MISSOURI
HIGHWAYS and TRANSPORTATION COMMISSION

JEFFERSON CITY, MISSOURI

GENERAL PROVISIONS AND
SUPPLEMENTAL SPECIFICATIONS TO 2016
MISSOURI STANDARD SPECIFICATIONS FOR
HIGHWAY CONSTRUCTION

Effective April 1, 2017

CONTENTS

GENERAL PROVISIONS

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SECTION 404 NATIONWIDE PERMIT GENERAL CONDITIONS

04/17

General Conditions. The following general conditions shall be followed in order for authorization by a Nationwide Permit (NWP) to be valid. Permit authorization from U.S. Army Corps of Engineers (USACE) may have additional conditions that will be binding to the project. The contractor shall refer to the permit authorization letter included in the contract.

1.0 Navigation. No activity shall cause more than a minimal adverse effect on navigation.

2.0 Aquatic Life Movements. No activity shall substantially disrupt the necessary life-cycle movements of those species of aquatic life indigenous to the waterbody, including those species that normally migrate through the area, unless the activity's primary purpose is to impound water. All permanent and temporary crossings of waterbodies shall be suitably culverted, bridged, or otherwise designed and constructed to maintain low flows to sustain the movement of those aquatic species. If a bottomless culvert cannot be used, then the crossing should be designed and constructed to minimize adverse effects to aquatic life movements.

3.0 Spawning Areas. Activities in spawning areas during spawning seasons must be avoided to the maximum extent practical. Activities that result in the physical destruction (e.g., through excavation, fill or downstream smothering by substantial turbidity) of an important spawning area are not authorized.

4.0 Migratory Bird Breeding Areas. Activities in waters of the United States that serve as breeding areas for migratory birds must be avoided to the maximum extent practicable.

5.0 Suitable Material. No activity may use unsuitable material (e.g., trash, debris, car bodies, asphalt, etc.) Material used for construction or discharged must be free from toxic pollutants in toxic amounts (see Section 307 of the Clean Water Act).

6.0 Water Supply Intakes. No activity may occur in the proximity of a public water supply intake, except where the activity is for the repair or improvement of public water supply intake structures or adjacent bank stabilization.

7.0 Adverse Effects from Impoundments. If the activity creates an impoundment of water, adverse effects to the aquatic system due to accelerating the passage of water, and/or restricting its flow must be minimized to the maximum extent practicable.

8.0 Management of Water Flows. To the maximum extent practicable, the pre-construction course, condition, capacity and location of open waters must be maintained for each activity, including stream channelization, storm water management activities, and temporary and permanent road crossings, except as provided below. The activity must be constructed to withstand expected high flows. The activity must not restrict or impede the passage of normal or high flows, unless the primary purpose of the activity is to impound water or manage high flows. The activity may alter the preconstruction course, condition, capacity, and location of open waters if it benefits the aquatic environment (e.g., stream restoration or relocation activities).

9.0 Fills Within 100-Year Floodplains. The activity must comply with applicable FEMA-approved state or local floodplain management requirements.

10.0 Equipment. Heavy equipment working in wetlands or mudflats must be placed on mats, or other measures shall be taken to minimize soil disturbance.

11.0 Soil Erosion and Sediment Controls. Appropriate erosion and sediment controls must be used and maintained in effective operating condition during construction, and all exposed soil and other fills, as well as any work below the ordinary high water mark or high tide line, must be permanently stabilized at the earliest practicable date. Permittees are encouraged to perform work within waters of the US during periods of low-flow or no-flow.

12.0 Removal of Temporary Fills. Temporary fills must be completely removed in their entirety and the affected areas returned to the pre-construction elevations. The affected areas must be revegetated, as appropriate.

13.0 Wild and Scenic Rivers. No activity may occur in a component of the National Wild and Scenic River System; or in a river officially designated by Congress as a "study river" for possible inclusion in the system while the river is in an official study status, unless the appropriate Federal agency, with direct management responsibility for such river, has determined in writing that the proposed activity will not adversely affect the Wild and Scenic River designation, or study status.

14.0 Tribal Rights. No NWP activity may cause more than minimal adverse effects on tribal rights (including treaty rights), protected tribal resources, or tribal lands.

15.0 Endangered Species No activity is authorized under any NWP which is likely to directly or indirectly jeopardize the continued existence of a threatened or endangered species or a species proposed for such designation, as identified under the Federal Endangered Species Act, or which will directly or indirectly destroy or adversely modify the critical habitat of such species. No activity is authorized under any NWP which ''may affect'' a listed species or critical habitat, unless ESA section 7 consultation addressing the effects of the proposed activity has been completed. Direct effects are the immediate effects on listed species and critical habitat caused by the NWP activity. Indirect effects are those effects on listed species and critical habitat that are caused by the NWP activity and are later in time, but still are reasonably certain to occur. In cases where the non-Federal applicant has identified listed species or critical habitat that might be affected or is in the vicinity of the activity, and has so notified the Corps, the applicant shall not begin work until the Corps has provided notification that the proposed activity will have ''no effect'' on listed species or critical habitat, or until ESA section 7 consultation has been completed.

16.0 Migratory Birds and Bald and Golden Eagles. The permittee is responsible for ensuring their action complies with the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act. The permittee is responsible for contacting appropriate local office of the U.S. Fish and Wildlife Service to determine applicable measures to reduce impacts to migratory birds or eagles, including whether ''incidental take'' permits are necessary and available under the Migratory Bird Treaty Act or Bald and Golden Eagle Protection Act for a particular activity.

17.0 Historic Properties. In cases where the USACE District Engineer determines that the activity may have the potential to cause effects to properties listed, or eligible for listing, in the National Register of Historic Places, the activity is not authorized, until the requirements of Section 106 of the National Historic Preservation Act (NHPA) have been satisfied.

18.0 Mitigation. The project must be designed and constructed to avoid and minimize adverse effects, both temporary and permanent, to waters of the U.S. to the maximum extent practicable at the project site (i.e., on site).

19.0 Regional and Case-by-Case Conditions. The contractor's activity shall comply with any regional conditions that may have been added to the contract by the USACE Division Engineer, (see 33 CFR 330.4(e)), and with any case-specific conditions added by the Corps or by the state, Indian Tribe, or U.S. EPA in its Section 401 water quality certifications.

20.0 Activities Affecting Structures or Works Built by the United States. If an NWP activity also requires permission from the Corps pursuant to 33 U.S.C. 408 because it will alter or temporarily or permanently occupy or use a USACE federally authorized Civil Works project (a ''USACE project''), the prospective permittee must submit a preconstruction notification. See paragraph (b)(10) of general condition 32. An activity that requires Section 408 Permission is not authorized by NWP until the appropriate Corps office issues the section 408 permission to alter, occupy, or use the USACE project, and the USACE District Engineer issues a written NWP verification.

21.0 Section 404 Conditions. In addition to the General Conditions, the following conditions will apply only to activities that involve the discharge of dredged or fill material into waters of the US, and shall be followed to maintain compliance with the NWP authorization.

21.1 Section 404 Nationwide Permit No. 3.

21.1.1 The repair, rehabilitation, or replacement of any previously authorized, currently serviceable, structure or fill, or of any currently serviceable structure or fill authorized by 33 CFR 330.3, provided that the structure or fill is not to be put to uses differing from those uses specified or contemplated for the fill in the original permit or the most recently authorized modification. Minor deviations in the structure's configuration or filled area, including those due to changes in material, construction techniques, requirements of other regulatory agencies, or current construction codes or safety standards that are necessary to make the repair, rehabilitation, or replacement are authorized. This NWP also authorizes the removal of previously authorized structures or fills. Any stream channel modification is limited to the minimum necessary for the repair, rehabilitation, or replacement of the structure or fill; such modifications, including the removal of material from the stream channel, must be immediately adjacent to the project. This NWP also authorizes the removal of accumulated sediment and debris within, and in the immediate vicinity of, the structure or fill. This NWP also authorizes the repair, rehabilitation, or replacement of those structures or fills destroyed or damaged by storms, floods, fire or other discrete events, provided the repair, rehabilitation, or replacement is commenced, or is under contract to commence, within two years of the date of their destruction or damage. In cases of catastrophic events, such as hurricanes or tornadoes, this two-year limit may be waived by the district engineer, provided the permittee can demonstrate funding, contract, or other similar delays.

