Steel Pipe
CSPA	Corrugated Steel Pipe Arch

BCCSP	Bituminous Coated Corrugated Steel Pipe
BCCSPA	Bituminous Coated Corrugated Steel Pipe Arch

(3) Plastic Pipe:

PP	Plastic Pipe
PVCP	Polyvinyl Chloride Pipe
RPVCP	Ribbed Polyvinyl Chloride Pipe
CPEPDW	Corrugated Polyethylene Pipe Double Wall

(f) Joint Type Abbreviations:

T1	Type 1 Joint
T2	Type 2 Joint
T3	Type 3 Joint

(g) Quality Assurance for Pipe: Manufacturing plants will be periodically inspected for compliance with specified manufacturing methods, and material samples will be randomly obtained for laboratory testing for verification of manufacturing lots. Materials approved at the manufacturing plant will be subject to visual acceptance inspections at the jobsite or point of delivery.

701.03 EXCAVATION. For all pipe, when the sides of the trench are stable as evidenced by the sides of the trench being able to maintain a vertical cut face, the minimum trench width at the bottom of the excavation will be 18 inches (460mm) on either side of the outside diameter of the pipe. If the sides of the trench are unstable, the width of the trench at the bottom of the excavation, for plastic or metal pipe, shall be a minimum width of at least 18 inches (460mm) or one pipe diameter on each side of the outside diameter of the pipe, which ever is greater. Surplus material or excavated material that does not conform to the requirements of Subsection 203.06(a) shall be satisfactorily disposed of in accordance with Subsection 202.02. Moisture controls including backfill materials selection and dewatering using sumps, wells, well points or other approved processes may be necessary to control excess moisture during excavation, installation of bedding, over-excavated trench backfilling, pipe placement and pipe backfill.

(a) Over-excavation: When unsuitable soils as defined in Subsection 203.04 or a stable, non-yielding foundation cannot be obtained at the established pipe grade, or at the grade established for placement of the bedding, unstable or unsuitable soils below this grade shall be removed and replaced with granular material meeting the requirements of Subsection 1003.07, bedding materials meeting the requirements of Subsection 1003.08 or Type A backfill. All granular, backfill materials placed below the established pipe or bedding grade shall be placed in lifts not exceeding 8 inches (200 mm) thick and sufficiently compacted by hand or a dynamic mechanical hand compaction device over the surface of each lift to form a stable, non-yielding foundation at the surface of the established bedding or pipe grade.

When rock is encountered, it shall be removed below grade and replaced with material complying with Subsection 1003.07, bedding materials meeting the requirements of Subsection 1003.08 or Type A backfill. The compacted earth cushion shall have a thickness under the pipe of at least 1/2 inch per foot (40 mm/m) of fill height over the top of the pipe with a minimum thickness of 8 inches (200 mm). All granular, backfill materials placed below the established pipe or bedding grade shall be placed in lifts not exceeding 8 inches (200 mm) thick and

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sufficiently compacted by hand or a dynamic mechanical hand operated compaction device over the surface of each lift to form a stable, non-yielding foundation at the surface of the established bedding or pipe grade.

Materials used to backfill in an over-excavated portion of a trench do not require encasement in a Geotextile Fabric.

Density of approved materials placed in over-excavated trenches will not be measured or determined.

701.04 FORMING PIPE BED. Bedding material, when specified, shall be constructed in accordance with Section 726. Materials allowed for bedding shall be as specified in Subsection 1003.08 or may be Type A backfill materials. When bedding materials are specified, additional excavation shall be performed below established pipe grade and the bedding material placed in lifts not exceeding 8 inches (200 mm) thick and lightly compacted by hand or a dynamic hand compaction device over the surface of each lift.

When the bottom of the pipe is not laid in a trench but is constructed above natural soils, a uniform bed shall be constructed as specified for the bottom of a trench.

Density of approved bedding materials will not be measured or determined.

701.05 LAYING PIPE. Pipe laying shall begin at the downstream end of the line. The pipe shall be in contact with the foundation throughout its length. Bell or groove ends of pipe and outside circumferential laps of riveted metal pipe shall be placed facing upstream. Riveted seam metal pipe shall be placed with longitudinal laps at sides. Pipes in each continuous line shall have the same wall thickness. Metal pipes provided with lifting lugs shall be handled only by these lugs.

After pipe has been laid and before backfill is placed, the engineer will inspect the pipe for alignment, grade, integrity of joints, and coating damage.

701.06 JOINING PIPE.

(a) Joint Usage:

(1) Type 1 (T1) joints shall be used for side drains under drives and similar installations.

(2) Type 2 (T2) joints shall be used for cross drains under roadways, including turnouts.

(3) Type 3 (T3) joints shall be used for closed storm drain systems, flumes and siphons.

(b) Concrete Pipe: Concrete pipe may be either bell and spigot, or tongue and groove. The method of joining pipe sections shall be such that ends are fully entered and inner surfaces are flush and even.

An approved mechanical pipe puller shall be used for joining pipes over 36 inches (900 mm) in diameter. For pipe 36 inches (900 mm) or less in diameter, any approved method for joining pipe may be used which does not damage the pipe.

Joints shall comply with Subsection 1006.05, and shall be sealed with gasket material installed in accordance with the manufacturer's recommendations.

(c) Metal Pipe: Metal pipe shall be firmly joined by coupling bands. Bands shall be centered over the joint.

For Type 1 joints, approved gasket material shall be placed in one corrugation recess on each side of the joint at the coupling band and on each band connection in such manner to prevent leakage.

When Type 2 or 3 joints are specified, joining of metal pipe sections shall conform to the following provisions:

(1) General: Band joints shall be sealed with gasket material. Gasket material shall be placed in accordance with the plan details.

(2) Circular Section: Connecting bands shall be of an approved design and shall be installed in accordance with plan details.

(3) Arch Section: Connecting bands shall be a minimum of 12 inches (300 mm) wide for pipe arch less than 36 inches (900 mm) round equivalent diameter, and a minimum of 21 inches (525 mm) wide for 36 inches (900 mm) round equivalent diameter pipe arch and greater. Bands shall be connected at the ends by approved angle or strap connections. Connecting bands used for 36 inches (900 mm) round equivalent diameter pipe arch and above shall be 2-piece bands.

(d) Plastic Pipe: Joints for plastic pipe shall be either bell and spigot or split coupling bands.

(1) Bell and Spigot Type Joint System: The method of joining pipe sections shall be such that ends are fully entered and inner surfaces are flush and even.

Any approved method for joining pipe may be used which does not damage the pipe.

Joints shall be approved and shall be sealed with a gasket system utilizing gasket material complying with Subsection 1006.06(a).

(2) Split Coupling Type Joint System: Split coupling bands shall comply with all dimensional and material requirements of Subsection 1006.07. The bands shall be centered over the joint. The split coupling band shall be secured to the pipe with a minimum of five stainless steel or other approved corrosion resistant bands.

Joints shall be approved and shall be sealed with gasket material. Gasket material shall be placed in the first two corrugation recesses on each side of the pipe connections. Gasket material shall also be placed on each band connection to prevent leakage. When flexible plastic gasket material is used it shall be a minimum of 1/2 inch (13 mm) in size. The bands shall be tightened to create overlap of the band and shall adequately compress the gasket material.

(e) Connections: Approved connections shall be used when joining new pipes to existing pipes. When concrete collars are required in order to extend the ends of existing pipes that have been damaged or to join different types or sizes of pipes, the concrete collars shall be constructed in accordance with plan details, the applicable requirements of Section 901, and as directed.

(f) Geotextile Fabric, Pipe Joints: For concrete, metal and plastic pipes, Types 2 and 3 joints shall be wrapped with geotextile fabric for a minimum of 12 inches (300 mm) on each side of joint for pipe 36 inches (900 mm) or less in diameter and a minimum of 18 inches (450 mm) on each side of the joint for pipe greater than 36 inches (900 mm) in diameter. Ends of the fabric shall be lapped at least 10 inches (250 mm). The edges and ends of fabric shall be suitably secured for the entire circumference of the pipe.

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701.07 RELAYING PIPE. If specified or directed, existing pipes shall be removed and suitable sections relaid as specified for new pipes.

701.08 BACKFILLING.

(a) General: Prior to backfilling, pipes found to be damaged or out of alignment or grade shall be removed and reinstalled, or replaced.

Type A backfill material shall be stone, recycled portland cement concrete, flowable fill, or RAP.

Type B backfill materials are selected soils. Where Type B backfill materials are called for, Type A backfill materials may be substituted.

When corrugated metal pipe is used, the backfill material shall be tested and shall have a resistivity greater than 1500 ohm-cm and a pH greater than 5 when tested in accordance with DOTD TR 429 and DOTD TR 430 respectively.

When Type A backfill material is used, geotextile fabric surrounding this backfill shall be placed in accordance with Subsection 726.03 between the aggregate backfill material and all other natural or placed soils in the trench or embankment. Care shall be taken to prevent damage to geotextile fabric during placement of backfill material. For concrete pipe, the fabric shall enclose not only the initial backfill but shall be wrapped over the top of the pipe with at least 12 inches (300 mm) of overlap.

When a trench box or trench sheeting is used in unstable soils and/or for worker safety, and when moved during backfilling operations, filling and additional compaction of the disturbed zone of backfill must take place immediately and in a manner acceptable to the engineer.

Initial backfill is a structural backfill encasing the pipe from the bottom of the pipe to the springline for concrete pipe and to a point one foot (0.3 m) above the top of the pipe for both metal and plastic pipe. Final backfill is not a structural backfill and shall extend from the top of the initial backfill to the top of the natural ground or subgrade in cut areas or to the top of existing ground in fill areas. Any fill required above the final backfill is considered and treated as embankment.

(b) Backfill Applications: For projects using A+B+C bidding method where rigid and flexible pavement alternates are considered, backfill application (2) below, "Cross Drains Under Flexible Pavements", shall apply for either rigid or flexible pavements.

(1) Under Concrete Pavements: Type B backfill may be used as initial and final backfill for all pipes, culverts or drains under concrete pavements. Placement and compaction shall be as specified in Heading (d) below.

(2) Cross Drains Under Flexible Pavements: All reaches, exclusive of those portions of the pipe which are under shoulders, of cross drains and all other culverts, pipes or drains that cross the centerlines of the new roadway or centerlines of existing roadways, such as intersections and are under flexible pavements shall receive an initial backfill of Type A material. Type B backfill materials may be used as final backfill for all pipes. Placement and compaction shall be as specified in Heading (c) and (d) below. Where the subgrade is above existing ground, embankment material as specified for the remainder of the project shall be used from the top of the final backfill to the top of the established embankment grade.

(3) Other Drains Under Flexible Pavements: All reaches of all culverts, pipes or drains under flexible pavements that do not cross the centerlines of new roadway or centerlines of existing roadways, and exclusive of those portions of the pipe which are totally under shoulders, shall receive an initial and final backfill of Type B material. Placement and compaction shall be as specified in Heading (d) below. Where the subgrade is above existing ground, embankment material as specified for the remainder of the project shall be used from the top of the final backfill to the top of the established embankment grade.

(4) Other Areas: All culverts, pipes or drains in nonpaved areas or paved areas that serve as driveways or shoulders shall receive an initial and final backfill of Type B material. Placement and compaction shall be as specified in Heading (d) below.

(5) Pipes Subject to Construction Traffic; The embankment or pipe backfill shall be constructed to a minimum of 24 inches (600 mm) over the pipe before heavy construction equipment is allowed to cross the installation. Where practical, installations with less than 24 inches (600 mm) of cover over the top of the pipe shall be constructed after heavy hauling is completed over the pipe location. After completion of hauling operations, the contractor shall remove excess cover material. Pipe damaged by hauling and backfilling operations shall be removed and reinstalled, or replaced, at no direct pay.

(c) Placement and Compaction; Type A Backfill: For all pipes, culverts and conduits under paved and nonpaved areas, where Type A backfill material is used, the Type A backfill shall be thoroughly hand compacted under the pipe haunches and then dynamically compacted in layers not exceeding 8 inches (200 mm) compacted thickness. Compaction under the haunches of the pipe shall initially be by hand tamping or other acceptable means, until a level is reached that the dynamic tamping can commence. Each lift shall be compacted by applying at least eight passes of a hand operated, dynamic mechanical compaction device over the surface of each lift. With approval of the engineer, layer thickness may be increased to 12 inches (300 mm) with verification of satisfactory installation and performance. If flowable fill is used it shall be furnished, placed and consolidated in accordance with Section 710. The contractor shall control placement operations during initial backfill operations so as not to damage protective coatings on metal pipes. The contractor shall repair damaged coatings at no additional pay.

(d) Placement and Compaction; Type B Backfill: For all pipes, culverts and conduits, where Type B backfill is allowed, the Type B material shall be placed in layers not exceeding 8 inches (200 mm) compacted thickness. Compaction shall be with suitable mechanical equipment. With approval of the engineer, layer thickness may be increased to 12 inches (300 mm) with verification of satisfactory installation and performance.

(e) Placement and Compaction; Trenchless or Partial Trench Condition: All pipes, culverts, drains and conduits placed with any portion of the pipe above existing ground must also comply with Subsections (a),(b) (c) and (d) above for the portion of the pipe within a trench and that portion of the pipe not constructed in a trench. The width of initial and final backfill of that portion above existing ground and not within a trench will be constructed to such a width that the requirements for placement, compaction and density are met.

(f) Density Requirements: The in place density of Type A backfill materials and bedding materials, will not be measured or determined. Type A backfill, exclusive of RAP and flowable

fill, shall be placed at or near optimum moisture content determined in accordance with DOTD TR 415 or 418. RAP materials shall be placed and compacted in a slightly moist condition.

The maximum dry density of initial or final Type B backfill under all paved areas which are to be under traffic will be determined in accordance with DOTD TR 415 or TR 418 and in-place density determined in accordance with DOTD TR 401. Initial and final Type B backfill under all paved areas, under traffic, shall be placed at or near optimum moisture content determined in accordance with DOTD TR 415 or TR 418. Each layer shall be compacted by approved methods prior to the placement of a subsequent layer. The engineer will approve the compaction method based upon validation that such method, including moisture control, will achieve at least 95 percent of maximum dry density as determined in accordance with DOTD TR 401. With approval of the engineer, density testing may be waived on subsequent layers with backfill installation in accordance with approved compaction methods and continued satisfactory performance.

Initial and final backfill in unpaved areas or paved areas such as shoulders or driveways, shall be placed evenly and compacted along the length of the culvert, pipe or drain from the top of the initial backfill to the top of the subgrade. Layered backfill shall be compacted at least to the density of the adjoining existing soils or the compaction required of the laterally adjoining layers of soil immediately outside the trench for embankment elevations. Initial and final backfill shall be placed and compacted at or near optimum moisture content determined in accordance with DOTD TR 415 or TR 418.

701.09 INSPECTION OF PIPES. After completion of embankment and prior to roadway surfacing, the engineer shall inspect pipes for proper alignment and integrity of joints. Any misaligned pipe or defective joints shall be corrected by the contractor at no direct pay.

(a) Plastic Pipe: Installed plastic pipe shall be tested to ensure that vertical deflections do not exceed 5.0 percent. Maximum allowable deflections shall be governed by the mandrel requirements stated herein.

Deflection tests shall be performed no sooner than 30 calendar days after installation and compaction of backfill. The pipe shall be cleaned and inspected for offsets and obstructions prior to testing.

For pipe 36 inches (900 mm) and less in diameter, a mandrel shall be pulled through the pipe by hand to ensure that maximum allowable deflections have not been exceeded. The mandrel shall be approved by the engineer prior to use. Use of an unapproved mandrel or a mandrel altered or modified after approval will invalidate the test. If the mandrel fails to pass, the pipe is overdeflected.

Unless otherwise permitted, overdeflected pipe shall be uncovered and, if not damaged, reinstalled. Damaged pipe shall not be reinstalled, but shall be removed and replaced with new pipe. Any pipe subjected to any method or process other than removal, which attempts, even successfully, to reduce or cure any overdeflection, shall be removed and replaced with new pipe.

The mandrel shall be a rigid, nonadjustable, odd-numbered legged (minimum 9 legs) mandrel having a length not less than its nominal diameter or 24 inches (600 mm), whichever is less. The minimum diameter at any point shall be 5.0 percent less than the base inside diameter of the pipe being tested. The mandrel shall be fabricated of steel, aluminum or other approved

material fitted with pulling rings at each end. The nominal pipe size and outside diameter of the mandrel shall be stamped or engraved on some segment other than a runner. A suitable carrying case shall be furnished.

For pipe larger than 36 inches (900 mm) in diameter, deflection shall be determined by a method approved by the engineer. If a mandrel is selected, the minimum diameter, length, and other requirements shall conform to the above requirements.

Mandrel testing shall be conducted by the contractor in the presence of the engineer. Mandrel testing shall be at no direct pay.

(b) Metal Pipe: If the inside diameter of metal pipe or rise dimension of metal pipe arch deflects more than 5.0 percent from original dimensions, they shall be removed and reinstalled, unless they do not rebound or are damaged. Pipe or pipe arch which are damaged or do not rebound shall be removed and replaced at no direct pay. Measurement of deflection will be made by the engineer away from rerolled ends.

701.10 CLEANING PIPES.

(a) Existing Pipes: Pipes designated to be cleaned shall be cleaned of soil, debris and other materials to the invert of the pipe. Designated pipes shall be cleaned by approved methods that will not damage the pipes. Any damage caused by the contractor's operations shall be satisfactorily repaired at no direct pay.

Removed soil, debris and other materials shall be disposed of in accordance with Subsection 202.02 or as otherwise approved in writing.