21.1.2 This NWP also authorizes the removal of accumulated sediments and debris outside the immediate vicinity of existing structures (e.g., bridges, culverts road crossings, water intake structures, etc.). The removal of sediment is limited to the minimum necessary to restore the waterway in the vicinity of the structure to the approximate dimensions that existed when the structure was built, but cannot extend farther than 200 feet in any direction from the structure. This 200 foot limit does not apply to maintenance dredging to remove accumulated sediments blocking or restricting outfall and intake structures or to maintenance

dredging to remove accumulated sediments from canals associated with outfall and intake structures. All dredged or excavated materials must be deposited and retained in an area that has no waters of the United States unless otherwise specifically approved by the district engineer under separate authorization.

21.1.3 This NWP also authorizes temporary structures, fills, and work, including the use of temporary mats, necessary to conduct the maintenance activity. Appropriate measures must be taken to maintain normal downstream flows and minimize flooding to the maximum extent practicable, when temporary structures, work, and discharges, including cofferdams, are necessary for construction activities, access fills, or dewatering of construction sites. Temporary fills must consist of materials, and be placed in a manner, that will not be eroded by expected high flows. After conducting the maintenance activity, temporary fills must be removed in their entirety and the affected areas returned to preconstruction elevations. The areas affected by temporary fills must be revegetated, as appropriate.

21.2 Section 404 Nationwide Permit No. 12. Activities required for the construction, maintenance and repair of utility lines and associated facilities in waters of the U.S. shall be as follows.

21.2.1 Utility lines. This NWP authorizes discharges of dredged or fill material into waters of the United States and structures or work in navigable waters for crossings of those waters associated with the construction, maintenance, or repair of utility lines, including outfall and intake structures. There must be no change in pre-construction contours of waters of the United States. A ''utility line'' is defined as any pipe or pipeline for the transportation of any gaseous, liquid, liquescent, or slurry substance, for any purpose, and any cable, line, or wire for the transmission for any purpose of electrical energy, telephone, and telegraph messages, and internet, radio and television communication. The term ''utility line'' does not include activities that drain a water of the United States, such as drainage tile or french drains, but it does apply to pipes conveying drainage from another area. Material resulting from trench excavation may be temporarily sidecast into waters of the U.S. for no more than three months, provided that the material is not placed in such a manner that it is dispersed by currents or other forces. The USACE District Engineer may extend the period of temporary side casting for no more than a total of 180 days, where appropriate. In wetlands, the top 6 to 12 inches of the trench should normally be backfilled with topsoil from the trench. The trench cannot be constructed or backfilled in such a manner as to drain waters of the U.S. (e.g., backfilling with extensive gravel layers, creating a french drain effect). Any exposed slopes and stream banks shall be stabilized immediately upon completion of the utility line crossing of each waterbody.

21.2.2 Utility line substations. This NWP authorizes the construction, maintenance, or expansion of substation facilities associated with a power line or utility line in non-tidal waters of the United States, provided the activity, in combination with all other activities included in one single and complete project, does not result in the loss of greater than 1/2-acre of waters of the United States.

21.2.3 Foundations for Overhead Utility Line Towers, Poles, and Anchors. This NWP authorizes the construction or maintenance of foundations for overhead utility line towers, poles, and anchors in all waters of the U.S., provided the foundations are the minimum size necessary and separate footings for each tower leg (rather than a larger single pad) are used where feasible.

21.2.4 Access Roads. This NWP authorizes the construction of access roads for the construction and maintenance of utility lines, including overhead power lines and utility line substations, in non-tidal waters of the US, provided the activity, in combination with all other activities included in one single and complete project, does not cause the loss of greater than 1/2 acre of non-tidal waters of the U.S. Access roads shall be the minimum width necessary. Access roads must be constructed so that the length of the road minimizes any adverse effects on waters of the US and must be as near as possible to preconstruction contours and elevations (e.g., at grade corduroy roads or geotextile/gravel roads). Access roads constructed above preconstruction contours and elevations in waters of the U.S. must be properly bridged or culverted to maintain surface flows. This NWP authorizes, to the extent that Department of the Army authorization is required, temporary structures, fills, and work necessary for the remediation of inadvertent returns of drilling fluids to waters of the United States through sub-soil fissures or fractures that might occur during horizontal directional drilling activities conducted for the purpose of installing or replacing utility lines. These remediation activities must be done as soon as practicable, to restore the affected waterbody. District engineers may add special conditions to this NWP to require a remediation plan for addressing inadvertent returns of drilling fluids to waters of the United States during horizontal directional drilling activities conducted for the purpose of installing or replacing utility lines. This NWP also authorizes temporary structures, fills, and work, including the use of temporary mats, necessary to conduct the utility line activity. Appropriate measures must be taken to maintain normal downstream flows and minimize flooding to the maximum extent practicable, when temporary structures, work, and discharges, including cofferdams, are necessary for construction activities, access fills, or dewatering of construction sites. Temporary fills must consist of materials, and be placed in a manner, that will not be eroded by expected high flows. After construction, temporary fills must be removed in their entirety and the affected areas returned to preconstruction elevations. The areas affected by temporary fills must be revegetated, as appropriate.

21.3 Section 404 Nationwide Permit No. 13. The following bank stabilization activities will be necessary for erosion prevention provided the activity meets all of the following criteria.

21.3.1 No material is placed in excess of the minimum needed for erosion protection.

21.3.2 The bank stabilization activity is no more than 500 feet in length.

21.3.3 The activity will not exceed an average of one cubic yard per running foot as measured along the length of the treated bank, below the plane of the ordinary high water mark or the high tide line, unless the district engineer waives this criterion by making a written determination concluding that the discharge will result in no more than minimal adverse environmental effects.

21.3.4 No material is placed in any special aquatic site, including wetlands. Special aquatic sites include wildlife sanctuaries and refuges, wetland, mudflats, vegetated shallow and riffle and pool complexes.

21.3.5 No material is of the type, or is placed in any location, or in any manner, to impair surface water flow into or out of any waters of the U.S.

21.3.6 No material is placed in a manner that will be eroded by normal or expected high flows (properly anchored trees and treetops may be used in low energy areas).

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21.3.7 Native plants appropriate for current site conditions, including salinity, must be used for bioengineering or vegetative bank stabilization.

21.3.8 This NWP shall not be used for the channelization of a water of the U.S.

21.4 Section 404 Nationwide Permit No. 14. Activities required for the construction, expansion, modification, or improvement of linear transportation projects (e.g., roads, highways, railways, trails, airport runways, and taxiways) in waters of the U.Sif the activity meets the following criteria.

21.4.1 The discharge does not cause the loss of greater than 1/2-acre of waters of the US.

21.4.2 . Any stream channel modification, including bank stabilization, is limited to the minimum necessary to construct or protect the linear transportation project; such modifications must be in the immediate vicinity of the project.

21.4.3 This NWP also authorizes temporary structures, fills, and work, including the use of temporary mats, necessary to construct the linear transportation project. Appropriate measures must be taken to maintain normal downstream flows and minimize flooding to the maximum extent practicable, when temporary structures, work, and discharges, including cofferdams, are necessary for construction activities, access fills, or dewatering of construction sites. Temporary fills must consist of materials, and be placed in a manner, that will not be eroded by expected high flows. Temporary fills must be removed in their entirety and the affected areas returned to preconstruction elevations. The areas affected by temporary fills must be revegetated, as appropriate.

21.5 Section 404 Nationwide Permit No. 15. Discharges of dredged or fill material incidental to the construction of bridges across navigable waters of the U.S., including cofferdams, abutments, foundation seals, piers, and temporary construction and access fills provided the construction of the bridge structure has been authorized by the U.S. Coast Guard under Section 9 of the Rivers and Harbors Act of 1899 or other applicable laws. Causeways and approach fills are not be included in this NWP and will require a separate Section 404 permit.

21.6 Section 404 Nationwide Permit No. 23. Activities undertaken, assisted, authorized, regulated, funded, or financed, in whole or in part, by another Federal agency or department where that agency or department has determined, pursuant to the Council on Environmental Quality's implementing regulations for the National Environmental Policy Act (40 CFR Part 1500 et seq.), that the activity is categorically excluded from the requirement to prepare an environmental impact statement or environmental assessment analysis, because it is included within a category of actions which neither individually nor cumulatively have a significant effect on the human environment, and the USACE Office of the Chief of Engineers (ATTN: CECW-OR) has concurred with that agency's or department's determination that the activity is categorically excluded and approved the activity for authorization under NWP23.

21.7 Section 404 Nationwide Permit No. 33. Temporary structures, work and discharges, including cofferdams, necessary for construction activities or access fills or dewatering of construction sites; provided that the associated primary activity is authorized by the USACE or the U.S. Coast Guard. This NWP also authorizes temporary structures, work, and discharges, including cofferdams, necessary for construction activities not otherwise subject to the Corps or U.S. Coast Guard permit requirements. Appropriate measures shall be taken to maintain near normal downstream flows and to minimize flooding. Fill must consist of materials, and placed in a manner that will not be eroded by expected high flows. The use of dredged material

may be allowed if the USACE District Engineer determines that it will not cause more than minimal adverse effects. Following completion of construction, temporary fill must be entirely removed to areas an area that has no waters of the U.S., dredged material must be returned to its original location, and the affected areas must be restored to pre-construction elevations. Cofferdams shall not be used to dewater wetlands or other aquatic areas changing the use of these areas. The affected areas must also be revegetated, as appropriate. This permit does not authorize the use of cofferdams to dewater wetlands or other aquatic areas to change their use. Structures left in place after cofferdams are removed will require a Section 10 permit if located in navigable waters of the U. S. (See 33 CFR, Part 322).

SECTION 401 WATER QUALITY CERTIFICATION CONDITIONS

04/17

1.0 Description. When a Clean Water Act Section 404 Nationwide Permit is in effect, the contractor is automatically permitted to perform this work under a Water Quality Certification (Section 401) by the Missouri Department of Natural Resources (MDNR). The contractor shall adhere to the following conditions:

1.1 Temporary stream crossings will be designed so that no drops or dams are created that impede the passage of aquatic life.

1.2 Stream channel modifications should be avoided as much as possible and, if needed, will be minimized. Where modifications are necessary for highway design safety or protection of state infrastructure, they will be designed using scientific guidelines, such as natural channel design.

1.3 The following materials will not be specified or used for bank stabilization: earthen fill, gravel, fragmented asphalt, broken concrete with exposed rebar, large slabs of unbroken concrete, tires, vehicle bodies, liquid concrete including grouted riprap, or any material containing chemical pollutants.

1.4 During construction, clearing of vegetation will be kept to the minimum necessary to accomplish the project.

1.5 Petroleum products, hazardous chemicals, hazardous wastes, equipment, construction material and solid waste will not be stored after construction working hours below the ordinary high water mark.

1.6 Equipment will not be operated in wetland or stream areas, except where permitted, expressed by the project plans or the engineer in writing. Petroleum products will not be stored in waters of the state.

1.7 Riparian areas and stream banks will be restored to a stable condition as soon as possible after final contouring.

1.8 Work done in streams shall be conducted during low flows whenever possible.

1.9 Petroleum products spilled into any water or in areas where material could enter a water will be cleaned up immediately and disposed of properly. Any such spills of petroleum shall be reported as soon as possible, but no later than 24 hours after discovery to the MDNR, Environmental Emergency Response number at (573) 634-2436.

DISADVANTAGED BUSINESS ENTERPRISE (DBE) PROGRAM REQUIREMENTS

1.0 Disadvantaged Business Enterprise (DBE) Program Requirements. The subsequent Sections will apply only to contracts involving U.S. Department of Transportation (USDOT) federal-aid or federal financial participation. Federal-aid or federal financial participation includes, but is not limited to, any funds directly or indirectly received by MoDOT, or authorized for distribution to or through MoDOT, by the USDOT or any operating administration within the USDOT. These provisions will not apply to Commission contracts funded exclusively with state funds, or state and local funds. Any contractor, subcontractor, supplier, DBE firm, and contract surety involved in the performance of a federal-aid contract shall be aware of and fully understand the terms and conditions of the USDOT DBE Program, as the terms appear in Title 49 CFR Part 26 (as amended), the USDOT DBE Program regulations; Title 7 CSR Division 10, Chapter 8 (as amended), the Commission's DBE Program rules.

2.0 DBE Program Distinguished From Other Affirmative Action Programs. The USDOT DBE Program established by the U.S. Congress is not the same as, and does not involve or utilize, any of the elements or authority of other state or local affirmative action programs, nor does the program rely upon state legislation or gubernatorial executive orders for

implementation or authorization, other than the general authority given the Commission in Section 226.150, RSMo. The USDOT DBE Program is implemented by the Commission and MoDOT, through and in conjunction with the FHWA, FTA and FAA, as a "recipient" defined in Title 49 CFR 26.5.

3.0 Policy Regarding DBE Firms. It is the policy of the U. S. Department of Transportation and MoDOT that businesses owned by socially and economically disadvantaged individuals have an opportunity to participate in the performance of contracts financed in whole or in part with federal funds. Consequently, the requirements of 49 CFR Part 26 (as amended) and the Commission's implementing state regulations in Title 7 CSR Division 10, Chapter 8, "Disadvantaged Business Enterprise Program", will apply to any contract with federal funds.

4.0 Opportunity for DBEs to Participate. Each contractor, subcontractor and supplier working on a contract financed in whole or in part with federal funds shall take all necessary and reasonable steps to ensure that DBEs have an opportunity to compete for, and participate in performance on project contracts and subcontracts.

5.0 Required Contract Provision. The federal-aid contract will include the following provision, as mandated by USDOT at Title 49 CFR 26.13(b):

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

In this provision, "contractor" will be defined as the contractor on the contract; "subrecipient" will be defined as any subcontractor performing the work. For the purposes of any federal-aid contract awarded by the Commission, "the recipient" will be defined as either the Commission, or MoDOT, or both. The contractor shall include this same contract provision in every supply contract or subcontract the contractor makes or executes with a subrecipient.

6.0 Bank Services. The contractor, and each subrecipient on a federal-aid contract, is encouraged to use the services of banks owned and controlled by socially and economically disadvantaged individuals. Such banking services, and the fees charged for services, typically will not be eligible for DBE Program contract goal credit. Any questions on this subject should be directed to the MoDOT External Civil Rights Division. See Sec 7.0.

7.0 DBE Program Information. DBE Program information may be obtained from the MoDOT External Civil Rights Division, 105 W. Capitol Avenue, P.O. Box 270, Jefferson City, Missouri 65102-0270. Phone (573) 751-7801, Fax (573) 526-0558, E-Mail: dbe@modot.mo.gov. It will be the duty of each contractor, for the contractor and for the contractor's subrecipients and surety, to take the steps necessary to determine the legal obligations and limitations under the DBE Program, as an element of responsibility. It will be the duty of each certified DBE firm to know, understand and comply with the DBE firm's legal obligations and limitations under the DBE Program, as a requirement of program participation. A surety providing a bid or contract bond will be bound by those bonds to the duties of the surety's principal.

8.0 DBE Certification, and the Missouri Unified Certification Program. The Missouri Department of Transportation and other certifying agencies within Missouri have partnered to form the Missouri Regional Certification Committee (MRCC) and developed a Unified Certification Program (UCP) pursuant to 49 CFR 26.81 and 7 CSR 10-8.061. Only DBE firms certified by the MRCC are eligible to perform work on a federal-aid contract for DBE contract goal credit. It is the contractor's responsibility to ensure firms identified for participation are approved certified DBE firms. The MRCC DBE Directory can be found at the following link:

http://www.modot.mo.gov/business/contractor_resources/External_Civil_Rights/DBE_program.htm

9.0 DBE Program-Related Certifications Made By Bidders and Contractors. If the bidder makes a written, express disclaimer of one or more certifications or assurances in the bid, the bid will be considered non-responsive. By submitting a bid on any call involving USDOT federal financial participation, and by entering into any contract on the basis of that bid, the contractor makes each of the following DBE Program-related certifications and assurances to USDOT, to the Commission, and to MoDOT:

(a) The bidder certifies that management and bidding officers have reviewed and understand the bidding and project construction and administration obligations of the USDOT DBE Program regulations at Title 49 CFR Part 26 (as amended), the USDOT DBE Program regulations; Title 7 CSR Division 10, Chapter 8 (as amended), and the Commission's DBE Program rules. The bidder further certifies that the contractors management personnel on the project understand and are familiar with the requirements of these federal and state DBE Program regulations; and if the bidder was not familiar with or did not understand the requirements of these regulations, they have contacted the External Civil Rights Division of MoDOT and have been informed as to their duties and obligations under the DBE Program regulations by MoDOT staff and/or by USDOT DBE Program staff.