(b) Contractor Installed Pipes: Prior to final acceptance, pipes shall be cleaned of all debris and soil to the invert of the pipe at no direct pay.

Removed soil, debris and other materials shall be disposed of in accordance with Subsection 202.02 or as otherwise approved in writing.

701.11 STUBBING AND PLUGGING PIPES. When it is required that pipes be plugged, such plugs shall be constructed of Class R concrete complying with Section 901. Thickness of plug and method of construction shall be as directed.

When new pipes are to be stubbed into new or existing pipes or other structures, the connection shall be made with approved mortar complying with Subsection 702.02.

701.12 MEASUREMENT. Pipe, both new and relaid, will be measured in linear feet (lin m) as follows unless stated otherwise.

(a) Pipe not confined by fixed structures will be measured by the number of joints at the nominal length of each joint.

(b) Pipe confined by fixed structures will be measured along the pipe between the termini of pipe in structure walls.

(c) Pipe confined by a fixed structure on one end and unconfined at the other end will be measured along the pipe from the terminus of pipe in the structure wall to the unconfined end of pipe.

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(d) Fabricating of pipe tees, elbows and other fittings will be measured per each fitting. The length of pipe in such fittings will be included in the pay length measurement of pipes of which they form a part.

(e) Excavation required for installation of pipes will not be measured for payment, except as otherwise specified in Subsection 203.14.

(f) Furnishing and placing backfill material below existing ground level for pipes will not be measured for payment. Backfill material needed to complete backfill above natural ground and around pipes that extend above natural ground will be measured and payment will be made under applicable earthwork items. When specified, flowable fill will be measured and paid for in accordance with Section 710.

(g) Plugging and stubbing of pipes will not be measured for payment.

(h) Cleaning existing pipes will be measured by the length of pipe cleaned and accepted.

(i) Concrete collars will be measured per each.

701.13 PAYMENT.

(a) Payment for pipe will be made at the contract unit price per linear foot (lin m) of the types and sizes specified.

When plastic pipe is specified on the plans or elected to be used by the contractor, payment will be made at the contract unit price per linear foot (lin m) of the types and sizes specified in accordance with the payment schedule of Table 701-1.

Table 701-1
 Payment Schedule for Plastic Pipe

Percent Payment	Stage of Completeness
75	After placement and backfill has been completed
25	After the pipe has met vertical deflection requirements in accordance with Subsection 701.09(a)

(b) Payment for fabricating pipe tees, elbows and other fittings will be made at the contract unit price per each fitting.

(c) When unstable conditions are encountered, the additional excavation will not be measured for payment; however, the additional materials furnished and placed for the pipe foundation will be measured and paid for as follows:

(1) Granular Materials: Payment will be made under the embankment item. The net section volume of the materials will be multiplied by 3 to determine the pay volume. When the contract does not include a pay item for embankment, payment will be made in accordance with Subsection 104.02.

(2) Bedding Material: Measurement and payment will be made in accordance with Section 726. When the contract does not include a pay item for bedding material, payment will be made in accordance with Subsection 104.02.

(d) Payment for cleaning existing pipes will be made at the contract unit price per linear foot (lin m).

(e) Payment for concrete collars will be made at the contract unit price per each.

Payment will be made under:

Item No.	Pay Item	Pay Unit
701-01	Cross Drain Pipe (Size & Type)	Linear Foot (Lin m)
701-02	Cross Drain Pipe Arch (Size & Type)	Linear Foot (Lin m)
701-03	Storm Drain Pipe (Size & Type)	Linear Foot (Lin m)
701-04	Storm Drain Pipe Arch (Size & Type)	Linear Foot (Lin m)
701-05	Side Drain Pipe (Size)	Linear Foot (Lin m)
701-06	Side Drain Pipe Arch (Size)	Linear Foot (Lin m)
701-07	Yard Drain Pipe (Size)	Linear Foot (Lin m)
701-08	Relaying Pipe	Linear Foot (Lin m)
701-09	Fabricating Pipe Fittings	Each
701-10	Reinforced Concrete Pipe (Extension)	Linear Foot (Lin m)
701-11	Reinforced Concrete Pipe Arch (Extension)	Linear Foot (Lin m)
701-12	Corrugated Metal Pipe (Extension)	Linear Foot (Lin m)
701-13	Corrugated Metal Pipe Arch (Extension)	Linear Foot (Lin m)
701-14	Cleaning Existing Pipes	Linear Foot (Lin m)
701-15	Concrete Collar	Each
701-16	Plastic Pipe (Extension)	Linear Foot (Lin m)

SECTION 704 – GUARD RAIL:

Subsection 704.03 – General Construction Requirements (01/05), Pages 368 and 369.

Add the following to Heading (d), Guard Rail End Treatments.

All end treatments shall bear a label indicating the manufacturer and exact product name of the end treatment along with its assigned NCHRP 350 test level. This label shall resist weathering and shall be permanently affixed to the railing in such a way as to be readily visible.

SECTION 706 – CONCRETE WALKS, DRIVES AND INCIDENTAL PAVING:

All Subsections within Section 706 (04/08), Pages 375 – 377.

Delete Section 706, Concrete Walks, Drives and Incidental Paving and substitute the following.

SECTION 706
CONCRETE WALKS, DRIVES AND INCIDENTAL PAVING

706.01 DESCRIPTION. This work consists of furnishing and constructing portland cement concrete walks, handicapped curb ramps, drives and incidental paving slabs in accordance with

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these specifications and in conformity with lines, grades and dimensions shown on the plans or established.

706.02 MATERIALS. Materials shall comply with the following Section or Subsections.

Portland Cement Concrete (Class M)	901
Joint Filler	1005.01(c)
Reinforcing Steel	1009.01
Curing Materials	1011.01

706.03 CONSTRUCTION REQUIREMENTS.

(a) Excavation: Excavation shall be made to required depth and width. The top of the subgrade shall be shaped and compacted to a firm, even surface conforming to the section shown on the plans. Unsuitable material shall be removed and disposed of in accordance with Subsection 202.02 and replaced with approved material at no direct pay.

(b) Forms: Forms shall be of wood or metal and shall extend the full depth of concrete. Forms shall be straight, clean and of sufficient strength to resist the pressure of concrete. Bracing of forms shall be such that forms remain in horizontal and vertical alignment until their removal.

Concrete may be placed by slip-form methods. Slip-formed concrete shall be placed with an approved machine designed to spread, vibrate, consolidate and finish concrete in one pass of the machine in such manner that minimum hand finishing is necessary. Sliding forms shall be rigidly held together to prevent spreading of forms. After the passing of the side forms there shall be no noticeable slumping of concrete.

(c) Subgrade: The subgrade shall be thoroughly moistened immediately prior to placing concrete.

(d) Placing and Finishing: Concrete shall be placed on the subgrade, struck off to required thickness and tamped sufficiently to bring the mortar to the surface. The surface shall be finished with a wood float or steel trowel followed by brushing to a slightly rough finish. Joints and edges shall be rounded with an edging tool having a 1/4-inch (6 mm) radius.

(e) Joints:

(1) Expansion Joints: Expansion joints shall be filled with 1/2 inch (13 mm) thick preformed expansion joint filler. Expansion joints shall be installed at maximum 100-foot (30 m) intervals, and between intersecting paving and any fixed structure such as a building, bridge or curbing, and between intersecting paving and the handicapped curb ramps. Expansion joint material shall extend for the full width and depth of paving.

(2) Weakened Plane: Weakened planes shall be formed by a jointing tool or other acceptable means. Weakened planes shall extend into concrete for at least 1/4 of the depth and shall be approximately 1/8 inch (3 mm) wide.

a. Walks: Spacing of weakened planes for walks shall be equal to the width of walk.

b. Drives: A longitudinal weakened plane shall be formed along the centerline of drives more than 16 feet (5 m) wide, and transverse weakened planes shall be formed at not more than 16-foot (5 m) intervals.

c. Incidental Paving: Weakened planes for incidental paving shall be formed at intervals not exceeding 30 times the thickness of the concrete in length or width. Incidental paving poured adjacent to jointed concrete shall be jointed to match existing joints, with intermediate joints formed as necessary not to exceed the maximum joint spacing.

(3) Construction Joints: Construction joints shall be formed around manholes, utility poles, etc., extending into paving and 1/4 inch (6 mm) thick preformed expansion joint filler shall be installed in these joints.

(4) Tie-ins: Tie-ins of existing concrete shall be made by full depth sawing at no direct pay.

(f) Curing: Concrete shall be cured in accordance with Subsection 601.10.

(g) Detectable Warning Surface for Handicap Ramps and At-Grade Sidewalk Intersections: Sidewalks, when intersecting with roadways, shall be equipped with a detectable warning surface system consisting of raised truncated domes as a transition between the sidewalk and the street as required by the Americans with Disabilities Act, 28 CFR Part 36, ADA Standards for Accessible Design.

Detectable warnings (truncated domes) shall be installed on the ramp surface over the full width of the ramp throat for a distance of 24 inches (600 mm) in the direction of travel from the back of the curb. Detectable warnings (truncated domes) shall also be installed on at-grade sidewalks intersecting with roadways for a distance of 36 inches (900 mm) in the direction of travel from the end of the sidewalk. Truncated domes shall be laid out on a square grid in order to allow enough space for wheelchairs to roll between the domes.

Light reflectance of the truncated domes and the underlying surface must meet the 70 percent contrast requirement of ADAAG.

706.04 MEASUREMENT. Quantities of concrete walks, drives and incidental paving slabs for payment will be the design quantities as specified on the plans and adjustments thereto. Design quantities will be adjusted if the engineer makes changes to adjust to field conditions, if design errors are proven or if design changes are made. Design areas are based on the horizontal dimensions shown on the plans. Excavation, backfill, reinforcing steel and joint materials will not be measured for payment.

Handicapped curb ramps, including the detectable surface warning system, will be measured per each.

Detectable surface warning systems for at-grade sidewalk intersection will not be measured for payment.

706.05 PAYMENT. Payment for concrete walks, drives and incidental paving will be made on a lot basis at the contract unit price per square yard (sq m), adjusted in accordance with the following provisions. Payment for each lot will be made in accordance with Table 901-6. Size, sampling, and testing of each concrete lot shall be in accordance with the Materials Sampling Manual.

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Payment for handicapped curb ramps, including the detectable surface warning system, will be made by each and shall include, but not limited to, curb transitions, detectable warning system, gutter, landing and base.

Payment will be made under:

Item No.	Pay Item	Pay Unit
706-01	Concrete Walk (inch (mm) Thick)	Square Yard (Sq m)
706-02	Concrete Drive (inch (mm) Thick)	Square Yard (Sq m)
706-03	Incidental Concrete Paving (inch (mm) Thick)	Square Yard (Sq m)
706-04	Handicapped Curb Ramps	Each

SECTION 713 – TEMPORARY TRAFFIC CONTROL:

Subsection 713.06 – Pavement Markings (08/06), Pages 400 – 403.

Delete Table 713-1, Temporary Pavement Markings and substitute the following.

Table 713-1
Temporary Pavement Markings^{1,2}

		Two-lane Highways	Undivided Multilane Highways	Divided Multilane Highways
SHORT TERM	ADT<1500; or ADT>1500 and time<3 days	Lane lines 4-foot (1.2 m) tape on 40-foot (12 m) centers; with "Do Not Pass" and "Pass With Care" signs as required		
	ADT>1500; Time>3 days and<2 weeks	Lane lines 4-foot (1.2-m) tape on 40-foot (12-m) centers with no passing zone markings		
	All ADT's with time <2 weeks		Lane lines 4-foot (1.2m) tape on 40-foot (12 m) centers; double yellow centerline	Lane lines 4-foot (1.2 m) tape on 40-foot (12 m) centers
LONG TERM	All ADT's with time >2 weeks	Standard lane lines, no-passing zone markings, legends and symbols and when pavement width is 22 feet (6.7 m) or greater, edge lines	Standard lane lines, centerlines, edge lines, and legends and symbols	Standard lane lines, centerlines, edge lines, and legends and symbols.

¹No-passing zones shall be delineated as indicated whenever a project is open to traffic.

²On all Asphaltic Surface Treatments that are open to traffic and used as a final wearing course or as an interlayer, temporary pavement markings (tabs) on 20-foot (6 m) centers shall be used, in lieu of the 4-foot (1.2 m) tape, on 40-foot (12 m) centers.

SECTION 719 – LANDSCAPING:

Subsection 719.06 – Construction Methods (03/09), Pages 429 – 432.

Delete the first paragraph of Heading (a), Seasonal Operations and substitute the following.

Unless otherwise directed by the engineer in writing, the planting season is between November 1 and April 15.

SECTION 729 – TRAFFIC SIGNS AND DEVICES:

Subsection 729.02 – Materials (04/08), Pages 456 and 457.

Delete the contents of Heading (a), Sign and Marker Sheeting, and substitute the following.

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(a) Sign and Marker Sheeting: Sheeting material for sign panels, delineators, barricades and other markers shall comply with Section 1015. All permanent signs shall meet the requirements of ASTM D 4956, Type X.

Subsection 729.04, Fabrication of Sign Panels and Markers (04/08), Pages 458 – 460.

Delete the third paragraph of Heading (c), Sheeting Application and substitute the following.

ASTM D 4956 Type X reflective sheeting shall be applied with an orientation determined by the engineer to obtain the optimum entrance angle performance. Fabricated vertical splices in ASTM D 4956 Type X reflective sheeting will be allowed only when the horizontal dimension of the sign face or attached shield is in excess of the maximum manufactured width of the sheeting. Fabricated vertical splices in ASTM D 4956 Type X reflective sheeting will also be allowed when the specified orientation will create excessive sheeting waste.

SECTION 730 – ELECTRICAL SYSTEMS:

Subsection 730.04 – Drawings and Equipment Submittals (03/09), Pages 468 and 469.

Delete the third sentence of Heading (b), As-Built Drawings and substitute the following:

The drawings shall show the exact location of the underground wiring, light poles, junction boxes, under roadway crossings, service poles, controllers, disconnects, and conduit or cables.

Subsection 730.08 – Measurement (03/09), Pages 470 – 472.

Delete Heading (e), Jacked or Bored Casing and substitute the following:

(e) Jacked or Bored Casing: Jacked or bored casings will be measured by the linear foot (lin m) of casing furnished and installed, which will include the casing, fittings, and required excavation and backfill.

Add the following:

(t) Modular Breakaway Cable System: Modular breakaway electrical cable systems for low mast light poles shall be measured per each and shall include all materials, labor, equipment, and tools necessary to furnish and install a complete system in accordance with the plans and specifications.

(u) Disconnect: Disconnects shall be measured per each and shall include all materials, labor, equipment, and tools necessary to furnish and install this item in accordance with the plans and specifications.

(v) Duct Markers: Duct markers shall be measured per each and shall include all materials, labor, equipment, and tools necessary to furnish and install this item in accordance with the plans and specifications.

(w) Underground Marker Tape: Marker tape shall be measured per linear foot and shall include all materials, labor, equipment, tools necessary to furnish and install this item in accordance with the plans and specifications.

Subsection 730.09, Payment (03/09), Pages 472 and 473.

Add the following pay items.

<u>Item No.</u>	<u>Pay Item</u>	<u>Pay Unit</u>
730-19	Modular Breakaway Cable System	Each
730-20	Disconnect (Type)	Each
730-21	Duct Marker (Type)	Each
730-22	Underground Marker Tape (Size and Type)	Linear Foot (Lin m)

SECTION 732 – PLASTIC PAVEMENT MARKINGS:

All subsections within Section 732 (10/11), Pages 477 – 482.

Delete Section 732, Plastic Pavement Markings and substitute the following:

Section 732
Plastic Pavement Markings

732.01 DESCRIPTION. This work consists of furnishing and placing reflective pavement markings of hot applied thermoplastic or preformed (cold or hot applied) plastic at the locations shown on the plans or as directed. This work shall be in compliance with the MUTCD, plan details and these specifications. Plastic pavement markings include stripes, gore markings, lines, legends and symbols.

732.02 MATERIALS.

(a) Thermoplastic Markings: Thermoplastic marking material shall be a plastic compound reflectorized by internal and external application of glass beads, complying with Subsections 1015.10 and 1015.13. Black thermoplastic marking material shall be used according the standard plans on all portland cement concrete pavement. This material shall not require glass beads. Width and color of markings shall be as specified.

Thermoplastic material shall be delivered in containers of sufficient strength to permit normal handling during shipment and transportation without loss of material. Approved heat-degradable containers that can be placed in heating kettles along with the plastic material will be permitted. Each container shall be clearly marked to indicate color of material, process batch number, name of manufacturer and date of manufacture.

The material, upon heating to application temperature, shall not give off fumes that are toxic to persons or property. The maximum elapsed time after application which normal traffic will leave no impression or imprint on the new strip shall be 60 seconds when the air and road surface temperature is approximately 68°F ± 5°F (20°C ± 3°C). The material shall provide a stripe that has a uniform thickness throughout its cross-section.

(b) Preformed Plastic Markings: Preformed plastic markings shall comply with Subsection 1015.11.

(c) Surface Primer: A single component surface primer or two component epoxy primer sealer shall be provided by the contractor for the appropriate application in accordance with Subsection 732.03(e). The primer shall form a continuous film that dries rapidly and adheres to

the pavement. The primer material shall not discolor or cause any noticeable change in the appearance of the pavement outside of the finished pavement marking. A sample of the primer shall be submitted with the recommended method of application to the engineer and to the manufacturer of the thermoplastic marking material. Written approval shall be obtained from the engineer and the manufacturer before applying the primer.