(b) The bidder certifies that the bidder has complied with the federal and state DBE Program requirements in submitting the bid, and will comply fully with these requirements in performing any federal-aid contract awarded on the basis of that bid.

(c) The bidder agrees to ensure that certified DBE firms have a full and fair opportunity to participate in the performance of the contract financed in whole or in part with federal funds. The bidder certifies that all necessary and reasonable steps were taken to ensure that DBE firms have an opportunity to compete for, and perform work on the contract. The bidder further certifies that the bidder not discriminate on the basis of race, color, age, national origin or sex in the performance of the contract, or in the award of any subcontract.

(d) The bidder certifies, under penalty of perjury and other applicable penal laws that if awarded the federal-aid contract, the contractor will make a good faith effort to utilize certified DBE firms to perform DBE work at or above the amount or percentage of the dollar value specified in the bidding documents. The bidder further certifies the bidder's understanding that the bidder may not unilaterally terminate, substitute for, or replace any DBE firm that was designated in the executed contract, in whole or in any part, with another DBE, any non-DBE firm or with the contractor's own forces or those of an affiliate of the contractor, without the prior written consent of MoDOT as set out below.

(e) The bidder certifies, under penalty of perjury and other applicable penal laws that a good faith effort was made to obtain DBE participation in the contract, at or above the DBE participation contract goal. The bidder further certifies, under penalty of perjury and other applicable penal laws, that if the bidder is not able to meet the Commission's DBE contract goal, and if the bidder is not able to meet that DBE contract goal by the time the proposed DBE participation information must be submitted, within three business days after bid opening, the bidder has submitted with and as a part of the bid, a true, accurate, complete and detailed written explanation of good faith efforts to meet the DBE Contract Goal.

(f) The bidder understands and agrees that if awarded the contract the contractor is legally responsible to ensure that the contractor and each DBE subcontractor and supplier, comply fully with all regulatory and contractual requirements of the USDOT DBE Program, and that each DBE firm participating in the contract fully perform the designated tasks, with the DBE's own forces and equipment, under the DBE's own direct supervision and management. The bidder certifies, under penalty of perjury and other applicable penal laws, that if it awarded the contract and if MoDOT or the Commission determine that the contractor, a DBE or any other firm retained by the contractor has failed to comply with the DBE Program requirements or federal or state DBE Program regulations, the Commission, through MoDOT, shall have the sole authority and discretion to determine the extent of the monetary value to which the DBE contract goals have not been met, and to assess against and withhold monetary damages from the contractor in the full amount of that breach. The Commission, through MoDOT, may impose any other remedies available at law or provided in the contract in the event of a contract breach. The bidder further understands and agrees that this clause authorizes the Commission, through MoDOT, to determine and fix the extent of the damages caused by a breach of any contractual or regulatory DBE Program requirement and that the damage assessment will be enforced in addition to, and not in lieu of, any other general liquidated damages clause in the contract. By submitting a bid for a federal-aid contract, and by entering into a contract, the bidder irrevocably agrees to such an assessment of liquidated damages for DBE Program purposes, and authorizes the Commission and MoDOT to make such an assessment of liquidated damages against the contractor, and to collect that assessment from any sums due the contractor under the contract, or any other contract, or by other legal process. The bidder makes this certification, agreement and authorization on behalf of itself, its subcontractors and suppliers, and the bid bond and contract bond sureties, for each federal-aid contract.

(g) The surety upon any bid or contract bond acknowledges the surety is held and firmly bound to the Commission for each and every duty of the surety's principal provided in any bid or contract regarding the DBE program.

10.0 Designation of DBE firms to perform on contract. The bidder states and certifies, under penalty of perjury or other applicable penal laws, that the DBE participation information submitted in the bid or within the stated time thereafter is true, correct and complete and that the information provided includes the names of all DBE firms that will participate in the contract, the specific line item (s) that each DBE firm will perform, and the creditable dollar amounts of the participation of each DBE. The specific line item must reference the MoDOT line number and item number contained in the proposal. The bidder further states and certifies that the bidder has committed to use each DBE firm listed for the work shown to meet the DBE contract goal and that each DBE firm listed has clearly confirmed that the DBE firm will participate in and perform the work, with the DBE's own forces. Award of the contract will be conditioned upon meeting these and other listed requirements of 49 CFR 26.53.

(a) The bidder certifies the bidder's understanding that as the contractor on a contract funded in whole or in part by USDOT federal funds, the bidder may not unilaterally terminate, substitute for, or replace any DBE firm that was designated in the executed contract, in whole or in any part, with another DBE, any non-DBE firm or with the contractor's own forces or those of an affiliate, without the prior written consent of MoDOT. The bidder understands it must receive approval in writing from MoDOT for the termination of a DBE firm, or the substitution or replacement of a DBE before any substitute or replacement firm may begin work on the project in lieu of the DBE firm participation information listed in the executed contract.

(1) The bidder further certifies understanding, that if a DBE firm listed in the bid or approved in the executed contract documents ceases to be certified at any time during the performance of the contract work, and a contract or subcontract with that firm has not yet been executed by the prime and subcontractor, the contractor can not count any work performed by that firm after the date of the firm's loss of eligibility toward meeting the DBE contract goal. However, if the contractor has executed a subcontract with the firm before the DBE lost eligibility and ceased to be a certified DBE, the contractor may continue to receive credit toward the DBE contract goal for that firm's work.

(2) The bidder further certifies understanding, that if a DBE subcontractor is terminated, or fails, refuses or is unable to complete the work on the contract for any reason, the contractor must promptly request authority to substitute or replace that firm. The request shall include written documentation that the DBE firm is unwilling or unable to perform the specified contract work. The contractor shall make good faith efforts to find another DBE subcontractor to substitute or replace the dollar amount of the work that was to have been performed by the DBE firm. The good faith efforts shall be directed at finding another DBE to perform the same, or more, dollar amount of work that the DBE firm that was terminated was to have performed under the executed contract. The substitute or replacement DBE firm may be retained to perform the same or different contract work from that which the terminated firm was to have performed. The contractor shall obtain approval from MoDOT in writing before the replacement or termination of one firm with another before the work will count toward the project DBE goal.

(3) The bidder further certifies the bidder's understanding, that the dollar value of any work completed by a DBE firm prior to approval of the DBE's substitution or replacement, in writing, by MoDOT will not be credited toward meeting the DBE contract goal. The contractor will remain subject to appropriate administrative remedies, including but not limited to, liquidated damages for the full dollar amount that the DBE contract goal is not met. Liquidated damages will also be assessed against the contractor if the original, substitute or replacement DBE firms perform the required contract work, but are not paid in full for some or all of that work by the contractor, including back charges. No credit toward the DBE goal will be given for any amount withheld from payment to the DBE or "back charged" against monies owed to the DBE, regardless of the purpose or asserted debt.

11.0 Good Faith Effort to Secure DBE Services. The bidder shall make a good faith effort to seek DBEs in a reasonable geographic area to where the solicitation for subcontracts and material is made. If the bidder cannot meet the goals using DBEs from that geographic area, the bidder shall, as a part of the effort to meet the goal, expand the search to a wider geographic area.

11.1 Bidding Procedure. The following bidding procedure shall apply to the contract, for DBE program compliance purposes.

11.2 Contract Goal, Good Faith Efforts Specified. The bidder may submit the completed "DBE Identification Submittal" information in the bid documents at the same time as, and within the sealed bid, at the time the bid is submitted. However, if that information is not completed and submitted with the initial sealed bid, then as a matter of responsiveness and responsibility, the apparent low and second low bidder shall file the completed "DBE Identification Submittal" pages with MoDOT on or before 4:00 p.m. of the third business day after the bid opening date, directly to the External Civil Rights Division, Missouri Department of Transportation, 105 W. Capitol Avenue, P.O. Box 270, Jefferson City, Missouri 65102-0270. Telefax transmittal to MoDOT will be permitted at fax no. (573) 526-0558. The complete and signed original documents shall be mailed to MoDOT no later than the day of the telefax transmission. No extension of time will be allowed for any reason. The means of transmittal and the risk of timely receipt of the information shall be the bidder's.

11.3 Bid Rejection, Bid Security Disposition. The failure of either the apparent low bidder or the second low bidder to file the completed and executed "DBE Identification Submittal", listing actual, committed DBE participation equal to or greater than the DBE contract goal percentage specified in the bid by 4:00 p.m. on the third business day after the bid opening, will be cause for rejection of that bid, and the bid surety bond or bid guaranty of that bidder will be forfeited to and become the property of the Commission upon Commission demand.

(a) Any bidder rejected for failure to submit the completed and executed "DBE Identification Submittal" information in the bidding documents, with full documentation of sufficient DBE participation to satisfy the DBE contract goal cannot submit a bid on the same, or substantially similar, project, when and if the project is re-advertised for bids. By submitting a bid on a federal-aid project, the bidder accepts and agrees to this provision, and the disposition of the bidders bid bond or guaranty, on behalf of the bidder and the bidders bid surety or guaranty.

(b) The surety separately acknowledges the surety to be held and firmly bound to the Commission to immediately upon demand pay to Commission the face amount of the bid bond.

11.4 Good Faith Efforts Described. Good faith efforts to meet the DBE contract goal may include, but are not limited to, the following:

(a) Attending a pre-bid meeting, if any, scheduled by the department to inform DBEs of contracting and subcontracting opportunities.

(b) Advertising in general circulation trade association and socially and economically disadvantaged business directed media concerning subcontracting opportunities.

(c) Providing written notice to a reasonable number of specific DBEs so that the DBE's interest in the contract are solicited in sufficient time to allow the firm to participate effectively.

(d) Following-up on initial written notice or solicitations of interest by contacting DBEs to determine with certainty whether the DBEs were interested.

(e) Maintaining documentation of responses received in the effort to solicit DBE participation.

(f) Selecting portions of work to be performed by DBEs to increase the likelihood of meeting the DBE goal, including, where appropriate, breaking down contracts into economically feasible units to facilitate DBE participation.

(g) Providing interested DBEs adequate information about plans, specifications and requirements of the contract.

(h) Negotiating in good faith with interested DBEs, not rejecting DBEs as unqualified without sound business reasons based on a thorough investigation of the DBE's capabilities.

(i) Making efforts to assist interested DBEs in obtaining bonding, lines of credit or insurance required by MoDOT or by the bidder.

(j) Making effective use of available disadvantaged business organizations, minority bidders' groups, local, state and federal disadvantaged business assistance offices, MoDOT and other organizations that provide assistance in the recruitment and placement of DBEs.

11.5 Documentation, and Administrative Reconsideration of the Bidder's Good Faith Efforts. In the bidding documents, the bidder has the opportunity and responsibility to provide certified written documentation as to whether the bidder made a good faith effort to meet the DBE contract goal as proposed by the Commission. Any bidder that has not met the Commission's proposed DBE contract goal at the time of bid opening must submit the completed "Certification of Good Faith Efforts to Obtain DBE Participation". The certification should be included in the bidding documents, fully and in detail, at the time its sealed bid is submitted; however, if that information is not completed and submitted with the initial sealed bid, the bidder must submit the documentation to MoDOT on or before 4:00 p.m. of the third business day after the bid opening date, directly to the External Civil Rights Division, Missouri Department of Transportation, 105 W. Capitol Avenue, P.O. Box 270, Jefferson City, Missouri 65102-0270. Telefax transmittal to MoDOT will be permitted at fax no. (573) 526-0558. The complete and signed original documents shall be mailed to MoDOT no later than the day of the telefax transmission. No extension of time will be allowed for any reason. The means of transmittal and the risk of timely receipt of the information shall be the bidder's. The bidder shall attach additional pages to the certification, if necessary, in order to fully detail specific good faith efforts made to obtain certified DBE firm participation in the proposed contract work. If the apparent low bidder appears to have failed to adequately document in the bid that the bidder made a good faith effort to achieve sufficient DBE participation in the contract work, that firm will be offered the opportunity for administrative reconsideration upon written request, before MoDOT and the Commission reject that bid as non-responsive. However, regardless of the DBE contract goal participation level proposed by the bidder, or the extent of good faith efforts shown, the apparent low and second low bidders shall each timely and separately file their completed and executed "DBE Identification Submittal" or face potential sanctions and the bid bond or guaranty, as specified in Sec 10.0 of these provisions, may become the property of the Commission subject to Commission's demand.

12.0 DBE Participation for Contract Goal Credit. DBE participation on the contract will count toward meeting the DBE contract goal as follows:

(a) The applicable percentage of the total dollar value of the contract or subcontract awarded to the DBE will be counted toward meeting the DBE contract goal, only if that firm is certified by the Missouri Regional Certification Committee as a DBE before the due date for bids or offers on a contract which a firm seeks to participate as a DBE, and only for the value of the work, goods or services that are actually performed, or provided, by the DBE firm itself in the area(s) in which the DBE firm is certified.

(b) When a DBE performs work as a participant in a joint venture, the contractor may count toward the DBE goal only that portion of the total dollar value of the contract equal to the distinct, clearly defined portion of the contract work that the DBE has performed with the DBE's own forces. The MoDOT External Civil Rights Division shall be contacted in advance regarding any joint venture involving both a DBE firm and a non-DBE firm to review and approve the contractor's organizational structure and proposed operation. When a DBE subcontracts part of the work of the contract to another firm, the value of that subcontracted work may be counted toward the DBE contract goal only if the DBE's subcontractor at a lower tier is a MoDOT certified DBE. Work that a DBE subcontracts to a non-DBE firm will not count toward the DBE contract goal. The cost of

supplies and equipment a DBE subcontractor purchases or leases from the prime contractor or the prime's affiliated firms, or from another non-DBE subcontractor, will not count toward the DBE contract goal.

(c) The contractor may count expenditures to a DBE subrecipient toward the DBE contract goal only if the DBE performs a commercially useful function (CUF) on that contract.

(d) A contractor may not count the participation of a DBE subcontractor toward the contractor's final compliance with the contractor's DBE contract goal obligations until the amount being counted has actually been paid to the DBE. A contractor may count 60 percent of the contractor's expenditures actually paid for material and supplies obtained from a DBE certified by MoDOT as a regular dealer, and 100 percent of such expenditures actually paid for materials and supplies obtained from a certified DBE manufacturer.

(1) A regular dealer will be defined as a firm that owns, operates, or maintains a store, warehouse or other establishment in which the material, supplies, articles or equipment required and used under the contract are bought, kept in stock, and regularly sold or leased to the public in the usual course of business. To be a regular dealer, the DBE firm shall be an established, regular business that engages, as its principal business and under its own name, in the purchase and sale or lease of the products in question. Packagers, brokers, manufacturers' representatives, or other persons who arrange or expedite transactions will not be considered regular dealers.

(2) A DBE firm may be a regular dealer in such bulk items as petroleum products, steel, cement, gravel, stone or asphalt, without owning, operating or maintaining a place of business where it keeps such items in stock, if the DBE both owns and operates distribution equipment for the products it sells and provides for the contract work. Any supplementation of a regular dealer's own distribution equipment shall be by a long-term lease agreement, and not on an *ad hoc* or contract-by-contract basis.

(3) If a DBE regular dealer is used for DBE contract goal credit, no additional credit will be given for hauling or delivery to the project site goods or materials sold by that DBE regular dealer. Those delivery costs shall be deemed included in the price charged for the goods or materials by the regular dealer, who shall be responsible for their distribution.

(4) A manufacturer will be defined as a firm that operates or maintains a factory or establishment that produces on the premises, the material, supplies, articles or equipment required under the contract and of the general character described by the project specifications. A manufacturer will include firms that produce finished goods or products from raw or unfinished material, or that purchases and substantially alters goods and materials to make them suitable for construction use before reselling them.

(e) A contractor may count toward the DBE contract goal the following expenditures to certified DBE firms that are not "regular dealers" or "manufacturers" for DBE program purposes:

(1) The contractor may count toward the DBE contract goal the entire amount of fees or commissions charged by a certified DBE firm for providing a bona fide service, such as professional, technical, consultant or managerial services, or for providing bonds or insurance specifically required for the performance of the federal-aid contract, if the fee is reasonable and not excessive, compared with fees customarily charged for similar services.

(2) The contractor may count toward the DBE contract goal the entire amount of that portion of the construction contract that is performed by the DBE's own forces and equipment, under the DBE's supervision. This includes the cost of supplies and material ordered and paid for by the DBE for contract work, including supplies purchased or equipment leased by the DBE except supplies and equipment a DBE subcontractor purchases or leases from the prime contractor or its affiliates.