(d) Glass Beads: Glass beads used for drop-on application to molten plastic shall be shipped in moisture resistant sacks (containers). The sacks shall be strong enough to permit handling without damage. Sacks shall be sufficiently water-resistant so that beads will not become wet or caked in transit.

Glass beads for standard (flat) thermoplastic markings shall be in accordance with Subsection 1015.13.

732.03 CONSTRUCTION REQUIREMENTS FOR PLASTIC PAVEMENT MARKING MATERIAL.

(a) Equipment for Standard (Flat) Thermoplastic Marking Material:

The application equipment shall consist of an extrusion die or a ribbon gun that simultaneously deposits and shapes lines at a thickness of 90 mils (2.3 mm) or greater on the pavement surface. When restriping onto existing thermoplastic markings, only a ribbon gun shall be used. Finished markings shall be continuous and uniform in shape, and have clear and sharp dimensions. Applicators shall be capable of producing various widths of traffic markings. Applicators shall produce sharply defined lines and provide means for cleanly cutting off stripe ends and applying broken lines. The ribbon extrusion die or shaping die shall not be more than 2 inches (50 mm) above the roadway surface during application. A spray application will only be allowed when applying 40 mil (1.0 mm) thermoplastic.

The application equipment shall provide continuous mixing and agitation of material. Thermoplastic conveying equipment components located between the main material reservoir and discharge mechanism shall be free from material accumulation and clogging. Parts of application equipment in contact with the material shall be easily accessible for cleaning and maintaining. Mixing and conveying equipment shall maintain material at the application temperature.

Glass beads shall be applied to the molten surface of completed stripes by either a single drop or a double drop application depending on the thickness of the thermoplastic striping as shown in Table 1015-13. Glass beads for single drop applications and the first (large) bead drop for double drop applications shall be applied by a gravity bead dispenser attached to the striping machine in such a manner that beads are dispensed simultaneously with the thermoplastic material at a controlled rate of flow on installed lines. The second (small) bead drop shall be applied immediately after the first bead drop by a gravity bead dispenser attached to the striping machine.

Applicators and kettles shall be equipped and arranged to comply with requirements of the National Board of Fire Underwriters. Applicators shall be maneuverable to the extent that straight lines can be followed and normal curves can be made in a true arc. Applicator equipment shall consist of a motorized mobile unit capable of installing traffic stripes either left or right of the applying unit so that only one lane of traffic will be occupied during installation.

(b) Weather Limitations: Application of markings will not be permitted when there is excessive pavement moisture. The pavement shall be considered excessively moist when it is visibly wet or when a 1 square foot (0.1 sq m) piece of polyethylene film condenses moisture after being placed on the pavement surface for 15 minutes. The surface temperature and the ambient temperature must be 50°F (10°C) and rising to begin striping operations. Striping operations shall cease when either temperature reaches 50°F (10°C).

(c) Cleaning of Surfaces: Surfaces on which markings are to be applied shall be cleaned of materials that may reduce adhesion of the thermoplastic marking materials to the pavement. Cleaning shall be done by blast cleaning or grinding. Surfaces shall be kept clean until placement of markings.

(d) Removal of Existing Markings:

(1) 40 Mil (1.0mm): Existing thermoplastic markings that are not flaking or peeling will not require removal prior to placement of thermoplastic. Flaking or peeling material shall be removed by mechanical sweeper or wire brush to the satisfaction of the engineer prior to thermoplastic application.

(2) 90 Mil (2.3mm): Existing thermoplastic markings and painted markings, regardless of condition, shall be removed prior to placement of 90 mil (2.3 mm) thick or greater thermoplastic except on asphalt pavements, unless otherwise directed.

(3) Intersection Markings, Legends and Symbols: Existing markings shall be removed from the pavement surface so that 125 mils of new markings can be applied.

(4) Preformed Plastic Markings (Tape): Existing markings shall be removed from the pavement surface before applying the preformed plastic markings (tape).

Removal of markings shall be accomplished by methods that will not damage the pavement or bridge deck. After the markings are removed, the debris and residue shall be picked up and disposed of by the contractor so that the primer and thermoplastic can adhere to the pavement. At the end of each day's operations the engineer may direct that temporary pavement markings complying with Section 713 be used in areas where existing markings have been removed and new markings not placed. Temporary pavement markings shall be satisfactorily removed prior to resuming thermoplastic marking operations.

All markings made in error or not conforming to the traffic operation in use shall be removed by either an abrasion or burning process to the satisfaction of the engineer. Markings shall not be obliterated by painting with asphalt binder or other material.

(e) Application of Surface Primer: A single component surface primer will be required prior to placement of thermoplastic markings over oxidized asphalt, when striping over existing thermoplastic on portland cement concrete surfaces, or when 40 mil (1.0 mm) thick thermoplastic is allowed to be placed over existing markings on concrete surfaces, unless otherwise directed by the engineer. A two component epoxy primer sealer will be required prior to placement of thermoplastic materials on portland cement concrete surfaces, unless otherwise directed by the engineer.

(f) Application of Markings: Material shall be installed in specified widths from 4 inches to 8 inches (100 mm to 200 mm) for 40 mil (1.0 mm) applications and from 4 inches to 24 inches (100 mm to 600 mm) for 90 mil (2.3 mm) applications. Finished lines shall have well defined edges and be free of waviness. Measurements shall be taken as an average through any 36-inch

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(900 mm) section of line. Longitudinal lines shall be offset approximately 2 inches (50 mm) from longitudinal joints. A tolerance of +1/2 inch and -1/8 inch (+13 mm and -3 mm) from the specified width will be allowed, provided the variation is gradual. Segments shall square off at each end without mist or drip. Transverse variations from the control device up to 1 inch (25 mm) will be allowed provided the variation does not increase or decrease at the rate of more than 1/2 inch in 25 feet (15 mm in 10.0 m). Lines not meeting these tolerances shall be removed and replaced at no direct pay.

(1) Thermoplastic Markings: For extruded or ribbon gun applied markings, the thickness of material, not including drop-on beads, shall be not less than 90 mils (2.3 mm) for lane lines, edge lines, black contrast, and gore markings and not less than 125 mils (3.2 mm) for crosswalks, stop lines, and word and symbol markings.

For spray applications the thickness of material, not including drop-on beads, shall not be less than 40 mils (1.0 mm).

Thermoplastic material at 90 mil (2.3 mm) thickness or greater shall be applied by extrusion at 390°F to 450°F (200°C to 230°C), unless otherwise recommended by the manufacturer. Thermoplastic material at 40 mil (1.0 mm) thickness shall be applied by spray at 410°F to 450°F (210°C to 230°C). Immediately after application of the markings, glass beads for a single drop application shall be applied at a minimum rate of 141 pounds per mile (40 kg/km) for a 4-inch (100 mm) solid line stripe. Glass beads for a double drop application shall be applied at a minimum rate of 211 pounds per mile (60 kg/km) for each drop on a 4-inch (100 mm) solid line. Black thermoplastic pavement marking material shall not require glass beads. Material shall not scorch or discolor when kept at this temperature range for 4 hours.

(2) Preformed Plastic Markings: Plastic tape shall be applied with adequate pressure to ensure proper adhesion. Preformed heat-applied thermoplastic material shall be applied in accordance with the manufacturers' recommendation. Material not adhering properly shall be satisfactorily corrected at no direct pay.

(g) Field Testing of Roadway Markings: The contractor will field test the pavement markings in accordance with Subsections 1015.10 and 1015.11 and Table 732-1. Failure to meet these requirements will require the contractor to replace the portion of the material shown to be out of specifications as directed.

(h) Initial Requirements Corrective Work: Any line found to be defective shall be restriped as directed by the engineer. The corrective work shall also be subject to these requirements and as noted in Table 732-2, "Payment Adjustments for Initial Retroreflectivity." The contractor shall provide the materials and install the pavement marking at no direct pay.

(i) Subsequent (Warranty) Requirements Corrective Work: The Department will take subsequent readings not later than one year after installation. The retroreflective requirements for warranty readings are in accordance with Subsection 1015.10(c)(3), "Retroreflectivity". If a project fails to meet retroreflective requirements the contractor shall, at no cost to the Department, replace the materials and install the pavement markings. The Department will determine if the failure is due to poor workmanship or due to no fault of the contractor. Disputes will be resolved by the Chief Engineer.

(j) Guarantee: Work performed in accordance with this Section shall be guaranteed as specified in Subsection 104.05, "Guarantees".

732.04 MEASUREMENT.

(a) Plastic Pavement Striping: Plastic striping will be measured by the linear foot (lin m) or mile (km), as specified. When a bid item is not included for gore markings, the Department will measure the quantity by converting the actual length and width of line installed to an equivalent length of the normal width line on that section of roadway.

(1) Linear Foot (Lin m): Measurement will be made by the linear foot (lin m) of striping, exclusive of gaps.

(2) Mile (km): Measurement will be made by the mile (km) of single stripe. No deduction will be made for standard 30-foot (9 m) design gaps in broken-line striping; however, deductions will be made for the length of other gaps or omitted sections.

(b) Plastic Pavement Legends and Symbols: Plastic legends and symbols will be measured per each legend or symbol. Symbols shall include all letters, lines, bars or markings necessary to convey the message at each location.

(c) Removal of Existing Markings: Removal of existing pavement markings for undivided highways will be measured by the linear mile (km) of full roadway width including shoulders. For divided highways, the full roadway width including shoulders and ramps will be measured separately for each direction of travel. Removal of pavement markings will include removal of lane lines, edgelines, gore markings, legends, symbols, and raised pavement markers.

732.05 PAYMENT. Payment for the completed and accepted quantities of plastic pavement markings and removal of existing markings will be made at the contract unit prices, or in accordance with Table 732-2, "Payment Adjustments for Initial Retroreflectivity."

Payment will be made under:

<u>Item No.</u>	<u>Pay Item</u>	<u>Pay Unit</u>
732-01	Plastic Pavement Striping (inch (__mm) Width)	Linear Foot (Lin m)
732-02	Plastic Pavement Striping (Solid Line) (inch (__mm) Width)	Mile (km)
732-03	Plastic Pavement Striping (Broken Line) (inch (__mm) Width)	Mile (km)
732-04	Plastic Pavement Legends and Symbols (Type)	Each
732-05	Removal of Existing Markings	Mile (km)

Table 732-1
Field Testing of Plastic Pavement Markings

Length of Roadway	Minimum Required Readings
Less than 1 mile (1.6 km)	10 evenly spaced readings per line type/color ¹
1 mile (1.6 km) to 6 miles (9.6 km)	10 evenly spaced readings per line type/color for each 1 mile (1.6 km) section ¹
Greater than 6 miles (9.6 km)	5 evenly spaced readings per line type/color for each 1 mile (1.6 km) section ²
Legends and Symbols	Visual night time inspection only
8", 16" and 24" Lines	5 readings per line/color ²
¹ Average of 10 readings per set ² Average of 5 readings per set	
Measurements 1. Each line type/color will be measured separately. 2. Measurements will be taken on dry, clean roadways. 3. Data will be collected in direction of traffic flow. 4. On broken lines (skip striping), no more than two readings will be taken per stripe, with readings 20 inches (0.5 m) from ends of marking. 5. The Department may take additional readings. 6. Acceptance will be based on the average of each set of readings for each line type/color. 7. Failure of the average reading for any segment to meet the specified minimum values will require replacement, corrective action or subject to payment adjustments specified in Table 732-2, "Payment Adjustment for Initial Retroreflectivity". 8. Limits of replacement will be determined by the engineer. 9. Line widths 8"; 16"; and 24" will be tested per each location or as directed by the engineer. Retroreflectivity shall match 40 mil (1.0 mm) requirements. 10. Aggregate Surface Course projects will not be tested for retroreflectivity, but will be visual inspected at night for acceptance by the engineer. 11. Multiple lane roadways will require testing of each lane line per mile. 12. No reflectance readings are required for black thermoplastic pavement markings.	

Table 732-2
 Payment Adjustment for Initial Retroreflectivity

Contract Unit Price ¹ , %	White (mcd\lux\m ²)		Yellow (mcd\lux\m ²)	
	40 mil (1.0 mm)	90 mil (2.3 mm)	40 mil (1.0 mm)	90 mil (2.3 mm)
103 ²	350	450	225	300
100	250	375	175	250
90	230	360	165	230
80	220	340	155	220
50 or Restripe	200	325	150	200

¹The payment requirements are based on the project total average of all test segments for initial reading in accordance with Table 732-1.

²There cannot be any test segments meeting less than 100 percent pay within the project limits to qualify for the bonus payment.

All subsections within Section 737 (09/11), Pages 503 – 507.

Delete Section 737, Painted Traffic Striping and substitute the following:

Section 737
Painted Traffic Striping

737.01 DESCRIPTION. This work consists of furnishing and applying reflective white or yellow paint for pavement striping, curbs and traffic islands in accordance with plan details, the MUTCD and these specifications.

737.02 MATERIALS. Traffic paint shall be a water-based traffic paint complying with Subsection 1015.12. Glass beads for drop-on application shall comply with Subsection 1015.13.

737.03 EQUIPMENT. Selection of proper equipment to produce satisfactory results within the following requirements shall be the responsibility of the contractor.

(a) Equipment shall permit traffic to pass safely within the limits of the roadway surface and shoulder while operating.

(b) Equipment shall be designed for placement of both solid and broken line stripes of the spacing shown on the plans with square, neat stripe ends. Hand spraying may be used for curbs and traffic islands.

(c) Equipment shall provide a method for cleaning the surface of dust immediately prior to placement of any striping or painting materials.

(d) Equipment shall provide a gravity bead dispenser for drop-on application of glass beads.

(e) The equipment shall provide accurate regulation of the application rate and shall have a tachometer or other approved device to ensure uniform paint application at the designated rate. The equipment shall be adjustable for applying one, two or three adjacent lines simultaneously at the specified spacing and be equipped with a device capable of following a control line. Operation of the unit shall be such that paint will not be spattered or blown on another stripe or outside the prescribed limits during application. The unit shall be designed to properly agitate the paint while in operation.

(f) The equipment may be equipped with a heat exchanger to heat the paint to reduce drying time.

(g) The operation shall include a trailing vehicle equipped with a flashing arrow board.

737.04 CONSTRUCTION. Yellow centerline striping shall be used to delineate traffic moving in opposite directions. White lane line striping shall be used to delineate traffic moving in the same direction. These stripings shall be broken lines and solid lines as required by Part 3 of the MUTCD. Edge lines shall be solid lines, the color of which shall be determined from Part 3 of the MUTCD.

Pavement striping shall be 4 inches (100 mm) in width on all routes. Striping widths for gore markings and turning lanes shall be 8 inches (200 mm) unless noted otherwise in the plans. All lines shall have clean edges with a width tolerance in accordance with Subsection 737.08. The engineer may waive the tolerance when deviations are caused by undulation in the pavement surface.

Broken lines shall be constructed with a stripe-to-gap ratio of a 10-foot (3 m) paint stripe to a 30-foot (9m) gap. The length of the stripe shall be 10 feet (3 m) minimum and 10 1/2 feet (3.2 m) maximum. The stripe-gap cycle shall be 40 feet (12 m) minimum and 40 1/2 feet (12.3 m) maximum.

Curbs and islands shall be painted (yellow or white) as determined in the plans. Paint for curbs and islands may be applied by machine or hand methods as approved by the engineer.

The contractor shall apply all paint on new pavement prior to opening to traffic. When rain or other unavoidable occurrences prevent the marking of pavement, the contractor shall mark the pavement as soon as conditions permit before the roadway is allowed to be open. The requirements of Subsection 713.06 shall govern over the above mentioned application requirements.

737.05 SURFACE PREPARATION. Surfaces to be painted shall be cleaned of materials that may reduce adhesion of paint. Any flaking or peeling material shall be removed by mechanical sweeper or wire brush to the satisfaction of the engineer. Surfaces shall be kept clean and dry at the time of application of paint.

737.06 WEATHER LIMITATIONS. No painting shall be done when:

1. the pavement surface is not thoroughly dried; or,
2. the air is foggy or misty; or,
3. the air or surface temperature is below 50°F (10°C); or,
4. wind or other conditions cause a film of dust to be deposited on the surface after cleaning;
or,
5. wind causes displacement of striping material.

737.07 APPLICATION. The longitudinal joint or existing centerline stripe shall be used in determining the location of the centerline of new striping. In the absence of a longitudinal joint or existing stripe, the location of the centerline of new striping shall be located by the contractor with the approval of the engineer. Broken line individual intervals will not be marked. No striping material shall be applied over a guide stringline.

(a) Paint Preparation: Immediately before application, paints shall be agitated and mixed thoroughly to a uniform consistency, free from lumps or agglomerates. Paints shall be kept covered to retain volatiles. Paints shall not be thinned without approval. Paint shall be kept thoroughly mixed throughout the application process.

Paint may be heated in heat exchangers to accelerate drying, to a temperature between 110°F and 130°F (43°C and 54°C) for water-based paint.

(b) Application Rate: Paint shall be applied at the rate of 25 gallons per mile (59 L/km) at a thickness of 22 wet mils (560 wet μm) and 15 dry mils (380 dry μm) to produce a 4-inch (100 mm) wide solid line. Temporary paint shall be applied at a thickness of 15 wet mils (380 wet μm). Curb and island painting shall be applied at the rate of 12.5 gallons per 100 square yards (57 liters /100 sq m) at a thickness of 15 wet mils (380 wet μm).

Glass beads, complying with Subsection 1015.13, shall be applied at the same time as the paint but in a separate operation at the rate of 90 pounds of beads per 100 square

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yards (49 kg/ 100 sq m). The application of glass beads by the drop-on-method for hand painting shall be at the rate of 72 pounds per 100 square yards (39 kg/100 sq m) of markings or as specified in the plans.

737.08 TOLERANCES. A tolerance of +1/2 inch and -1/8 inch (+13 mm and -3 mm) from the specified width will be allowed, provided the variation is gradual. Segments of broken line may vary ± 6 inches (150 mm) from the specified length provided it is not consistently short. Segments shall be squared off at each end without mist or drip. Longitudinal painted lines shall not deviate from established alignment by more than 1 inch (25 mm) provided the variation does not increase or decrease at the rate of more than 1/2 inch in 25 feet (15 mm in 10 m). Lines not meeting these tolerances shall be removed by abrasive blasting or grinding and replaced at no direct pay.

737.09 PROTECTION OF MARKINGS. Traffic shall be prevented from crossing a wet stripe. The contractor shall use flaggers or other methods to prevent traffic from crossing the wet paint or adjust the operation. Paint that has been marred or picked up by traffic before it has dried shall be repaired by the contractor at no direct pay. The pavement shall be cleaned outside the painted area at no direct pay.

The contractor is not required to maintain striping which has been accepted and opened to traffic.

737.10 PROTECTION OF TRAFFIC. The contractor shall furnish and place all necessary temporary warning and directional signs to direct and protect the traveling public during striping or painting operations.

The pavement striping equipment shall move in the direction of normal traffic flow. The trailing vehicle shall be equipped with an approved flashing arrowboard for directing traffic to the appropriate side during striping operation, when required. Temporary signs, cones and equipment shall be removed from the roadway when striping equipment is not in operation.

Protective and traffic marking devices shall comply with Section 713.

The contractor shall be responsible for resolving all issues related to paint on private vehicles at no direct pay.

737.11 FIELD TESTING OF PAINTED TRAFFIC STRIPING: The Department will field test the pavement markings in accordance with Subsection 1015.12 and Table 737-1. Failure to meet these requirements will require the contractor to provide material and install the portion of the material shown to be out of specifications as directed by the engineer at no cost to the Department.

737.12 CORRECTIVE WORK: Any line or painted area found to be defective shall be restriped or repainted as directed by the engineer. The corrective work shall also be subject to these requirements and as noted in Table 737-2, "Payment Adjustments for Initial Retroreflectivity". The contractor shall restripe or repaint any defective area at no cost to the Department.

737.13 GUARANTEE: All work performed in accordance with this section shall be guaranteed in accordance with Subsection 104.05.

737.14 MEASUREMENT. Painted Traffic Striping will be measured by the mile (km) or linear foot (lin m) as specified. Painted curbs and islands will be measured by the square yard or linear foot. The quantities of traffic paint for payment will be the design quantities specified in the plans and adjustments thereto. The design quantities will be adjusted if the engineer makes changes to adjust to field conditions, if design errors are proven, or if design changes are necessary.

(a) Mile (km): Measurement will be by the mile (km) of single stripe per roadway. No deduction will be made for the standard 30-foot (9 m) design gaps in broken-line striping; however, deductions will be made for the length of other omitted sections.

(b) Linear Foot (Lin m): Measurement will be by the linear foot (lin m), exclusive of gaps.

(c) Square Yard (sq m): Measurement will be by the square yard (sq m) based on horizontal dimensions of the painted area. Quantities will not be adjusted for the vertical faces.

737.15 PAYMENT. Payment for painted traffic striping paint will be made at the contract unit prices and as noted in Table 737-2, "Payment Adjustments for Initial Retroreflectivity".

Payment will be made under:

<u>Item No.</u>	<u>Pay Item</u>	<u>Pay Unit</u>
737-01	Painted Traffic Striping (Solid Line)	Mile (km)
737-02	Painted Traffic Striping (Broken Line)	Mile (km)
737-03	Painted Traffic Striping (Solid Line)	Linear Foot (Lin m)
737-04	Painted Curbs and Islands	Square Yard (Sq m)
737-05	Painted Curbs and Islands	Linear Foot (Lin m)

Table 737-1
Field Testing of Painted Pavement Markings

Length of Roadway	Minimum Required Readings
Less than 1 mile (1.6 km)	10 evenly spaced readings per line type/color ¹
1 mile (1.6 km) to 6 miles (9.6 km)	10 evenly spaced readings per line type/color for each 1 mile (1.6 km) section ¹
Greater than 6 miles (9.6 km)	5 evenly spaced readings per line type/color for each 1 mile (1.6 km) section ²
Legends and Symbols	Visual night time inspection only
8", 16" and 24" Lines	5 readings per line/color ²
¹ Average of 10 readings per set ² Average of 5 readings per set	
Measurements 1. Each line type/color will be measured separately. 2. Measurements will be taken on dry, clean roadways. 3. Data will be collected in direction of traffic flow. 4. On broken lines (skip striping), no more than two readings will be taken per stripe, with readings 20 inches (0.5 m) from ends of marking. 5. The Department may take additional readings. 6. Acceptance will be based on the average of each set of readings for each line type/color. 7. Failure of the average reading for any segment to meet the specified minimum values will require replacement, corrective action, or subject to payment adjustments specified in Table 732-2, "Payment Adjustment for Initial Retroreflectivity". 8. Limits of replacement will be determined by the engineer. 9. Line widths 8"; 16"; and 24" will be tested per each location or as directed by the engineer. Retroreflectivity shall match 40 mil (1.0 mm) requirements. 10. Aggregate Surface Course projects will not be tested for retroreflectivity, but will be visual inspected at night for acceptance by the engineer. 11. Multiple lane roadways will require testing of each lane line per mile.	

Table 737-2
 Payment Adjustment for Initial Retroreflectivity

Contract Unit Price ¹ , %	Retroreflectivity Number (Painted Markings)	
	White (mcd\lux\m ²)	Yellow (mcd\lux\m ²)
100	250	175
90	230	165
80	220	155
50 or Restripe	200	150

¹ The payment requirements are based on the project total average of all test segments for initial reading in accordance with Table 737-1.

SECTION 804 – DRIVEN PILES:

Subsection 804.08 – Construction Requirements (04/07), Pages 548 – 554.

Delete the first sentence of Heading (a), Preboring and substitute the following.

Preboring by augering, wet-rotary drilling, or other methods used to facilitate pile driving will not be permitted unless specified in the plans or allowed by the engineer.

Delete the first sentence of Heading (b), Jetting and substitute the following.

Jetting will not be permitted unless allowed in the plans or allowed by the engineer.

SECTION 813 – CONCRETE APPROACH SLABS:

Subsection 813.03 – Embankment (06/08), Pages 688 – 690.

Delete the third paragraph and substitute the following:

When specified, the approach slab shall be placed on a layer of bedding material in accordance with plan details. Bedding material shall be placed and compacted as directed and covered with approved polyethylene film of at least 6-mil (150 µm) nominal thickness.

SECTION 901 – PORTLAND CEMENT CONCRETE:

Subsection 901.06 – Quality Control of Concrete (08/06), Pages 726 – 731.

Add the following to the contents of Heading (b), Quality Control Tests.

The contractor shall be responsible for monitoring the components (cement, mineral and chemical admixtures, aggregates) in their mix to protect against any changes due to component variations. As component shipments arrive, the contractor shall verify slump, air content and set time by testing at ambient temperatures. The contractor shall make adjustments to the mix design to rectify any changes which would adversely affect constructability, concrete placement or the specifications. The contractor shall submit test results to the Department for review each day of paving. Testing to validate component consistency will be documented on the control logs. Conformance or variation in mix parameters (workability, set times, air content, etc.) shall

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be noted on the control logs. The contractor shall provide a copy of the proposed testing plan to the engineer for record. Acceptance of the plan does not relieve the contractor's responsibility for consistency.

Subsection 901.08 – Composition of Concrete (12/05), Pages 732 – 734.

Add the following to Heading (a).

The blended cement containing up to 50 percent of grade 100 or grade 120 ground granulated blast-furnace slag must be in compliance with Subsection 1001.04 for portland blast-furnace slag cement.

SECTION 1001 – HYDRAULIC CEMENT:

Subsection 1001.01 – Portland Cement (09/07). Page 749.

Delete the contents of this subsection and substitute the following.

1001.01 PORTLAND CEMENT. Portland cement shall be from an approved source listed in QPL 7 and shall comply with AASHTO M 85.

Alkali content calculated as sodium oxide equivalent shall not exceed 0.60 percent by weight for all types of cement.

SECTION 1002 – ASPHALT MATERIALS AND ADDITIVES:

Subsection 1002.02 – Asphalt Material Additives (04/08), Pages 750 – 760.

Delete Table 1002-1, Performance Graded Asphalt Cements and substitute the following.

**Table 1002-1
Performance Graded Asphalt Cements**

Property	AASHTO Test Method	PG82-22rm ⁶	PG76-22m	PG70-22m	PG64-22	PG58-28
		Spec.	Spec.	Spec.	Spec.	Spec.
Tests on Original Binder:						
Rotational Viscosity @ 135°C, Pa·s ¹	T 316	3.0	3.0	3.0	3.0	3.0
Dynamic Shear, 10 rad/s, G*/Sin Delta, kPa	T 315	1.00+ @ 82°C	1.00+ @ 76°C	1.00+ @ 70°C	1.30+ @ 64°C	1.00+ @ 58°C
Flash Point, °C	T 48	232+	232+	232+	232+	232+
Solubility, % ²	T 44	N/A	99.0+	99.0+	99.0+	99.0+
Separation of Polymer, 163°C, 48 hours, degree C difference in R & B from top to bottom ⁵	ASTM D 7173 AASHTO T 53	---	2-	2-	---	---
Force Ductility Ratio (f ₂ /f ₁ , 4°C, 5 cm/min., f ₂ @ 30 cm elongation) ³	T 300	---	0.30+	---	---	---
Force Ductility, (4°C, 5 cm/min, 30 cm elongation, kg) ³	T 300	---	---	0.23+	---	---
Tests on Rolling Thin Film Oven Residue:						
Mass loss, %	T 240	1.00-	1.00-	1.00-	1.00-	1.00-
Dynamic Shear, 10 rad/s, G*/Sin Delta, kPa	T 315	2.20+ @ 82°C	2.20+ @ 76°C	2.20+ @ 70°C	2.20+ @ 64°C	2.20+ @ 58°C
Elastic Recovery, 25°C, 10 cm elongation, % ⁴	T 301	60+	60+	40+	---	---
Ductility, 25°C, 5 cm/min, cm	T 51	---	---	---	90+	---
Tests on Pressure Aging Vessel Residue:						
Dynamic Shear, @ 25°C, 10 rad/s, G* Sin Delta, kPa	T 315	5000-	5000-	5000-	5000-	5000- @ 19°C
Bending Beam Creep Stiffness, S, MPa @ -12°C.	T 313	300-	300-	300-	300-	300- @ -18°C
Bending Beam Creep Slope, m value, @ -12°C	T 313	0.300+	0.300+	0.300+	0.300+	0.300+ @ -18°C

¹The rotational viscosity will be measured to determine product uniformity. The rotational viscosity measured by the supplier shall be noted on the Certificate of Delivery. A binder having a rotational viscosity of 3.0 Pa·s or less will typically have adequate mixing and pumping capabilities. Binders with rotational viscosity values higher than 3.0 Pa·s should be used with caution and only after consulting with the supplier as to any special handling procedures and guarantees of mixing and pumping capabilities.

²Not all polymers are soluble in the specified solvents. If the polymer modified asphalt digested in the solvent will not pass the filter media, a sample of the base asphalt used in making the polymer modified asphalt should be tested for solubility. If the solubility of the base asphalt is at least 99.0%, the material will be considered as passing.

³AASHTO T 300 except the second peak (f₂) is defined as the stress at 30 cm elongation.

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⁴AASHTO T 301 except elongation shall be 10 cm.

⁵Prepare samples per ASTM D 7173. Determine softening point of top and bottom per AASHTO T 53.

⁶The quality assurance plan for this product will require the contractors who use this material to submit written documentation of tank cleaning annually. Contractors must have tank mixers. Written certificates of analysis from the asphalt binder supplier confirming rubber source and size distribution of rubber used shall be furnished to the Materials Laboratory.

Add the following Table 1002-12, Anionic Trackless Tack Coat Grade NTSS-1HM.

Table 1002-12
 Anionic Trackless Tack Coat Grade NTSS-1HM

Property	AASHTO Test Method	Specification Deviation	
		100% Pay	50% Pay or Remove ¹
Viscosity, Saybolt Furol @ 25°C, s	T 59	15 - 100	---
Storage Stability, 24 Hour, %	T 59	1.0-	---
Settlement, 5 Days, %	T 59	5.0-	---
Residue by Distillation, %	T 59	50+	49-
Oil Distillate, %	T 59	1.0-	---
Sieve Test ² , (Retained on the 850 µm), %	T 59	0.3-	---
Tests on Residue			
Penetration @ 25°C, 100g, 5s, dmm	T 49	20-	---
Softening Point, Ring and Ball, °C	T 53	65+	64-
Solubility, %	T 44	97.5+	---
DSR @ 82°C; G*/Sin δ, 10 rad / s, kPa	T 315	1.0+	---

¹ At the option of Engineer.

² Sieve tests may be waived if no application problems are present in the field.

SECTION 1003 – AGGREGATES:

Subsection 1003.02 – Aggregates for Portland Cement Concrete and Mortar (07/07),

Pages 763 – 766.

Delete the contents of Heading (c), Aggregates for Types B and D Pavements, and substitute the following.

(c) Aggregates for Types B and D Pavements: For the combined aggregates for the proposed portland cement concrete pavement mix, the percent retained based on the dry weight (mass) of the total aggregates shall meet the requirements of Table 1003-1A for the type of pavement specified in the plans. Additionally, the sum of the percents retained on any two adjacent sieves so designated in the table shall be at least 12 percent of the total combined aggregates. The maximum amounts by weight (mass) of deleterious materials for the total aggregate shall be the same as shown in Subsection 1003.02(b).

Table 1003-1A
Aggregates for Types B and D Pavements

U.S. Sieve	Metric Sieve	Percent Retained of Total Combined Aggregates	
		Pavement Type	
		Type B	Type D
2 1/2 inch	63 mm	0	0
2 inch	50 mm	0	0-20
1 1/2 inch	37.5 mm	0-20	0-20
1 inch	25.0 mm	0-20	5-20
3/4 inch	19.0 mm	5-20	5-20
1/2 inch	12.5 mm	5-20	5-20
3/8 inch	9.5 mm	5-20	5-20
No. 4	4.75 mm	5-20	5-20
No. 8	2.36 mm	5-20	5-20
No. 16	1.18 mm	5-20	5-20
No. 30	600 µm	5-20	5-20
No. 50	300 µm	0-20	0-20
No. 100	150 µm	0-20	0-20
No. 200	75 µm	0-5	0-5

Note: For the sieves in the shaded areas, the sum of any two adjacent sieves shall be a minimum of 12 percent of the total combined aggregates.

Each type of aggregate to be used in the proposed mixture shall be sampled and tested individually. The percent of total combined aggregates retained shall be determined mathematically based on the proportions of the combined aggregate blend. All gradation calculations shall be based on percent of dry weight (mass).

Subsection 1003.03 – Base Course Aggregates (07/08), Page 767 – 768.

Add the following:

(e) Blended Calcium Sulfate: When blended calcium sulfate base course material is allowed on the plans, it shall consist of calcium sulfate from a source approved by the Materials and Testing Section and be blended with an approved aggregate or lime. The source shall have a quality control program approved by the Materials and Testing Section. The source shall have been given environmental clearance by the Department of Environmental Quality for the intended use, and written evidence of such environmental clearance shall be on file at the Materials and Testing Section. DOTD monitoring for compliance with environmental regulations will be limited to the pH testing stated herein below. The blended material shall be non-plastic and reasonably free from organic and foreign matter. The pH shall be a minimum of 5.0 when tested in accordance with DOTD TR 430. Re-evaluation will be required if the source of the aggregate or lime that is blended with the calcium sulfate changes.

Blended calcium sulfate material used as base course shall comply with the following gradation requirements when tested in accordance with DOTD TR 113, modified to include a

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maximum drying temperature of 140°F (60°C). Sampling shall be taken from an approved stockpile at the point of origin.

<u>U.S. Sieve</u>	<u>Metric Sieve</u>	<u>Percent Passing</u>
1-1/2 inch	37.5 mm	60 - 100
1 inch	25.0 mm	40 - 80
3/4 inch	19.0 mm	30 - 70
No. 4	4.75 mm	20 - 65
No. 200	75 µm	0 - 25

Blended calcium sulfate shall be sampled in accordance with the requirements for stone in Section 302 of the Materials Sampling Manual.

Subsection 1003.09 – Nonplastic Embankment (03/09), Pages 775 and 776.

Delete Heading (b) and substitute the following.

(b) Stone: Stone shall be coarse stone from a source listed on QPL 2. For applications requiring lightweight embankment, the stone shall have a dry rodded unit weight (mass) of no greater than 95 pounds per cubic foot (1520 kg/cu m) when tested in accordance with AASHTO T19. Stone shall comply with the following gradation:

<u>U.S. Sieve</u>	<u>Metric Sieve</u>	<u>Percent Passing</u>
2 inch	50 mm	100
1 1/2 inch	37.5 mm	85 - 100
3/4 inch	19.0 mm	35 - 88
No. 4	4.75 mm	0 - 10

SECTION 1005 – JOINT MATERIALS FOR PAVEMENTS AND STRUCTURES:

Subsection 1005.04 – Combination Joint Former/Sealer (11/05), Pages 782 and 783.

Delete Heading (a) and substitute the following.