(f) A contractor may count toward the DBE contract goal 100 percent of the fees paid to a certified DBE trucker or hauler for delivery of material and supplies required on a job site, but not for the cost of those materials or supplies themselves, or for the removal or relocation of excess material from or at the job site, when the DBE certified trucking company is not also the manufacturer of or a regular dealer in those material and supplies, provided that the trucking or hauling fee is determined by MoDOT to be reasonable as compared with fees customarily charged by non-DBE firms for similar services. The certified DBE trucking firm shall also perform a CUF on the project and not operate merely as a pass through for the purposes of gaining credit toward the contract DBE goal. Prior to submitting a bid, the contractor shall determine, or contact the MoDOT External Civil Rights Division for assistance in determining, whether a DBE trucking firm will meet the criteria for performing a CUF on the project.

(g) The contractor will receive DBE contract goal credit for the fees or commissions charged by and paid to a DBE broker who arranges or expedites sales, leases or other project work or service arrangements, provided that those fees are determined by MoDOT to be reasonable and not excessive, as compared with fees customarily charged by non-DBE firms for

similar services. A broker will be defined as a person or firm that does not own or operate the delivery equipment necessary to transport materials, supplies or equipment to or from a job site; a broker typically will not purchase or pay for the material, supplies or equipment, and if the broker does purchase or pay for those items, those costs will be reimbursed in full. In most instances, the broker is merely the entity making arrangements for delivery of material, supplies, equipment, or arranging project services. To receive DBE contract goal credit, MoDOT must determine that the DBE broker has performed a CUF in providing the contract work or service.

13.0 Performing a Commercially Useful Function (CUF). No credit toward the DBE contract goal will be allowed for contract payments or expenditures to a DBE firm, if that DBE firm does not perform a CUF on that contract. A DBE performs a CUF when the DBE is solely responsible for execution of a distinct element of the contract work, and the DBE actually performs, manages and supervises the work involved with the firm's own forces. To perform a CUF, the DBE alone shall be responsible, and alone must bear the risk, for the material and supplies used on the contract, selecting a supplier or dealer from those available, negotiating price, determining quality and quantity, ordering the material and supplies, installing those materials with the DBE's own forces and equipment and paying for those materials and supplies. The amount the DBE firm is to be paid under the contract shall be commensurate with the work the DBE actually performs and the DBE credit claimed for the DBE's performance.

13.1 Contractor's Obligation to Monitor CUF Performance. It shall be solely the contractor's responsibility to ensure that all DBE firms perform a CUF. Further, the contractor is responsible to, and shall ensure that each DBE firm fully performs the DBE's designated tasks, with the DBE's own forces and equipment, under the DBE's own direct supervision and management. MoDOT is under no obligation to warn the contractor that a DBE's participation may not count toward the goal, other than through official notification with an opportunity for administrative reconsideration at the conclusion of the contract work.

13.2 DBEs Must Perform a Useful and Necessary Role in Contract Completion. A DBE does not perform a commercially useful function if the DBE's role is limited to that of an extra participant in a transaction, contract, or project through which funds are passed in order to obtain the appearance of DBE participation.

13.3 DBEs Must Perform The Contract Work With Their Own Workforces. If a DBE does not perform and exercise responsibility for at least 30 percent of the total cost of the DBE's contract with the DBE's own work force, or the DBE subcontracts a greater portion of the work of a contract than would be expected on the basis of normal industry practice for the type of work involved, MoDOT will presume that the DBE is not performing a commercially useful function.

13.4 Factors Used to Determine if a DBE Trucking Firm is Performing a CUF. The following factors will be used to determine whether a DBE trucking company is performing a commercially useful function (CUF):

(a) To perform a CUF, the DBE trucking firm shall be completely responsible for the management and supervision of the entire trucking operation that the DBE is being paid for on the contract work. There shall not be contrived arrangement, including but not limited to, any arrangement that would not customarily exist under regular construction project subcontracting practices for the purpose of meeting the DBE contract goal.

(b) The DBE must own and operate at least one fully licensed, insured and operational truck used in performance of the contract work. This does not include a supervisor's pickup truck or a similar vehicle that is not suitable for hauling the necessary materials or supplies.

(c) The DBE receives 100 percent contract goal credit for the total reasonable amount the DBE is paid for the transportation services provided on the contract using trucks the DBE owns, insures and operates, using drivers that the DBE employs.

(d) The DBE may lease trucks from another DBE firm, including an owner-operator who is certified as a DBE. The DBE firm that leases trucks from another DBE will receive credit for the total fair market value actually paid for of the transportation services the lessee DBE firm provides on the contract.

(e) The DBE may also lease trucks from a non-DBE firm, including an owner-operator. However, the DBE who leases trucks from a non-DBE is entitled to DBE contract goal credit only for the brokerage fee or commission the DBE receives as a result of the lease arrangement. The DBE will not receive credit for the total value of the transportation services provided by the non-DBE lessee. Furthermore, no DBE contract goal credit will be allowed, even for brokerage fees or commissions, where the DBE leases the trucks from the contractor on the project or a firm owned, controlled by, or affiliated by ownership or control to, the contractor.

(f) For purposes of this section, the lease shall indicate that the DBE firm leasing the truck has exclusive use of and control over the truck. This will not preclude the leased truck from working for others during the term of the lease with the consent of the DBE, provided the lease gives the DBE absolute priority for and control over the use of the leased truck. Leased

trucks shall display the name and identification number of the DBE firm that has leased the truck at all times during the life of that lease.

13.5 MoDOT Makes Final Determination On Whether a CUF Is Performed. MoDOT and the Commission will have the final authority to determine whether a DBE firm has performed a CUF on a federal-aid contract. To determine whether a DBE is performing or has performed a CUF, MoDOT will evaluate the amount of work subcontracted by that DBE firm or performed by other firms, and the other firms forces and equipment. Any DBE work performed by the contractor, or by employees or equipment of the contractor will be subject to disallowance under the DBE Program, unless the independent validity and need is demonstrated.

14.0 Verification of DBE Participation, Liquidated Damages.

14.1 Prior to final payment by the Commission, the contractor shall file with the Commission a detailed list showing each DBE used on the contract work, and the work performed by each DBE. The list shall show the actual dollar amount paid to each DBE for the creditable work on the contract, less any rebates, kickbacks, deductions, withholdings or other repayments made. The list shall be certified under penalty of perjury, or other law, to be accurate and complete. MoDOT and the Commission will use this certification and other information available to determine if the contractor and the contractor's DBEs satisfied the DBE contract goal percentage specified in the contract and the extent to which the DBEs were fully paid for that work. The contractor shall acknowledge, by the act of filing the detailed list, that the information is supplied to obtain payment regarding a federal participation contract.

14.2 Failure on the part of the contractor to achieve the DBE participation to which the contractor committed in the contract may result in liquidated damages being imposed on the contractor by the Commission for breach of contract and for non-compliance. If the contract was awarded with less than the original DBE contract goal proposed by the Commission, the revised lower amount shall become the final DBE contract goal, and that goal will be used to determine any liquidated damages to be assessed. Additionally, the Commission or MoDOT may impose any other administrative sanctions or remedies available at law or provided by the contract in the event of breach by the contractor by failing to satisfy the contractor's DBE contract goal commitment. However, no liquidated damages will be assessed, and no other administrative sanctions or remedies will be imposed when, for reasons beyond the control of the contractor and despite the good faith efforts made by the contractor, the final DBE contract goal participation percentage was not achieved. The contractor will be offered the opportunity for administrative reconsideration of any assessment of liquidated damages, upon written request. The administrative reconsideration officer may consider all facts presented, including the legitimacy or business reason for back charges assessed against a DBE firm, in determining the final amount of liquidated damages.

15.0 Prompt Payment Requirements. In accordance with Title 49 CFR 26.29, the contractor shall comply with the prompt payment requirements of that regulation, Section 34.057, RSMo., the provisions of the Commission's rule 7 CSR 10-8.111 and the contract. By bidding on a federal-aid contract, and by accepting and executing that contract, the contractor agrees to assume these contractual obligations, and to bind the contractor's subrecipients contractually to those prompt payment requirements at the contractor's expense.