(a) Description: This joint former/sealer is intended for use in simultaneously forming and sealing a weakened plane in portland cement concrete pavements.

The material shall consist of an elastomeric strip permanently bonded either mechanically or chemically at the top of each of two rigid plastic side frames and covered with a removable plastic top cap. Side frames shall be of such configuration that when the sealer is inserted into plastic concrete and vibrated, a permanent bond forms between side frames and concrete.

Delete Heading (b)(1) and substitute the following.

(1) Elastomer: The elastomer strip portion of the material shall be manufactured from vulcanized elastomeric compound using polymerized chloroprene or thermoplastic vulcanizate as the base polymer, and shall comply with the following requirements:

Property	ASTM Test Method	Requirements	
		Polymerized Chloroprene	Thermoplastic Vulcanizate
Tensile Strength, kPa, Min.	D 412	12,400	7,400
Elongation at Break, % Min.	D 412	200	400
Hardness, Shore A	D 2240	65 ± 10	65 ± 10
Properties after Aging, 70 h @ 100°C	D 573		
Tensile Strength, % Loss, Max.		20	20
Elongation, % loss, Max.		25	25
Hardness, pts. increase, Max.		10	10
Ozone Resistance, 20% strain or bentloop, 300 pphm in air, 70 h @ 40°C	D 1149	no cracks	no cracks
Oil Swell, IRM 903, 70 h @ 100°C, wt change, % Max.	D 471	45	75

Delete Headings (b)(2) and (b)(3) and substitute the following:

(2) Bond of Elastomer to Plastic: The force required to shear the elastomer from the plastic shall be a minimum of 5.0 pounds per linear inch (90 g/mm) of sealer when tested in accordance with DOTD TR 636.

(3) Bond of Plastic to Cement Mortar: This bond will be evaluated and shall meet the following requirements:

The force required to separate the cement mortar from the plastic shall be a minimum of 5.0 pounds per linear inch (90 g/mm) of sealer when tested in accordance with DOTD TR 636.

SECTION 1006 – CONCRETE AND PLASTIC PIPE:

Subsection 1006.09 – Plastic Yard Drain Pipe (06/07), Page 789.

Delete the contents of Subheading (a)(3), Ribbed Polyvinyl Chloride Pipe (RPVCP) and substitute the following.

Ribbed Polyvinyl Chloride Pipe (RPVCP): Ribbed Polyvinyl Chloride Pipe shall comply with ASTM F 794, Series 46 or ASTM F 949 (46 psi).

SECTION 1013 – METALS:

Subsection 1013.09 – Steel Piles (08/06) Page 822.

Delete the title and references to “Steel Piles” in this subsection and substitute “Steel H Piles”.

SECTION 1015 – SIGNS AND PAVEMENT MARKINGS:

All subsections within Section 1015 (10/11), Pages 831 – 849.

Delete Section 1015, Signs and Pavement Markings and substitute the following:

Section 1015
Signs and Pavement Markings

1015.01 GENERAL REQUIREMENTS. The materials shall comply with these specifications, the plans and the MUTCD. When directed, the contractor shall furnish and prepare samples for testing in accordance with Department instructions.

1015.02 METALS.

(a) Ferrous Metals:

(1) Structural Steel: Structural steel for posts, stringers, framing and miscellaneous steel shall comply with AASHTO M 270, Grade 36 (M 270M, Grade 250). Steel shall be galvanized in accordance with Subsection 811.12.

(2) Steel Pipe: Steel pipe or tubing for structures shall be Schedule 40 (STD) complying with ASTM A 53, Type E or Type S Grade B, or hot formed tubing complying with ASTM A 36 (ASTM A 36M) and ASTM A 501.

(3) Steel Posts for Small Signs, Markers and Delineators: Posts shall be steel of the flanged channel type shown on the plans, galvanized after fabrication in accordance with Subsection 811.12. Before fabrication, posts shall be within 3.5 percent of the specified weight (mass).

Posts shall be fabricated from steel complying with either ASTM A 499, Grade 60 with chemical properties conforming to ASTM A 1 for 91 -lb/yd (45 kg/m) or heavier rail steel, or ASTM A 576, Grade 1080 with 0.10 percent -0.20 percent silicon. Holes 3/8 inch (10 mm) in diameter shall be drilled or punched through the middle of each post on one inch (25-mm) centers for at least 36 inches (900 mm) from the top of each post.

(b) Aluminum Alloy: Structural members shall be aluminum complying with ASTM B 221 (ASTM B 221M) or ASTM B 429, Alloy 6061-T6. Miscellaneous aluminum shall comply with ASTM B 209 (ASTM B 209M), Alloy 6061-T6.

(c) Fittings:

(1) Structural Bolts, Nuts and Washers: High strength bolts shall be ASTM A 325 (ASTM A 325M), and other bolts shall be ASTM A 307, Grade A or Grade B. Bolts shall have hexagonal heads and be supplied with two flat and one lock washer and hexagonal-head nut. Bevel washers, where required, shall be wrought steel. Bolts, nuts and washers shall be galvanized in accordance with ASTM A 153 or by an approved mechanical galvanizing process complying with ASTM B 695 that provides the same coating thickness.

Anchor bolts shall be AASHTO M 270, Grade 36 (M 270M, Grade 250) steel except the maximum tensile strength shall be 88,000 psi (605 MPa) and galvanized in accordance with Subsection 811.12 unless otherwise specified.

Stainless steel bolts shall comply with ASTM A 320 (ASTM A 320M), Grade B 8, annealed or approved equal.

(2) Fasteners: Fasteners used in fabricating sign faces, including splice plates for joining two panels, sills and border angles, and attaching route marker shields shall be 1/4 inch (6 mm) aluminum blind rivets that provide positive mandrel retention. These rivets shall have a minimum tensile strength of 875 pounds (397 kg) and a minimum sheer strength of 850 pounds (386 kg).

Fasteners, used in attaching Interstate, Louisiana, and U.S. shields to the sign panel, shall be manufactured from aluminum alloy with brasier heads, complying with ASTM B 316 (ASTM B 316M), Alloy 2024-T4.

Fasteners used in attaching demountable legend to sign faces (except for shields) shall be 1/8 inch (3 mm) diameter blind rivets manufactured from aluminum alloy complying with ASTM B 316 (ASTM B 316M), Alloy 1100-H14.

Fasteners for delineator, object marker and milepost assemblies shall be vandal resistant and will be subject to approval prior to use.

1015.03 FLEXIBLE POSTS. Flexible posts for small signs, markers and delineators shall be approved products listed in QPL 39.

1015.04 SIGN PANELS.

(a) Permanent Sign Panels: Flat panels shall be aluminum sheets or plates complying with ASTM B 209, Alloy 6061-T6 or Alloy 5052-H38. Extruded aluminum panels shall comply with ASTM B 221 (ASTM B 221M), Alloy 6063-T6 and after fabrication, have a flatness equal to or less than 0.031 inch per foot of length and 0.004 inch per inch of width.

(b) Temporary Sign Panels: Substrate for barricade panels shall be either wood or rigid thermoplastic. Substrate for portable signs shall be aluminum, wood or plastic. Substrate for post mounted signs shall be aluminum, wood, rigid thermoplastic or aluminum clad low density polyethylene plastic.

(1) Aluminum: Aluminum sheeting shall be 0.080 inch (2 mm) thickness complying with ASTM B 209 (ASTM B 209M), Alloy 6061-T6 or Alloy 5052-H38.

(2) Wood: Plywood sheeting of exterior type Grades either High Density Overlay or Medium Density Overlay, are acceptable for use provided the following requirements are met.

Panels shall be a minimum of 5/8 inch (15 mm) thick and shall comply with the latest American Plywood Association specifications and be identified with the APA edge mark or back stamp to verify inspection and testing. Prior to application of reflective sheeting, the surface shall be abraded with steel wool or fine sandpaper, and wiped thoroughly clean. The surface shall be allowed to dry a minimum of 8 hours prior to application of sheeting. Cut edges of plywood panels shall be sealed with an approved aluminum pigmented polyurethane sealer.

(3) Plastic: Plastic substrate for barricade panels and signs shall be as follows.

a. Fiber Reinforced Vinyl (PVC): The substrate shall have a nominal composite thickness of 0.04 inches (1 mm) and be bonded to an approved retroreflective material by the manufacturer.

b. Rigid Thermoplastic: Rigid thermoplastic substrate shall consist of either High Density Polyethylene (HDPE) or High Density Polycarbonate (HDPC). The rigid thermoplastic for barricade panels shall be hollow core HDPE or HDPC with a minimum

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thickness of 0.625 inch (16 mm). The thermoplastic for sign panels shall be either 0.40 inch (10 mm) thick thin wall, fluted substrate or 0.625 inch (16 mm) thick blow molded substrate. Substrates shall be sufficiently rigid to maintain a flat face and shall be capable of attachment to the sign mounting in such a manner as not to crush or otherwise deform the substrate. Reflectorized sheeting applied to rigid thermoplastic shall have its manufacturer's approval for use on the substrate.

c. Aluminum Clad Low Density Polyethylene (AL/LDPE) Plastic: The aluminum clad low density polyethylene plastic substrate shall be 0.080 inch (2 mm) thick. The substrates shall be sufficiently rigid to maintain a flat face and shall be capable of attachment to the sign mounting in such a manner as not to crush or otherwise deform the substrate. Reflectorized sheeting applied to aluminum clad low density polyethylene shall have its manufacturer's approval for use on this substrate.

1015.05 REFLECTIVE SHEETING.

(a) Permanent and Temporary Standard Sheeting: Reflective sheeting shall be one of the following standard types as specified on the plans and complying with ASTM D 4956 except as modified herein. Permanent warning, regulatory, guide and supplemental guide sign sheeting shall meet the requirements of DOTD Type X as detailed below. Reflective sheeting for temporary signs and devices shall meet the requirements of ASTM D 4956 Type III except as noted in Subsection 1015.05(f). Reflective sheeting shall be an approved product listed in QPL 13.

Type III - A high-intensity retroreflective sheeting that is typically encapsulated glass-bead retroreflective material.

Type VI - An elastomeric, high-intensity retroreflective sheeting without adhesive. This sheeting is typically a vinyl microprismatic retroreflective material.

Type X - A super high-intensity retroreflective sheeting having highest retroreflectivity characteristics at medium distances. This sheeting is typically an unmetalized microprismatic retroreflective element material.

(b) Fluorescent Pink Retroreflective Sheeting: Signs for temporary control of traffic through incident management areas shall be Type VI fluorescent pink retroreflective sheeting and shall comply with the MUTCD. Temporary traffic control signs for incident management shall be placed to notify motorists of upcoming incidents on the roadway, and shall be removed from public view once the incident has been managed. Physical properties shall comply with ASTM D 4956. Photometric properties shall be as follows.

(1) Retroreflectivity: Minimum Coefficients of Retroreflection shall be as specified in Table 1015-1.

Table 1015-1
Coefficients of Retroreflection for Fluorescent Pink Sheeting¹

Observation Angle, degrees	Entrance Angle, degrees	Fluorescent Pink
0.2	-4	100
0.2	+30	40
0.5	-4	40
0.5	+30	15

¹Minimum Coefficient of Retroreflection (R_A) ($\text{cd lx}^{-1}\text{m}^{-2}$)

(2) Color and Daytime Luminance: Color Chromaticity Coordinates and Daytime Luminance Factors shall be as specified in Table 1015-2.

Table 1015-2
Fluorescent Pink Color Specifications Limits (Daytime)

Chromaticity Coordinates (corner points) ¹								Luminance Factor, min.
1		2		3		4		Y%
x	y	x	y	x	Y	x	y	25
0.450	0.270	0.590	0.350	0.644	0.290	0.536	0.230	

¹The four pairs of chromaticity coordinates measured with CIE 2° Standard Observer and 45/0 (0/45) geometry and CIE D65 Standard Illuminant.

(c) DOTD Type X Retroreflective Sheeting: Physical properties shall comply with ASTM D 4956. Color shall conform to ASTM D 4956, Table 11. Luminance shall conform to ASTM D 4956, Table 2. Retroreflectivity properties shall be as follows:

(1) Retroreflectivity: Minimum Coefficients of Retroreflection shall be as specified in Table 1015-1A.

Table 1015-1A
Coefficients of Retroreflection for DOTD Type X Sheeting¹

Observation Angle, (degrees)	0.2	0.2	0.5	0.5
Entrance Angle, (degrees)	-4	+30	-4	+30
White	560	280	200	100
Yellow	420	210	150	75
Orange	210	105	75	37
Green	56	28	20	10
Red	84	42	30	15
Blue	28	14	10	5.0
Brown	17	8.4	6.0	3.0
Fluorescent Yellow-Green	450	220	160	80
Fluorescent Yellow	340	170	120	60
Fluorescent Orange	170	84	60	30

¹Minimum Coefficient of Retroreflection (R_A) ($cd\ lx^{-1}m^{-2}$)

(d) Adhesive Classes: The adhesive required for retroreflective sheeting shall be Class 1 (pressure sensitive) as specified in ASTM D 4956.

(e) Accelerated Weathering: Reflective sheeting, when processed, applied and cleaned in accordance with the manufacturer's recommendations shall perform in accordance with the accelerated weathering standards in Table 1015-3.

Table 1015-3
Accelerated Weathering Standards¹

Type	Retroreflectivity ²				Colorfastness ³	
	Orange/ Fluorescent Orange		All colors, except Orange/ Fluorescent Orange		Orange/ Fluorescent Orange	All colors, except Orange/ Fluorescent Orange
III	1 year	80 ⁴	3 years	80 ⁴	1 year	3 years
III (for drums)	1 year	80 ⁴	1 year	80 ⁴	1 year	1 year
VI	1/2 year	50 ⁵	1/2 year	50 ⁵	1/2 year	1/2 year
DOTD X	1 year	80 ⁶	3 years	80 ⁶	1 year	3 years

¹At an angle of 45° from the horizontal and facing south in accordance with ASTM G 7 at an approved test facility in Louisiana or South Florida.

²Percent retained retroreflectivity of referenced table after the outdoor test exposure time specified.

³Colors shall conform to the color specification limits of ASTM D 4956 after the outdoor test exposure time specified.

⁴ASTM D 4956, Table 4.

⁵ASTM D 4956, Table 7.

⁶Table 1015-1A.

(f) Expected Sign Life Data and Performance: The sheeting manufacturer shall supply expected retroreflectivity service life curves for each of the following sign sheeting colors: white, green, blue, brown, red, and yellow. The service life curves shall be plots of the 95 percent expected life plotted on an 'x-y' graph with life years on the 'x-axis' and retroreflectivity on the 'y-axis'. The expected life shall account for worst-case installations, equivalent to an installation in South Louisiana with the sign facing to the South. The sheeting manufacturer shall also supply a table of expected life values taken from the service life curves for Revision Number 2 to the 2003 Edition of the MUTCD minimum reflectivity requirements published in the Federal Register on December 21, 2007.

Reflective sheeting for signs, when processed, applied and cleaned in accordance with the manufacturer's recommendations shall perform outdoors in accordance with the performance standards in Table 1015-4.

Table 1015-4
Reflective Sheeting Performance Standards

Type	Retroreflectivity ¹ -- Durability ²				Colorfastness ³
	Orange/ Fluorescent Orange		All colors, except orange/Fluorescent Orange		
III	3 years	80 ⁴	10 years	80 ⁴	3 years
DOTD X	3 years	80 ⁵	7 years	80 ⁵	3 years

¹Percent retained retroreflectivity of referenced table after installation and the field exposure time specified.

²All sheeting shall maintain its structural integrity, adhesion and functionality after installation and the field exposure time specified.

³All colors shall conform to the color specification limits of ASTM D 4956 after installation and the field exposure time specified.

⁴ASTM D 4956, Table 4.

⁵Table 1015-1A.

(g) Temporary Signs, Barricades, Channelizing Devices, Drums and Cones: Reflective sheeting for temporary signs, barricades and channelizing devices, shall meet the requirements of ASTM D 4956, Type III except that temporary warning construction signs used on the mainline of freeways and expressways shall be fluorescent orange and meet the requirements of DOTD Type X.

Reflective sheeting for vertical panels shall meet the requirements of ASTM D 4956, Type III.

Reflective sheeting for drums shall be a minimum of 6 inches (150 mm) wide and shall meet the requirements of ASTM D 4956, Type III, and the Supplementary Requirement S2 for Reboundable Sheeting as specified in ASTM D 4956. Reflective sheeting for traffic cone collars shall meet the requirements of ASTM D 4956, Type III or Type VI.

(h) Sheeting Guaranty. The contractor shall provide the Department with a guaranty from the sheeting manufacturer stating that if the retroreflective sheeting fails to comply with the performance requirements of this subsection, the sheeting manufacturer shall do the following:

Table 1015-5
 Manufacturer's Guaranty-Reflective Sheeting

Type	Manufacturer shall restore the sign face in its field location to its original effectiveness at no cost to the Department if failure occurs during the time period ¹ as specified below		Manufacturer shall replace the sheeting required to restore the sign face to its original effectiveness at no cost to the Department if failure occurs during the time period ¹ as specified below
	Orange/Fluorescent Orange	All colors, except orange/Fluorescent Orange	All colors, except orange/Fluorescent Orange
III	<3 years	<7 years	7-10 years
DOTD X	<3 years	<5 years	5-7 years

¹ From the date of sign installation.

Replacement sheeting for sign faces, material, and labor shall carry the unexpired guaranty of the sheeting for which it replaces.

The sign fabricator shall be responsible for dating all signs with the month and year of fabrication at the time of sign fabrication. This date shall constitute the start of the guaranty obligation period.

1015.06 NONREFLECTIVE SHEETING.

(a) General Requirements: Nonreflective sheeting film shall consist of an extensible, pigmented, weather-resistant plastic film. Face side of film shall be supported and protected by a paper liner which is readily removable after application without the necessity of soaking in water or other solvents. Colors shall be matched visually and be within the limits shown in Table 17 of ASTM D 4956.

(b) Adhesive Requirements: Sheeting shall have a pre-coated pressure sensitive adhesive backing or a tack-free heat-activated adhesive backing, either of which may be applied without additional coats on either sheeting or application surface. Adhesive shall comply with ASTM D 4956, Class 1 (pressure sensitive).

(c) Physical Characteristics: The film shall be readily cut by normal fabricating methods without cracking, checking or flaking. Applied film shall be free from ragged edges, cracks and blisters. The material shall have demonstrated its ability to withstand normal weathering without checking, cracking or excessive color loss.

1015.07 SIGN ENAMELS, PAINTS, SILK SCREEN PASTE AND OVERLAY FILM.

(a) Sign Enamels and Paints: These shall be applied in accordance with the sheeting manufacturer's recommendations. Final appearance as well as materials used shall be subject to approval.

(b) Silk Screen Paste: Constituents used in manufacture of silk screen paste shall meet approval of the engineer. Silk screen paste shall be mixed at the factory, well ground to a uniform consistency and smooth texture, and shall be free from water and other foreign matter. It shall dry within 18 hours to a film that does not run, streak, or sag. Paste which has livered, hardened or thickened in the container, or in which pigment has settled out so that it cannot be readily broken up with a paddle to a uniform usable consistency, will be rejected. Paste and thinner shall be used in accordance with the sheeting manufacturer's recommendations.

Paste shall have proper pigmentation and consistency for use in silk screen equipment. The material shall produce the desired color and the same retroreflectivity values as required for reflective sheeting of the same type and color when applied on reflective sheeting background. Paste shall meet the quality and test requirements for appearance, coarse particles, and moisture and water resistance as specified for sign paints.

(c) Overlay Film: Transparent electronic cuttable overlay film shall produce the desired color and the same reflectivity values as required for reflective sheeting of the same type and color when applied on reflective sheeting background.

1015.08 TEMPORARY PAVEMENT MARKINGS.

(a) Temporary Tape: Temporary tape shall comply with ASTM D 4592, Type I (removable) or Type II (non-removable) and shall be an approved product listed in QPL-60.

(b) Painted Stripe: Paint shall be an approved traffic paint complying with Subsection 1015.12. Glass beads for drop-on application shall comply with Subsection 1015.13.

(c) Temporary Raised Pavement Markings for Asphaltic Surface Treatment: Temporary raised pavement markers for asphaltic surface treatment shall be flexible reflective tabs having a nominal width of 4 inches (10 cm). The markers shall be yellow with amber reflective area on both sides. The body of the marker shall consist of a base and vertical wall made of polyurethane or other approved material and shall be capable of maintaining a reasonable vertical position after installation. The initial minimum Coefficient of Luminous Intensity at an entrance angle of -4 degrees and an observation angle of 0.2 degrees shall be 230 mcd/lx when measured in accordance with ASTM E 810.

The reflective material shall be protected with an easily removable cover of heat resistant material capable of withstanding and protecting the reflective material from the application of asphalt at temperatures exceeding 325°F (160°C).

1015.09 RAISED PAVEMENT MARKERS. Markers shall be either nonreflectorized or reflectorized, as specified. Markers shall be approved products listed in QPL 9. Infrared curves of materials used in markers shall match approved curves on file at the Department's Materials and Testing Section.

(a) Nonreflectorized Markers:

(1) Description: Nonreflectorized markers shall consist of an acrylonitrile butadiene styrene polymer or other approved material, and shall be 4-by-6-inches (100-by-150-mm).

(2) Physical Requirements: Markers shall comply with the compressive strength requirements of ASTM D 4280. The color shall be in accordance with the plans and the MUTCD.

(b) Reflectorized Markers: Reflectorized markers shall comply with ASTM D 4280, Designation H and Designation F. The type and color shall be in accordance with the plans and the MUTCD. The markers shall be either standard having approximate base dimensions of 4-by-4-inches (100-by-100-mm) and a maximum height of 0.80 inches (20 mm) or low profile having approximate base dimensions of 4-by-2-inches (100-by-50-mm) and a maximum height of 0.60 inches (15 mm).

(c) Adhesive:

(1) Epoxy Adhesive: Epoxy adhesive shall be Type V epoxy resin system complying with Subsection 1017.02.

(2) Bituminous Adhesive: The adhesive shall conform to ASTM D 4280 for asphaltic surfaces and D 4280 Type II or Type III for concrete surfaces and shall be an approved product listed in QPL 59.

1015.10 THERMOPLASTIC PAVEMENT MARKINGS.

(a) Description: This specification covers hot-sprayed, hot-extruded, and preformed thermoplastic reflective compound for pavement markings on asphaltic or portland cement concrete pavement. Thermoplastic marking material applied to asphaltic surfaces shall consist of an alkyd based formulation. Thermoplastic marking material applied to portland cement concrete surfaces shall consist of either an alkyd based or hydrocarbon based formulation. Material shall be so manufactured as to be applied by spray (40 mil (1.0 mm)) or extrusion (90 mil (2.3 mm)) to pavement in molten form, with internal and surface application of glass spheres, and upon cooling to normal pavement temperature, shall produce an adherent, reflectorized pavement marking of specified thickness and width, capable of resisting deformation. Black thermoplastic marking material shall be used according the standard plans on all Portland cement concrete pavement. This material shall not require glass beads. Material shall not scorch, break down, or deteriorate when held at the plastic temperature specified in Subsection 732.03(f) (1) for 4 hours or when reheated four times to the plastic temperature. Temperature-vs.-viscosity characteristics of plastic material shall remain constant when reheated four times, and shall be the same from batch to batch. There shall be no obvious change in color of material as the result of reheating four times or from batch to batch.

For yellow thermoplastic material, the type and amount of yellow pigment shall be at the option of the manufacturer, providing all other requirements of this specification are met. However, the pigment for yellow thermoplastic shall be lead free and shall meet the regulatory level of non-hazardous waste as defined by 40 CFR 261.24 when tested in accordance with EPA Method 1311, toxicity Characteristics Leaching Procedures. The manufacturer shall provide certification that the material provided meets these requirements.

(b) Suitability for Application: Thermoplastic material shall be a product especially compounded for pavement markings. Markings shall maintain their original dimension and placement and shall not smear or spread under normal traffic at temperatures below 140°F (60°C). Markings shall have a uniform cross section. Pigment shall be evenly dispersed

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throughout the material thickness. The exposed surface shall be free from tack and shall not be slippery when wet. Material shall not lift from pavement in freezing weather. Cold ductility of material shall be such as to permit normal movement with the pavement surfaced without chipping or cracking.

(c) Standard (Flat) 90 mil (2.3 mm) or Greater Thermoplastic Pavement Markings: White and yellow thermoplastic shall be approved products listed in QPL 63 and shall comply with AASHTO M 249 as modified herein. All other colors are not required to be on the QPL.

(1) Color:

a. Laboratory Performance: The yellow thermoplastic shall comply with the requirements of Table 1015-6 when tested in accordance with ASTM E 1349.

Table 1015-6
 Color Specification Limits (Daytime)

Color	1		2		3		4	
	x	y	x	y	x	y	x	y
Yellow	0.4756	0.4517	0.4985	0.4779	0.5222	0.4542	0.4919	0.4354

(The four pairs of chromaticity coordinates determine the acceptable color in terms of the CIE 1931 Standard Colorimetric System measured with Standard 2° Observer and Standard Illuminant D65.)

b. Field Performance: The initial daytime color and luminance factor (Cap Y) readings may be taken by the Department, as required by the engineer, within 7 to 30 days after installation to verify compliance with ASTM D 6628.

(2) Whiteness Index: The white thermoplastic shall have a minimum whiteness index of 40 when tested according to ASTM E 313.

(3) Filler: For black thermoplastic, the filler to be incorporated with the resins shall be a white calcium carbonate, silica, or any approved equivalent.

(4) Retroreflectivity: Within 30 days of application, the initial retroreflectivity readings shall be taken by the contractor with a DOTD inspector present during testing. Upon completion of the testing the DOTD inspector shall immediately take possession of a copy of the retroreflectivity readings in either hard copy (8-1/2 inch by 11 inch) or electronic format as noted below. Additionally, documentation shall be provided to the Department that the instrument has been calibrated per manufacturer's requirements.

For each material type, a different set of readings shall be taken in accordance with Table 732-1, "Field Testing of Plastic Pavement Markings" in Section 732. If the data was provided in hard copy as noted above, the data shall be given to the Department in electronic Microsoft Excel® (xls) format downloaded from the reflectometer data within 30 days. Each spreadsheet shall have a header that states all of the following:

1. Project number;
2. Date material installed;
3. Type of material installed; and
4. The beginning mile-point to ending mile-point of material installed.

The format for the excel spreadsheet shall be (description, date, and reading). In the description cell the format shall be Route (i.e. LA, US, or I), Direction (i.e. N, S, E, or W), Mile Point and Color (W or Y).

Examples:

- LA 115W; 23; Y.
- I-10; S; 4; W.

For 90 mil thermoplastic, the initial retroreflectance for the in-place marking shall have a minimum retroreflectance value of 375 mcd/lux/sq m for white and 250 mcd/lux/sq m for yellow. Readings taken by the Department before the expiration of the Guarantee Period of Subsection 104.05 shall be at least 325 mcd/lux/sq m or greater for white and 200 mcd/lux/sq m or greater for yellow when measured with a geometry of 1.05 degrees observation angle and 88.76 degrees entrance angle.

Black thermoplastic pavement markings shall not require any reflectivity testing.

For pavement legends and symbols and non-lane delineation striping, the initial retroreflectance for the in-place markings shall be in accordance with Section 732, Table 732-2.

(d) Standard (Flat) 40 mil (1.0 mm) Thermoplastic Pavement Markings: Materials shall comply with AASHTO M 429 as modified herein:

(1) Composition: The material shall meet the following composition requirements:

	White	Yellow
Binder	25 percent minimum	25 percent minimum
Glass Spheres	30 percent minimum	30 percent minimum

% by weight (mass)

The intermix glass spheres contained in the thermoplastic material shall conform to AASHTO M 247 Type I.

(2) Color:

a. Laboratory Performance: The yellow thermoplastic shall comply with the requirements of Table 1015-6, "Color Specification Limits (Daytime)" when tested in accordance with ASTM E 1349.

b. Field Performance: The initial daytime color and luminance factor (Cap Y) reading may be taken by the Department, as required by the engineer, within 7 to 30 days after installation to verify compliance with ASTM D 6628.

(3) Softening Point: After heating the marking compound for 4 hours ± 5 min. at 375°F ± 3°F (190°C ± 2°C) and testing in accordance with ASTM E 28, the material shall have a minimum softening point of 190°F (88°C) as measured by the ring and ball method.

(4) Indentation Resistance: The material, when tested in accordance with ASTM D 2240, Shore Durometer, A2, shall not exceed 40 when tested at 115°F ± 3°F (46.1°C ± 2°C).

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(5) Retroreflectivity: Within 30 days of application, the initial retroreflectivity readings shall be taken by the contractor with a DOTD inspector present during testing. Upon the completion of the testing the DOTD inspector will immediately take possession of a copy of the retroreflectivity readings in either hard copy (8-1/2 inch by 11 inch) or electronic format as noted below. Additionally, documentation shall be provided to the Department that the instrument has been calibrated per manufacturer's requirements.

For each material type, a different set of readings shall be taken in accordance with Table 732-1, "Field Testing of Plastic Pavement Markings" in Section 732. If the data was provided in hard copy as noted above, the data shall be given to the Department in electronic Microsoft Excel® (xls) format downloaded from the reflectometer data within 30 days. Each spreadsheet shall have a header that states all of the following:

1. Project number;
2. Date material installed;
3. Type of material installed; and,
4. The beginning mile-point to ending mile-point of material installed.

The format for the excel spreadsheet shall be (description, date, and reading). In the description cell the format shall be Route (i.e. LA, US, or I), Direction (i.e. N, S, E, or W), Mile Point and Color (W or Y).

Examples:

LA 115W; 23; Y
I-10; S; 4; W.

For 40 mil thermoplastic, initial retroreflectance for the in-place marking shall have a minimum retroreflectance of 250 mcd/lux/sq m for white and 175 mcd/lux/sq m for yellow when measured at a geometry of 1.05 degrees observation angle and 88.76 degrees entrance angle (30 m geometry), as detailed in ASTM E 1710. Readings taken by the Department before the expiration of the Guarantee Period of Subsection 104.05 shall be at least 200 mcd/lux/sq m or greater for white and 125 mcd/lux/sq m or greater for yellow when measured with a geometry of 1.05 degrees observation angle and 88.76 degrees entrance angle.

(e) 125 mil (3.2 mm) Thermoplastic Pavement Markings: Materials shall comply with AASHTO M 429 as modified herein:

Thickness of material not including drop on beads shall not be less than 125 mils (3.2mm) for gore markings, crosswalks, stop lines, word and symbol markings. This material can be applied either by standard thermoplastic or preformed thermoplastic material.

Extruded or Ribbon Thermoplastic Materials shall comply with the same requirements in 1015.10(c).

Preformed Thermoplastic Material shall be approved products listed on QPL 76.

1015.11 PREFORMED PLASTIC PAVEMENT MARKING TAPE.

(a) General: Preformed plastic pavement marking tape shall be approved products listed on QPL 64 and shall comply with ASTM D4505 Retroreflectivity Level I or Level II, or DOTD Intersection Grade (as specified below), except as modified herein. The marking tape shall be Class 2 or 3. The type and color shall be in accordance with the plans and the MUTCD.

(b) Thickness: All preformed plastic pavement marking tape shall have a minimum overall thickness of 0.060 inches (1.5 mm) when tested without the adhesive.

(c) Friction Resistance: The surface of the Retroreflectivity Level II preformed plastic pavement marking tape shall provide a minimum frictional resistance value of 35 British Polish Number (BPN) when tested according to ASTM E303. The surface of the Retroreflectivity Level I and DOTD Intersection Grade preformed plastic pavement marking tape shall provide a minimum frictional resistance value of 45 BPN when tested according to ASTM E 303. Values for the Retroreflectivity Level I material with a raised surface pattern as defined in ASTM D 4505 are calculated by averaging values taken at downweb and at a 45 degrees angle from downweb.

(d) Retroreflective Requirements: The preformed plastic pavement marking tape shall have the minimum initial specific luminance values shown in Table 1015-7 when measured in accordance with ASTM D 4061.

Table 1015-7
 Specific Luminance of Preformed Plastic Tape

Type	Observation Angle, degrees	Entrance Angle, degrees	Specific Luminance (mcd/sq m/lx)	
			White	Yellow
Retroreflectivity Level I	1.05	88.76	500	300
DOTD Intersection Grade	1.05	88.76	375	250
Retroreflectivity Level II	1.05	88.76	250	175

(e) Durability Requirements: The DOTD Intersection Grade preformed plastic pavement marking tape shall show no appreciable fading, lifting or shrinkage for at least 12 months after placement when placed in accordance with the manufacturer's recommended procedures on pavement surfaces having a daily traffic count not to exceed 15,000 ADT per lane.

The Retroreflectivity Level I preformed plastic pavement marking tape shall show no appreciable fading, lifting or shrinkage for at least 4 years after placement for longitudinal lines and at least 2 years after placement for symbols and legends.

The Retroreflectivity Level I preformed plastic pavement marking tape shall also retain the following reflectance values for the time period detailed in Table 1015-8.

Table 1015-8
 Retained Specific Luminance for Retroreflectivity Level I
 Preformed Plastic Pavement Marking Tape

Time	Observation Angle, degrees	Entrance Angle, degrees	Specific Luminance (mcd/sq m/lx)	
			White	Yellow
1 year	1.05	88.76	400	240
4 years (2 years for symbols and legend)	1.05	88.76	100	100

(f) Plastic Pavement Marking Tape Guaranty (DOTD Intersection Grade and Retroreflectivity Level I): If the plastic pavement marking tape fails to comply with the performance and durability requirements of this subsection within 12 months for DOTD Intersection Grade and 4 years for Retroreflectivity Level I, the manufacturer shall replace the plastic pavement marking material at no cost to the Department.

1015.12 TRAFFIC PAINT. The contractor shall use water-borne traffic paint. The same type paint shall be used throughout the project. Each paint container shall bear a label with the name and address of manufacturer, trade name or trademark, type of paint, number of gallons, batch number and date of manufacture.

Paints shall be approved products listed in QPL 36, shall show no excessive settling, caking or increase in viscosity during 6 months of storage, and shall be readily stirred to a suitable consistency for standard spray gun application.

An infrared curve shall be generated in accordance with DOTD TR 610 and compared with the standard curve made during the initial qualification process.

For yellow paint material, the type and the amount of yellow pigment shall be at the option of the manufacturer, providing all of the requirements of this specification are met. However, the pigment for yellow paint shall be lead free and shall meet the regulatory level of non-hazardous waste as defined by 40 CFR 261.24 when tested in accordance with EPA Method 1311, Toxicity Characteristics Leaching Procedures. The manufacturer shall provide certification that the material provided meets these requirements.

(a) Vacant

(b) Water Borne Traffic Paint: This material shall be a rapid setting waterborne compound suitable for use with hot application equipment. The paint shall contain Rohm & Hass Rhoplex Fastrack HD-21, an emulsion with 48.5 percent solids content, Dow DT 400NA acrylic emulsion with 49.5 – 51.5 percent solids content, or approved equal. The material shall meet the requirements of Table 1015-10.