16.0 Miscellaneous DBE Program Requirements. In accordance with Title 49 CFR Part 26 and the Commission's DBE Program rules in Title 7 CSR Division 10, Chapter 8, the contractor, for both the contractor and for the contractor's subcontractors and suppliers, whether DBE firms or not, shall commit to comply fully with the auditing, record keeping, confidentiality, cooperation and anti-intimidation or retaliation provisions contained in those federal and state DBE Program regulations. By bidding on a federal-aid contract, and by accepting and executing that contract, the contractor agrees to assume these contractual obligations, and to bind the contractor's subrecipients contractually, at the contractor's expense.

TRAINING PROVISION

1.0 Description. This provision supplements subparagraph 7(e) of the Contract Provision entitled "Standard Federal Equal Opportunity Construction Contract Specification" (Executive Order 11246)", and in the implementation of CFR Part 230, Subpart A, Appendix B.

2.0 Training Requirements. As part of the contractor's equal employment opportunity affirmative action program, training shall be provided as follows.

2.1 The contractor shall provide on-the-job training aimed at developing full journeymen in the type of trade or job classification involved.

2.2 The number of trainee hours to be provided under this provision will be specified in the bidding documents.

2.3 Trainee goals will be set in 1,000 hour increments or 1 slot (person). For example, if the trainee goal on the project is 2,000 hours a maximum of 2 trainees will be approved for the project. In the event a trainee leaves the project for valid reasons the trainee shall be replaced as soon as possible. No apprentice/trainee can be assigned less than 500 hours on a contract. Providing less than 500 hours is not considered to be beneficial training nor helping to achieve journey-level status. Therefore, a trainee/apprentice, regardless of craft, must have been trained on the contact for at least 500 hours to be eligible for reimbursement. However, the contractor may transfer the trainee, with MoDOT's approval, to another MoDOT highway construction project in order to continue the training. Upon reaching the 500 hours, the contractor will be compensated as noted herein. If the enrollee is transferred to a non-federal project, MoDOT, upon availability of funding, may have the option of reimbursing the contractor for those hours completed that achieve the 500-hour minimum and for any hours that continue the successful training of the individual(s). The same documentation will be required to be submitted in order to determine if hours will be approved. However, if the trainee is moved to another federally funded enhancement, then a "change order" could be requested for the additional hours, and thus offer the Contractor the necessary credit so as to accomplish the 500 hour plateau. FHWA and MoDOT will only approve training programs meeting the requirements of the Training Special Provisions (TSP). A program will be approved if it is reasonably calculated to meet the equal employment opportunity obligations of the Contractor and to qualify the average trainee for journeyman status in the classification concerned by the end of the training period. Furthermore, apprenticeship programs registered with the U.S. Department of Labor, Bureau of Apprenticeship and Training, or with a State apprenticeship agency recognized by the Bureau and training programs approved but not necessarily sponsored by the Department of Labor, Manpower Administration, Bureau of Apprenticeship and Training will also be considered acceptable provided it is being administered in a manner consistent with the equal employment obligations of Federal-aid highway construction contracts.

2.4 When a contractor subcontracts a portion of the contract work, the contractor shall determine how many, if any, of the trainee hours are to be trained by the subcontractor, provided, however, that the contractor shall retain the primary responsibility for meeting the training requirements imposed by this provision.. The contractor shall also insure this training provision is made applicable to such subcontract. Where feasible, 25 percent of apprentices or trainees in each occupation shall be in their first year of apprenticeship or training.

2.5 The number of trainee hours shall be distributed among the work classifications on the basis of the contractor's needs and the availability of journeymen in the various classifications within a reasonable area of recruitment. Prior to commencing construction, the contractor shall submit to the engineer for approval a trainee notification for each individual they intend to train on the project. The contractor will be credited for the hours worked by each trainee employed on the contract work who is currently enrolled or becomes enrolled in an approved program and will be reimbursed for such trainees as provided hereinafter. If the trainee goal on the project is 1,000, no more than two trainees will be approved for the project. Each individual must complete at least 500 hours before reimbursement or hour will be counted towards meeting the goal. In the event a trainee leaves the training program prior to completing the minimum 500 hours the External Civil Rights Division will determine if that individual can be replaced on the project.

2.6 Training and upgrading of minorities and women toward journeyman status is a primary objective of this provision. Accordingly, the contractor shall make every effort to enroll minority trainees and women (e.g., by conducting systematic and direct recruitment through public and private sources likely to yield minority and women trainees) to the extent that such persons are available within a reasonable area of recruitment. The contractor shall be responsible for demonstrating the steps taken in pursuance thereof, prior to a determination as to whether the contractor is in compliance with this provision. This training commitment is not intended, and shall not be used, to discriminate against any applicant for training, whether a member of a minority group or not.

2.7 No employee shall be employed as a trainee in any classification in which the employee has successfully completed a training course leading to journeyman status or in which the employee has been employed as a journeyman. The contractor shall satisfy this requirement by including appropriate questions in the employee application or by other suitable means. Regardless of the method used the contractor's records shall document the findings in each case.

2.8 The minimum length and type of training for each classification will be as established in the training program selected by the contractor and approved by the engineer and FHWA. A program will be approved if it is reasonably calculated to meet the equal employment opportunity obligations of the contractor and to qualify the average trainee for journeyman status in the classification concerned by the end of the training period... Furthermore, apprenticeship programs registered with the U.S. Department of Labor, Bureau of Apprenticeship and Training, or with a state apprenticeship agency recognized by the Bureau of apprenticeship and training programs approved, but not necessarily sponsored by, the Department of Labor, Manpower Administration, Bureau of Apprenticeship and Training, will also be considered acceptable provided the training is being administered consistent with the equal employment obligations of Federal-aid highway construction contracts.

2.9 Approval or acceptance of a training program shall be obtained from the engineer prior to beginning work on the classification covered by the program. It is the intention of these provisions that training is to be provided in the construction crafts rather than clerk-typists or secretarial-type positions. Training will be permissible in lower level management positions,

such as office engineers, estimators, timekeepers, etc., where the training is oriented toward construction applications and must be approved by FHWA. Training in the laborer classification may be permitted, provided significant and meaningful training is provided and approved by the engineer. Some offsite training will be permissible as long as the training is an integral part of an approved training program and does not comprise a significant part of the overall training.

2.10 Except as otherwise noted below, the contractor will be reimbursed $10.00 per hour of training given an employee in the contract in accordance with an approved training program. As approved by the engineer, reimbursement will be made for training persons in excess of the number of trainee hours specified in the contract. Reimbursement will be made even though the contractor receives additional training program funds from other sources, provided such other sources do not specifically prohibit the contractor from receiving other reimbursement. Reimbursement for offsite training indicated above may only be made to the contractor when the trainees are concurrently employed on a federal-aid project and the contractor does one or more of the following, and contributes to the cost of the training, provides instruction to the trainee, or pays the trainee's wages during the offsite training period. In order receive the reimbursement the trainee must complete at least 500 hours on the project

2.11 No payment will be made to the contractor if either failure to provide the required training or failure to hire the trainee as a journeyman is caused by the contractor and evidences a lack of good faith on the part of the contractor in meeting the requirements of this provision. It is normally expected that a trainee will begin training on the project as soon as feasible after start of work, utilizing the skill involved and remain on the project as long as training opportunities exist in the trainee's work classification or until the trainee has completed the training program. It is not required that all trainees be on board for the entire length of the contract. The contractor's responsibilities under this provision will be fulfilled if the contractor has provided acceptable training for the number of trainee hours specified.

2.12 Trainees shall be paid at least 60 percent of the appropriate minimum journeyman's rate specified in the contract for the first half of the training period, 75 percent for the third quarter of the training period, and 90 percent for the last quarter of the training period, unless apprentices or trainees in an approved existing program are enrolled as trainees on this project. In that case, the appropriate rates approved by the U.S. Department of Labor or Transportation in connection with the existing program will apply to all trainees being trained for the same classification who are covered by this provision.

2.13 Contractor may choose to transfer trainee hours worked on another project, whether MoDOT or not. The contractor must submit monthly trainee reports for that project to the RE Office where the hours will be credited. The contractor must submit with the monthly trainee reports, copies of the certified payrolls so the RE Office can verify the number of hours worked on the project, as well as the wage the trainee was being paid. Once the RE reviews the monthly reports, copies of the monthly reports should be sent to the External Civil Rights Division. The RE Office should include with the report a note indicating the hours that are being transferred from the other project. Both job numbers must be included in the note.

2.14 When the job is 50% complete the contractor must have at least 50% of the trainee hours assigned on that job completed. The percentage of job completion is based on the total value of the contract paid to the Contractor. The remaining amount of the hours must be completed before the completion of the project or the Contractor will be subject to liquidated damages unless a GFE is submitted to and approved by the External Civil Rights Division.