Table 1015-10
Water Borne Traffic Paint Physical Properties

<u>Property</u>	<u>Test Method</u>	<u>Requirements</u>	
		<u>Min.</u>	<u>Max.</u>
pH	ASTM E 70	9.9	---
Viscosity, at 25°C Krebs Unit	ASTM D 562	78	95
Drying Time, minutes ¹	ASTM D 711	---	10
Total Solids, % by mass	ASTM D 2369	73	79
Percent Pigment ²	ASTM D 3723	55	62
Nonvolatiles in Vehicle, % by weight	ASTM D 215	43	---
Weight per Gallon, lb/gal	ASTM D 1475	---	---
White		13.7	---
Yellow		13.1	---
Daylight Reflectance, %	ASTM E 1349		
White		80	---
Yellow		50	---
Fineness of Grind	ASTM D 1210	3	---
Color	3		Pass
Shelf Life, months		12	---
Pigment Composition	4		Pass
Infrared Spectroscopy (IR)	DOTD TR 610		Pass

¹Drying time to no track - Paint applied at 15 mils (375 µm) wet on the road surface with paint heated to 120-150°F (50-65°C) shall not show tracking when a standard size automobile crosses in a passing maneuver at 3 minutes.

²No theoretical empirical factor shall be applied in determining the percent of the paint. Percent pigment shall not be calculated by adding back the burned-off organic constituents of the pigment.

³Color (without glass beads) - Yellow paint shall comply with the requirements of Table 1015-11 when tested in accordance with ASTM E 1349. White shall be a clean, bright, untinted binder.

⁴The white paint shall contain a minimum of 1.0 pound per gallon (120 g/L) of rutile titanium dioxide (TiO₂) as determined using DOTD TR 523. The rutile titanium dioxide shall comply with ASTM D 476.

Table 1015-11
 Water Borne Traffic Paint Color Specification Limits (Daytime)

Color	1		2		3		4	
	x	y	x	y	x	y	x	y
Yellow	0.493	0.473	0.518	0.464	0.486	0.428	0.469	0.452

(The four pairs of chromaticity coordinates determine the acceptable color in terms of the CIE 1931 Standard Colorimetric System measured with Standard 2° Observer and Standard Illuminant D65.)

(c) Initial Retroreflectivity: Within 30 days of application, the initial retroreflectivity readings shall be taken by the contractor with a DOTD inspector present during testing. Upon completion of the testing, the DOTD inspector shall immediately take possession of a copy of the retroreflectivity readings in either hard copy (8-1/2 inch by 11 inch) or electronic format as noted below. Additionally, documentation shall be provided to the Department that the instrument has been calibrated per manufacturer’s requirements.

For each material type a different set of readings shall be taken in accordance with Table 737-1, “Field Testing of Painted Pavement Markings” in Section 737. If the data was provided in hard copy as noted above, the data shall be given to the Department in electronic Microsoft Excel® (xls) format downloaded from the reflectometer data within 30 days. Each spreadsheet shall have a header that states all of the following:

1. Project number;
2. Date material installed;
3. Type of material installed; and,
4. The beginning mile-point to ending mile-point of material installed.

The format for the excel spreadsheet shall be (description, date, and reading). In the description cell the format shall be Route (i.e. LA, US, or I), Direction (i.e. N, S, E, or W), Mile Point and Color (W or Y).

Examples:

LA 115W; 23; Y
 I-10; S; 4; W.

For traffic paint, initial retroreflectance shall have a minimum retroreflectance of 250 mcd/lux/sq m for white and 175 mcd/lux/sq m for yellow when measured with geometry of 1.05 degrees observation angle and 88.76 degrees entrance angle (30 m geometry).

(d) Initial Daytime Color and Luminance Factor: For traffic paint, the initial daytime color and luminance factor (Cap Y) will be tested according to and in compliance with the requirements of ASTM D6628. Readings may be taken by the Department from 7 to 30 days after installation to verify compliance with ASTM 6628.

1015.13 GLASS BEADS FOR PAVEMENT MARKINGS. Glass beads for use with painted traffic striping and flat thermoplastic striping shall be transparent, clean, colorless glass, smooth and spherically shaped, free from milkiness, pits, or excessive air bubbles and conform to the specific requirements for the class designated. The beads shall conform to the specification requirements of AASHTO M 247 as modified herein.

(a) Moisture Resistance - Flow Characteristics: The beads shall not absorb moisture in storage. They shall remain free of clusters and lumps and shall flow freely from the dispensing equipment.

(b) Gradation: The testing for gradation of the beads shall be in accordance with ASTM D 1214 and shall meet the gradation requirements of AASHTO M 247, Section 4.1., for the specified type of beads.

(1) Painted Traffic Striping: Glass beads for painted traffic striping shall meet the gradation requirements of AASHTO M 247 Type 3. Table 1015-12A, "Gradation of Refractive Index Glass Beads" may be used as an alternate on chip seal.

Table 1015-12A
 Gradation of 1.9 Refractive Index Glass Beads

U.S. SIEVE (METRIC SIEVE)	PERCENT RETAINED
No. 18 (1.00 mm)	0-5
No. 20 (850 µm)	5-15
No. 30 (600 µm)	10-30
No. 40 (425 µm)	20-40
No. 50 (300 µm)	20-40
PAN	0-5

(2) Flat Profile Thermoplastic Striping: Drop-on beads for flat profile thermoplastic striping shall meet the gradation requirements of Table 1015-13; AASHTO M 247, Type 1, 2, or 4; or Table 1015-12A as determined by the thickness of the striping specified in Table 1015-13.

Table 1015-13
Types of AASHTO M 247 Glass Beads used for
Flat Profile Thermoplastic Striping

THICKNESS	NUMBER OF BEAD DROPS	APPLICATION #1	APPLICATION #2
40 mil spray	Single Drop	AASHTO M247 Type 2 or Table 1015-12A	N/A
90 mils or greater	Double Drop	AASHTO M247 Type 4	AASHTO M 247 Type 1 or Table 1015-12A

(3) 40 mil Spray Thermoplastic Striping: Drop-on beads for 40 mil spray thermoplastic striping shall meet the gradation requirements of Table 1015-13. Table 1015-12A may be used as an alternative.

(c) Roundness: Beads shall have a minimum of 80 percent rounds per screen for the two (2) highest sieve sizes. The remaining sieve sizes shall have no less than 75 percent rounds. AASHTO M 247 Type 1 and Type 2 beads shall be tested according to ASTM D 1155. Other types shall be tested by microscopic examination.

(d) Angular Particles: The beads shall have no more than three (3) percent angular particles per screen.

(e) Refractive Index: The beads shall have a refractive index of 1.50 to 1.52 when tested by the liquid immersion method. Beads conforming to Table 1015-12A shall have a minimum refractive index of 1.90.

(f) Embedment Coating: The large beads for thermoplastic striping shall be coated with an adhesion assuring coating. The smaller AASHTO M 247 Type 1 beads shall be coated to provide free flowing characteristics when tested in accordance with AASHTO M 247 Section 5.3., and assure adhesion. Glass beads shall be properly coated and conform to the requirements when tested as described in DOTD TR 530 Determination of Embedment Coating on Large Embedment Coated Glass Beads for Pavement Markings.

(g) Packaging and Marking: The beads shall be packaged in moisture proofed containers. Each container shall be stamped with the following information: Name and address of manufacturer, shipping point, trademark or name, the wording "Large Embedment Coated Glass Beads", class, weight, lot number and the month and year of manufacture. The container for the AASHTO M 247 Type 1 beads shall be similarly stamped except that the wording shall be "Glass Beads".

(h) Heavy Metal Limits: All glass beads shall not contain more than 75 parts per million of inorganic arsenic, when tested using EPA Method 6010B in conjunction with EPA Method 3052 for sample preparation.

SECTION 1020 – TRAFFIC SIGNALS:

Subsection 1020.01 – Traffic Signal Heads (06/07), Pages 873 – 884.

Delete the contents of Heading (a), General Requirements and substitute the following:

(a) General Requirements: Traffic signal sections, beacon sections and pedestrian signal sections shall be of the adjustable type. Materials and construction of each section shall be the same.

Signals shall be constructed for either 8 or 12-inch (200 mm or 300 mm) lens in accordance with the plans. Signal sections shall have three to five sections per face and beacon sections have only one section per face. Signal sections and associated brackets shall be finished inside and out with two coats of high grade dark olive green enamel, color number 14056 according to Federal Standard No. 595b with each coat independently baked. Visors shall be coated green on the outside and black on the inside. Edges shall be deburred and smooth with no sharp edges.

Subsection 1020.04 – Poles for Traffic Signal Systems (06/07), Pages 890 – 894.

Delete the sixth paragraph of Heading (a), Pedestal Support Signal Poles, and substitute the following.

Pedestals shall be finished with at least one coat of rustproofing primer, applied to a clean surface and one coat of dark olive green enamel, color number 14056 according to Federal Standard No. 595.

**Louisiana Department of Transportation and Development
Supplemental Specification**

The Louisiana Standard Specifications for Roads and Bridges 2006 is amended to include the following:

**Section 830
Repair and Rehabilitation**

830.01 DESCRIPTION

Perform structural repairs and rehabilitation as specified.

830.02 MATERIALS

Materials shall be specific to the required actions of the contract. Comply with the following sections:

Concrete Roadway Barriers	733
Structural Concrete	805
Reinforcing Steel	806
Structural Metals	807
Steel Grid Flooring	808
Movable Bridges	809
Bridge Railings and Barriers	810
Painting and Protective Coatings	811
Concrete Approach Slabs	813
Portland Cement Concrete	901
Epoxy Systems	1017

830.02.1 Structural Concrete Patching

Conform to Table 830-1 for structural concrete patching unless otherwise specified. An exception is made for the specific case of patching tops of decks, where rapid setting patching materials for concrete from the Approved Materials List (AML) may be used.

Table 830-1
Structural Concrete Patching Material Requirements

Parameter	Test	Value
Minimum Compressive Strength	ASTM C39 or ASTM C109	2000 psi (min.) at 24 hrs 4000 psi (min.) at 7 days
Curing Shrinkage	ASTM C157	0.07% max. at 28 days
Curing Expansion	ASTM C157	0.03% max. at 1 day
Thermal Expansion	ASTM C531	5.0 x 10 ⁻⁶ in/in/°F (min.) at 28 days 9.0 x 10 ⁻⁶ in/in/°F (max.) at 28 days
Bond Strength by Slant Shear	ASTM C882	750 psi (min.) at 7 days

830.03 SUBMITTALS

Submit to the Bridge Engineer for review and acceptance. Allow as a minimum at least 14 calendar days for review. Resubmittals will require an additional 14 calendar day review period. This review process will continue until submittal acceptance.

830.03.1 Structural Concrete Patching

As a minimum, submit the following information for review:

830.03.1.1 For Pre-Package Mixed Cementitious Mortar:

1. Name and type of the proposed repair mortar material and associated Portland cement concrete;
2. Name and address of supplier and manufacturer of the repair mortar and associated bonding agent;
3. Product data sheets showing compliance in accordance with the latest approved materials sampling manual specifications. The engineer may require documentation from an approved independent testing authority to confirm the performance criteria stated on product data sheets;

830.03.1.2 For site mixed cementitious mortar, the following additional information is required:

1. Name, type, and manufacturer of the proposed cement;
2. Name, type, and supplier of the proposed aggregates;
3. Test sample for DOTD testing labs; and,

830.03.1.3 Detailed proposal of concrete removal, application, and curing techniques to be used;

830.03.1.4 Details for repairs of damaged deformed reinforcing steel. These details shall conform to section 806.

830.03.2 Span Movement

Prior to beginning work, submit to the Bridge Engineer for review a span movement plan designed, sealed, signed and dated by a Professional Engineer registered in the State of Louisiana which addresses all structural, environmental and traffic management goals and commitments of the contract.

830.03.3 Structure Jacking

Prior to beginning work, submit to the Bridge Engineer for review a structure jacking plan designed, sealed, signed and dated by a Professional Engineer registered in the State of Louisiana. Provide as a minimum the following information:

1. Design of the structure jacking system
2. Equipment
3. Loads and capacities
4. Sequence of operations
5. Shoring and bracing
6. Traffic management goals and commitments

830.03.4 Bolt-Rivet Replacement (Structural Steel)

Submit to the engineer for review a fastener removal plan demonstrating that the proposed sequence and method of removal is a safe method and will not damage or adversely affect the structural members involved.

830.04 CONSTRUCTION REQUIREMENTS

Construction requirements will be specific to the structural repair and rehabilitation work specified.

830.04.1 Structural Concrete Patching

Repair designated areas shown on the plans. Remove loose or defective concrete. Saw cut and/or chip a perpendicular or back-tapered face along the periphery of the repair area so that the minimum depth of repair is approximately 1/2-inch to prevent feathered edges. Sandblast and remove all loose particles, dirt, deteriorated concrete or other substances from the repair area that could impair the bond between the existing concrete and reinforcing steel to remain and repair material. Maintain all reinforcing steel at its original position and clean exposed steel to meet SSPC-SP3 or SSPC-SP6 prior to placement of repair material. Replace damaged or corroded reinforcing steel with bars and splices of equal or greater capacity and as directed. Add reinforcing steel as specified in the plans.

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Repair and Rehabilitation

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Apply a bonding agent to the entire repair area including the reinforcing steel prior to placement of the patch material. Mix, apply and cure materials all in accordance with the manufacturer's recommendations.

Remove forms as directed by the engineer. Do not allow mortar or concrete to freeze during placement or curing. Sound completed repairs to locate any defective areas. Remove and repair defective areas at no additional cost or time to the Department. Finish patched areas in accordance with the plans and 805.13.

Temporary shoring is required for structure members that have insufficient load carrying capacity during the patching process. Orientation of repair area may affect material and construction requirements.

Maintain materials in original sealed containers until the time of use and store in accordance with the manufacturer's recommendations.

Materials shall be accompanied by a certificate of manufacture. Materials stored beyond the manufacturer's recommended shelf life shall not be used and will be rejected.

830.04.2 Span Movement

Span movement may involve transportation of a span to or from a staging area, jacking and sliding a span from one location to another, lifting a span from one location to another, etc. as specified.

Provide all equipment, temporary works, staging areas for span construction, jacking, lifting, movement of a superstructure span or unit using mechanized methods, placement of the span or unit, and the restoration of the staging areas to their original condition. All work shall be in accordance with the contract.

830.04.3 Structure Jacking

Structure jacking is the raising and lowering of structures as specified.

Jack the structure in accordance with the Contract and as directed by the engineer. Do not damage the structure. Temporary bracing and shoring may be required to prevent damage to the structure and to temporarily support structure loads. If used, bracing and shoring shall be designed, sealed, signed and dated by a Professional Engineer, registered in the State of Louisiana.

Damage is defined as any change in the structure which permanently decreases the capacity and/or reduces the life span of the structure or any of its components. Whether or not jacking has caused damage will be determined by the engineer and repairs shall be made to the satisfaction of the engineer at no additional cost or time to the Department.

830.04.4 Epoxy Injection

Repair cracks in concrete using an epoxy injection system in accordance with the contract, the manufacturer's recommendations, and as directed by the engineer.

830.04.5 Bolt-Rivet Replacement (Structural Steel)

Remove existing fasteners identified in the Contract and replace with new high strength fastener assemblies conforming to Section 807.21. Do not damage any structural steel to remain during fastener removal. Unless specified otherwise, remove fasteners by mechanical means only. Removal by torching is not allowed. Unless specified otherwise, all removed fasteners and any coating material will become the property of the contractor and disposed of in accordance with Section 202. Comply with Section 811 for removal of the existing coatings.

Any damaged structural steel resulting from fastener removal shall be repaired or replaced to the satisfaction of the engineer at no cost or time to the Department.

Unless specified otherwise, all fastener holes shall be reamed up to a circular hole having a diameter 1/16-inch larger than the nominal size of the replacement fastener. Grind fastener assembly contact areas flat and smooth. Clean fastener assembly contact area to SSPC SP-11 and apply one coat of cold galvanizing repair compound from the AML prior to fastener assembly installation.

Testing, installation and inspection of bolts, nuts, washers and DTI devices shall be in accordance with the contract and Section 807.

830.05 MEASUREMENT

830.05.1 Bridge Superstructure / Substructure Repair

Bridge Superstructure/Substructure Repair will be measured for payment per each contiguous repair as defined in the Contract.

830.05.2 Tunnel Repair

Tunnel Repair will be measured for payment per each contiguous repair, per square foot of repair area, or per lump sum as defined in the contract.

830.05.3 Girder Strengthening

Girder strengthening will be measured per each girder strengthened.

830.05.4 Span Movement

Span movement will be measured per each move specified in the plans.

830.05.5 Structure Jacking

Structure jacking will be measured on a lump sum basis.

830.05.6 Epoxy Injection

Epoxy injection will be measured per linear foot repaired.

830.05.7 Bolt – Rivet Replacement

This item, completed and accepted, will be measured for payment per each fastener replacement, and will include all materials, coatings, testing, labor, equipment, fastener removal plan, tools, and the performance of all work necessary to remove and dispose of the existing coatings and fasteners, and furnish, install, inspect and test high strength bolts, nuts, washers and DTI devices.

830.05.8 Structural Concrete Patching

Structural Concrete Patching will be measured by the square foot of patched material placed. When a repair involves multiple surfaces, such as a corner, measurement will be made on all surfaces repaired.

Measurement will include concrete removal, repair and replacement of reinforcing steel, placement of specified additional reinforcing steel, surface preparation, placement of repair materials, and all work required to complete the item in accordance with the contract. When the contract requires concrete removal by hydro-blasting or milling, the concrete removal will be measured and paid for under a separate removal item.

830.06 PAYMENT

Payment will be made at the contract unit price and will include all labor, equipment, materials, and incidentals required to complete the work.

Payment will be made under:

<u>Item No.</u>	<u>Pay Item</u>	<u>Pay Unit</u>
830-01-00100	Bridge Superstructure Repair	Each
830-02-00100	Bridge Substructure Repair	Each
830-03-00100	Tunnel Repair	Each
830-04-00100	Tunnel Repair	Square Foot
830-05-00100	Tunnel Repair	Lump Sum
830-06-00100	Girder Strengthening (Type)	Each
830-07-00100	Structural Concrete Patching	Square Foot
830-08-00100	Span Movement	Each
830-09-00100	Structure Jacking	Lump Sum
830-10-00100	Epoxy Injection	Linear Foot
830-11-00100	Bolt-Rivet Replacement (Structural Steel)	Each

STATE PROJECT NO. H.011425
TECHNICAL SPECIAL PROVISIONS

NS-MNT-51001: This item consists of furnishing all labor, equipment, hardware and incidentals necessary to install the salvaged (DOTD furnished) walers on the NE fender along with the contractor removed walers on the NW fender as shown in the plans (Plan Sheets 105-106). Hardware and installation shall be as shown in the reference drawings for S.P. 382-04-0044 (Plan Sheets 438-451). The contractor shall coordinate with the project engineer to pick up the DOTD furnished walers at 5827 Hwy. 90 E., Lake Charles, LA 70615. This item shall also include removal, as necessary, and reinstallation of the steel handrail on the NW fender.

Payment will be at the contract unit price under the following:

Item No.	Pay Item	Pay Unit
NS-MNT-51001	INSTALLATION OF WALERS (DOTD FURNISHED)	Linear Foot

**STATE OF LOUISIANA
DEPARTMENT OF TRANSPORTATION AND
DEVELOPMENT**



**CONSTRUCTION PROPOSAL
INFORMATION
FOR**

**STATE PROJECT NO. H.011425
BLACK BAYOU PONTOON BR COLLISION REPAIRS
ROUTE LA 384
CALCASIEU PARISH**

BID BOND

A Bid Bond is required when the bidder's total bid amount as calculated by the Department in accordance with Subsection 103.01 is greater than \$50,000. *(See Section 102 of the Project Specifications.)*

_____, as Principal
(Bidder) and _____, as Surety,
are bound unto the State of Louisiana, Department of Transportation and Development, (hereinafter called the Department) in the sum of five percent (5%) of the bidder's total bid amount as calculated by the Department for payment, of which the Principal and Surety bind themselves, their heirs, executors, administrators, successors and assigns, as solidary obligors.

Signed and sealed this _____ day of _____, 20_____.

The condition of this obligation is such that, whereas the Principal has submitted a bid to the Department on a contract for the construction of **STATE PROJECT NO. H.011425, BLACK BAYOU PONTOON BR COLLISION REPAIRS, located in CALCASIEU PARISH, ROUTE LA 384**, if the bid is accepted and the Principal, within the specified time, enters into the contract in writing and gives bond with Surety acceptable to the Department for payment and performance of said contract, this obligation shall be void; otherwise to remain in effect.

_____ Principal (Bidder or First Partner to Joint Venture) By _____ Authorized Officer-Owner-Partner _____ Typed or Printed Name	_____ If a Joint Venture, Second Partner By _____ Authorized Officer-Owner-Partner _____ Typed or Printed Name
_____ Surety By _____ (Seal) Agent or Attorney-in-Fact _____ Typed or Printed Name	

To receive a copy of the contract and subsequent correspondence / communication from LA DOTD, with respect to the bid bonds, the following information must be provided:

_____ Bonding Agency or Company Name	_____ Address
_____ Agent or Representative	_____ Phone Number / Fax Number



Proposal Schedule of Items

Proposal ID: H.011425.6

Project(s): H.011425.6

SECTION: 1 General Items

Proposal Line Number	Item ID	Description Unit Price (In Words, Ink or Typed)	Approximate Quantity	Unit of Measure
0001	202-01-00100	Removal of Structures and Obstructions		LUMP SUM
				Dollars
				Cents
0002	202-02-00010	Removal of Bumper Pile Cluster	1.000	EACH
				Dollars
				Cents
0003	202-02-00010	Removal of Sheave Platform	1.000	EACH
				Dollars
				Cents
0004	202-02-12300	Removal of Fender System NE Fender	1.000	EACH
				Dollars
				Cents
0005	202-02-12300	Removal of Fender System NW Fender	1.000	EACH
				Dollars
				Cents
0006	713-01-00100	Temporary Signs and Barricades		LUMP SUM
				Dollars
				Cents
0007	727-01-00100	Mobilization		LUMP SUM
				Dollars
				Cents



Proposal Schedule of Items

Proposal ID: H.011425.6

Project(s): H.011425.6

SECTION: 1 General Items

Proposal Line Number	Item ID	Description Unit Price (In Words, Ink or Typed)	Approximate Quantity	Unit of Measure
0008	730-09-00100	Electrical System		LUMP SUM
				Dollars
				Cents
0009	740-01-00100	Construction Layout		LUMP SUM
				Dollars
				Cents
0010	804-02-00200	Treated Timber Piles (Coastal Treatment)	1,210.000	LNFT
				Dollars
				Cents
0011	804-03-01060	Steel Piles (HP 12x53)	670.000	LNFT
				Dollars
				Cents
0012	807-08-00100	Structural Metalwork Bumper Pile Cluster		LUMP SUM
				Dollars
				Cents
0013	807-08-00100	Structural Metalwork Sheave Platform		LUMP SUM
				Dollars
				Cents
0014	807-08-00100	Structural Metalwork Tower Repairs		LUMP SUM
				Dollars
				Cents



Proposal Schedule of Items

Proposal ID: H.011425.6

Project(s): H.011425.6

SECTION: 1 General Items

Proposal Line Number	Item ID	Description Unit Price (In Words, Ink or Typed)	Approximate Quantity	Unit of Measure
0015	809-01-00100	Movable Bridge Machinery		LUMP SUM
				_____ Dollars
				_____ Cents
0016	812-01-00200	Treated Timber (Coastal Treatment)	0.490	MFBM
				_____ Dollars
				_____ Cents
0017	830-10-00100	Epoxy Injection	8.000	LNFT
				_____ Dollars
				_____ Cents
0018	NS-713-00008	Portable Changeable Message Sign	2.000	EACH
				_____ Dollars
				_____ Cents
0019	NS-MNT-51001	Installation of walers (DOTD Furnished)	384.000	LNFT
				_____ Dollars
				_____ Cents
Section: 1			Total:	_____
			Total Bid:	_____

CONSTRUCTION PROPOSAL SIGNATURE AND EXECUTION FORM

THIS FORM, THE SCHEDULE OF ITEMS, AND THE PROPOSAL GUARANTY MUST BE COMPLETED AS INDICATED AND SUBMITTED TO THE LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT (DOTD) TO CONSTITUTE A VALID BID

STATE PROJECT NO. H.011425

FEDERAL AID PROJECT NO. N/A

NAME OF PROJECT BLACK BAYOU PONTOON BR COLLISION REPAIRS

I (WE) HEREBY CERTIFY THAT I (WE) HAVE CAREFULLY EXAMINED THE PROPOSAL, PLANS AND SPECIFICATIONS, INCLUDING ANY AND ALL ADDENDA, AND THE SITE OF THE ABOVE PROJECT AND AM (ARE) FULLY COGNIZANT OF ALL PROPOSAL DOCUMENTS, THE MASTER COPY OF WHICH IS ON FILE AT DOTD HEADQUARTERS IN BATON ROUGE, LA., AND ALL WORK, MATERIALS AND LABOR REQUIRED THEREIN, AND AGREE TO PERFORM ALL WORK, AND SUPPLY ALL NECESSARY MATERIALS AND LABOR REQUIRED FOR SUCCESSFUL AND TIMELY COMPLETION OF THE ABOVE PROJECT AND TO ACCEPT THE SUMMATION OF THE PRODUCTS OF THE UNIT PRICES BID ON THE SCHEDULE OF ITEMS ATTACHED HERETO AND MADE A PART HEREOF MULTIPLIED BY THE ACTUAL QUANTITY OF UNIT OF MEASURE PERFORMED FOR EACH ITEM, AS AUDITED BY DOTD, AS FULL AND FINAL PAYMENT FOR ALL WORK, LABOR AND MATERIALS NECESSARY TO COMPLETE THE ABOVE PROJECT, SUBJECT TO INCREASE ONLY FOR PLAN CHANGES (CHANGE ORDERS) APPROVED BY THE DOTD CHIEF ENGINEER OR HIS DESIGNEE. THIS BID IS SUBMITTED IN ACCORDANCE WITH THE GENERAL BIDDING REQUIREMENTS IN THE CONSTRUCTION PROPOSAL AND ALL SPECIAL PROVISIONS, PLANS, SUPPLEMENTAL SPECIFICATIONS, AND THE LOUISIANA STANDARD SPECIFICATIONS FOR ROADS AND BRIDGES (2006 EDITION). I (WE) UNDERSTAND THAT THE SUMMATION OF THE PRODUCTS OF THE UNIT PRICES BID ON THE SCHEDULE OF ITEMS MULTIPLIED BY THE ESTIMATED QUANTITY OF UNIT OF MEASURE FOR EACH ITEM, ALONG WITH ANY OTHER FACTORS SPECIFIED TO BE APPLICABLE SUCH AS CONSTRUCTION TIME AND/OR LANE RENTAL, SHALL BE THE BASIS FOR THE COMPARISON OF BIDS. I (WE) UNDERSTAND THAT THE SCHEDULE OF ITEMS MUST CONTAIN UNIT PRICES WRITTEN OUT IN WORDS AND THAT THE SCHEDULE OF ITEMS SUBMITTED AS PART OF THIS BID IS ON THE FORM SUPPLIED BY DOTD IN THE BID PROPOSAL. MY (OUR) PROPOSAL GUARANTY IN THE AMOUNT SPECIFIED FOR THE PROJECT IS ATTACHED HERETO AS EVIDENCE OF MY (OUR) GOOD FAITH TO BE FORFEITED IF THIS BID IS ACCEPTED BY DOTD AND I (WE) FAIL TO COMPLY WITH ANY REQUIREMENT NECESSARY FOR AWARD AND EXECUTION OF THE CONTRACT, AS WELL AS, SIGN AND DELIVER THE CONTRACT AND PAYMENT/PERFORMANCE/RETAINAGE BOND AS REQUIRED IN THE SPECIFICATIONS.

NONCOLLUSION DECLARATION (APPLICABLE TO FEDERAL-AID PROJECTS)

I (WE) DECLARE UNDER PENALTY OF PERJURY UNDER THE LAWS OF THE UNITED STATES AND THE STATE OF LOUISIANA THAT I (WE) HAVE NOT DIRECTLY OR INDIRECTLY, ENTERED INTO ANY AGREEMENT, PARTICIPATED IN ANY COLLUSION, OR OTHERWISE TAKEN ANY ACTION IN RESTRAINT OF FREE COMPETITIVE BIDDING IN CONNECTION WITH THE CONTRACT FOR THIS PROJECT NOR VIOLATED LA. R.S. 48:254.

BIDDER'S DBE GOAL STATEMENT (APPLICABLE TO DBE GOAL PROJECTS)

IF THIS PROJECT IS DESIGNATED BY SPECIAL PROVISION AS A DISADVANTAGED BUSINESS ENTERPRISE (DBE) GOAL PROJECT IN ACCORDANCE WITH THE DBE PROVISIONS OF THIS CONTRACT, THE BIDDER ASSURES DOTD THAT HE/SHE WILL MEET OR EXCEED THE DBE CONTRACT GOAL, OR IF THE BIDDER CANNOT MEET THE REQUIRED DBE GOAL, THE BIDDER ASSURES DOTD THAT HE/SHE HAS MADE AND CAN DOCUMENT GOOD FAITH EFFORTS MADE TOWARDS MEETING THE GOAL REQUIREMENT IN ACCORDANCE WITH THE CONTRACT AND DBE PROGRAM MANUAL INCORPORATED HEREIN BY REFERENCE.

THE APPARENT LOW BIDDER SHALL COMPLETE AND SUBMIT TO THE DOTD COMPLIANCE PROGRAMS OFFICE, FORM CS-6AAA AND ATTACHMENT(S) AND, IF NECESSARY, DOCUMENTATION OF GOOD FAITH EFFORTS MADE BY THE BIDDER TOWARD MEETING THE GOAL, WITHIN SEVEN CALENDAR DAYS AFTER THE OPENING OF BIDS FOR THIS PROJECT. RESPONSIVENESS OF INFORMATION SUPPLIED IN THIS SECTION OF THIS CONSTRUCTION PROPOSAL SIGNATURE AND EXECUTION FORM IS GOVERNED BY THE DBE REQUIREMENTS INCLUDED WITHIN THE SPECIFICATIONS AND DBE PROGRAM MANUAL.

CERTIFICATION OF EMPLOYMENT OF LOUISIANA RESIDENTS TRANSPORTATION INFRASTRUCTURE MODEL FOR ECONOMIC DEVELOPMENT (TIME) PROJECTS (APPLICABLE TO TIME PROJECTS)

IF THIS PROJECT IS DESIGNATED BY SPECIAL PROVISION AS A TRANSPORTATION INFRASTRUCTURE MODEL FOR ECONOMIC DEVELOPMENT (TIME) PROJECT AS DEFINED IN ACT NO. 16 OF THE 1989 FIRST EXTRAORDINARY SESSION OF THE LEGISLATURE WHICH ENACTED PART V OF CHAPTER 7 OF SUBTITLE II OF TITLE 47 OF THE LOUISIANA REVISED STATUTES OF 1950, COMPRISED OF R.S. 47:820.1 THROUGH 820.6.

THE BIDDER CERTIFIES THAT AT LEAST 80 PERCENT OF THE EMPLOYEES EMPLOYED ON THIS TIME PROJECT WILL BE LOUISIANA RESIDENTS IN ACCORDANCE WITH LOUISIANA R.S. 47:820.3.

NON PARTICIPATION IN PAYMENT ADJUSTMENT (ASPHALT CEMENT AND FUELS) STATEMENT

IF THIS PROJECT IS DESIGNATED BY SPECIAL PROVISION AS BEING SUBJECT TO PAYMENT ADJUSTMENT FOR ASPHALT CEMENT AND/OR FUELS, THE BIDDER HAS THE OPTION OF REQUESTING EXCLUSION FROM SAID PAYMENT ADJUSTMENT PROVISIONS THAT ARE ESTABLISHED BY SPECIAL PROVISION ELSEWHERE HEREIN.

IF THE BIDDER DESIRES TO BE EXCLUDED FROM THESE PAYMENT ADJUSTMENT PROVISIONS,

THE BIDDER IS REQUIRED TO MARK HERE

FAILURE TO MARK THIS BOX PRIOR TO BID OPENING WILL CONSTITUTE FORFEITURE OF THE BIDDER'S OPTION TO REQUEST EXCLUSION.

CS-14A
04/15

BIDDER SIGNATURE REQUIREMENTS (APPLICABLE TO ALL PROJECTS)

THIS BID FOR THE CAPTIONED PROJECT IS SUBMITTED BY:

(Name of Principal (Individual, Firm, Corporation, or Joint Venture))

(If Joint Venture, Name of First Partner)

(Louisiana Contractor's License Number of Bidder or First Partner to Joint Venture)

(Business Street Address)

(Business Mailing Address, if different)

(Area Code and Telephone Number of Business)

(Telephone Number and Name of Contact Person)

(Telecopier Number, if any)

(If Joint Venture, Name of Second Partner)

(Louisiana Contractor's License Number of Second Partner to Joint Venture)

(Business Street Address)

(Business Mailing Address, if different)

(Area Code and Telephone Number of Business)

(Telephone Number and Name of Contact Person)

(Telecopier Number, if any)

ACTING ON BEHALF OF THE BIDDER, THIS IS TO ATTEST THAT THE UNDERSIGNED DULY AUTHORIZED REPRESENTATIVE OF THE ABOVE CAPTIONED FIRM, CORPORATION OR BUSINESS, BY SUBMISSION OF THIS BID, AGREES AND CERTIFIES THE TRUTH AND ACCURACY OF ALL PROVISIONS OF THIS PROPOSAL, INCLUSIVE OF THE REQUIREMENTS, STATEMENTS, DECLARATIONS AND CERTIFICATIONS ABOVE AND IN THE SCHEDULE OF ITEMS AND PROPOSAL GUARANTY. EXECUTION AND SIGNATURE OF THIS FORM AND SUBMISSION OF THE SCHEDULE OF ITEMS AND PROPOSAL GUARANTY SHALL CONSTITUTE AN IRREVOCABLE AND LEGALLY BINDING OFFER BY THE BIDDER.

(Signature)

(Printed Name)

(Title)

(Date of Signature)

(Signature)

(Printed Name)

(Title)

(Date of Signature)

CONTRACTOR'S TOTAL BASE BID \$ _____

IT IS AGREED THAT THIS TOTAL, DETERMINED BY THE BIDDER, IS FOR PURPOSES OF OPENING AND READING BIDS ONLY, AND THAT THE LOW BID FOR THIS PROJECT WILL BE DETERMINED FROM THE EXTENSION AND TOTAL OF THE BID ITEMS BY DOTD.

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