2.15 If the training hours have not been obtained and a GFE has not been displayed upon project completion, the Contractor will be assessed liquidated damages in the amount of $20.00 per hour for those hours not realized. For instance, if the project goal was 1,000 hours and only 450 hours were met, then liquidated damages would be assessed at 550 x $20.00 = $11,000.00.

2.16 In the event the External Civil Rights Division denies the Good Faith Effort (GFE) submitted by the contractor, the contractor shall have the right to an Administrative Reconsideration Hearing. The request for an Administrative Reconsideration Hearing must be made within seven (7) days of the receipt of the denial letter. The Administrative Reconsideration Committee may be constituted, as MoDOT deems appropriate and fair, provided no committee member on the Reconsideration Committee shall have taken part in the original MoDOT determination that the contractor failed to meet the OJT contract goal and/or failed to make adequate good faith efforts to do so.

2.17 If the Administrative Reconsideration Committee does not find the contactor met the OJT contract goal, and/or does not find the contractor made adequate and sufficient good faith efforts to do so, then the Administrative Reconsideration Committee will recommend that liquidated damages as outlined in the non-compliance sanctions sections of the OJT Training Special Provision will be carried out. If the Administrative Reconsideration Committed does find that the contractor has met a good faith effort (GFE), then no liquidated damages will be assessed.

2.18 If the Contractor does not achieve the full OJT goal, they will not receive partial credit for hours completed. For instance, if the goal on the project was 1,000 hours and only 450 were convened, then no reimbursement will be given for any hours fulfilled. If the goal on the project is 2,000 hours and only 1,500 hours are completed and no GFE is demonstrated, the contractor will receive credit for the 1,500 hours and also be assessed liquidated damages in the amount of the 500 hours there were not met.

2.19 The contractor shall furnish to the trainee a copy of the training program the contractor will follow in providing the training. The contractor shall provide each trainee and the resident engineer with a certification showing the type and length of training satisfactorily completed.

2.20 The contractor shall provide for the maintenance of records and furnish monthly reports documenting the contractor's performance under this provision. Monthly reports shall include at least the following information:

Contractor's name and address
Period that the report covers
Job Number, Description, and Federal Aid number
Information for each employee being trained on the project, including:
- Name
- Social Security Number
- Trade/craft
- Pay percent, based on portion of training complete (if applicable)
- Journeyman's full prevailing wage applicable
- Trainee wage
- Hours this period
- Cumulative hours for the project

Total trainee hours for the project for this period
Cumulative trainee hours for the project

2.21 When a contractor submits a trainee who is economically disadvantaged the following information should be submitted with the trainee notification to verify this status:

- The previous year's tax return verifying the individual's income is less than the federal poverty guidelines.
- Verification of enrollment in food stamps received from Missouri Department of Social Services.
- Verification of housing assistance received from Missouri Department of Social Services.

OPTIONAL ROLLER COMPACTED CONCRETE SHOULDERS AND MAINLINE

01/16

1.0 Description. Roller Compacted Concrete (RCC) is an optional method to be used in constructing A2 and A3 shoulders or mainline pavement up to 7 inches thick in lieu of conventional PCCP or HMA placement. RCC may be used, as designed in the plans, for mainline pavements greater than 7 inches. RCC consists of aggregate, portland cement and water. Supplementary cementing materials, such as fly ash, slag cement (ground granulated blast- furnace slag - GGBFS), and silica fume may be used. RCC is proportioned, mixed, placed, compacted, and cured in accordance with these specifications. RCC shall conform to the lines, grades, thickness, and typical cross section shown in the plans or otherwise established by the Engineer.

2.0 Materials. All materials shall be in accordance with Division 1000, Materials Details, and specifically as follows:

Item	Section
Coarse Aggregate	1005.2
Fine Aggregate	1005.3
Ground Granulated Blast Furnace Slag	1017
Fly Ash	1018
Cement	1019
Concrete Admixture	1054
Curing Compound	407, 1055
Water	1070

2.1 Aggregate. The plasticity index of the aggregates used shall not exceed 5. The aggregate gradation shall be well-graded without gradation gaps and shall meet the following combined gradation for the application type for RCC specified in the contract:

Application	**RCC as a Base or Intermediate Lift** (Overlaid with 2-inch HMA or greater)	**RCC as the Final Surface or with a Thin Lift Overlay** (RCC as the final surface or capped with a thin HMA overlay less than 2-inches)
Sieve Size	**Percent Passing by Weight**	**Percent Passing by Weight**
1 inch	100	---
¾ inch	---	100
½ inch	70 - 95	85 - 100

3/8 inch	60 - 85	---
No. 4	40 - 60	60 - 85
No. 8	--	40 - 60
No. 200	0 - 8	0 - 10

3.0 Mix Design. At least 30 days prior to the beginning of placing RCC on the project, the Contractor shall submit a proposed mix design to the Engineer. The target and allowable gradation range of each fraction shall be included. The contractor may be required to submit representative samples of each ingredient to Construction and Materials for laboratory testing.

3.1 Required Information. The mix design shall contain the following information:

(a) Source, type and specific gravity of portland cement

(b) Source, type (class, grade, etc.) and specific gravity of supplementary materials, if used

(c) Source, name, type and amount of admixture, if used

(d) Source, type (formation, etc.), ledge number if applicable, of the aggregate

(e) Specific gravity and absorption of each fraction in accordance with AASHTO T 85 for coarse aggregate and AASHTO T 84 for fine aggregate, including raw data

(f) Unit weight of each fraction in accordance with AASHTO T 19

(g) Batch weights of portland cement and supplemental cementitious materials

(h) Batch weights of coarse, intermediate and fine aggregates

(i) Batch weight of water in pounds per cubic yard (optimum moisture content)

(j) Maximum laboratory density

(k) The laboratory proctor curves illustrating moisture contents vs. density for each cementitious material content.
The RCC mix design shall be done in a similar fashion as is done to determine the relationship between the moisture content and the unit weight as soils and soil aggregate mixtures. The apparatus and compacted effort used to fabricate the moisture density specimens correspond to that described in AASHTO T 180, Method D. Strength specimens shall be made in accordance with ASTM C 1176 or ASTM C 1435 at the optimum moisture content for each cementitious material content to verify minimum compressive strength requirements.

3.2 Trial Batch. The Contractor shall prepare and test a trial batch mixture at the mixing facility to verify that the RCC mix complies with the design criteria. The trial batch shall be prepared and tested in the presence of the Engineer.

3.3 Production. Production shall not begin until an approved mix design has been obtained and verified by the trial batch.

3.4 Design Strength. The mix design shall have a minimum compressive strength of 3,500 psi within 28 days when specimens prepared according to ASTM C 1176 or ASTM C 1435. Compressive strength test shall be performed in accordance with AASHTO T 22.

3.5 Minimum Water Content. The water-cement ratio shall not be lower than 0.25.

3.6 Minimum Cementitious Content. The total amount of cementitious materials shall not be below 450 pounds per cubic yard.

3.7 Supplementary Cementitious Material. RCC may use fly ash, slag cement (GGBFS), or silica fume. Ternary mixes will be allowed for RCC. Ternary mixes are mixes that contain a combination of portland cement and two supplementary cementitious materials. The amount of supplementary cementitious material content shall be limited to the following requirements:

Supplementary Cementitious Material (SCM)	
SCM	**Maximum Percent of Total Cementitious Material**
Fly Ash (Class C or Class F)	25 %
Slag Cement (GGBFS)	30 %

Silica Fume	8 %
Ternary Combinations	40 %

4.0 Equipment. RCC shall be constructed with any combination of equipment that will produce a pavement meeting the requirements for mixing, transporting, placing, compacting, finishing, and curing as provided in this specification.

4.1 Mixing Plant: The mixing plant shall be capable of producing RCC to the proportions defined by the final approved mix design and within the specified tolerances. The capacity of the plant shall be sufficient to produce a uniform mixture at a rate compatible with the placement equipment.

4.2 Paver: RCC shall be placed with a high-density or conventional asphalt type paver subject to approval by the Engineer. The paver shall be of suitable weight and stability to spread and finish the RCC material, without segregation, to the required thickness, smoothness, surface texture, cross-section, and grade.

4.3 Compactors: When a conventional asphalt type paver is used, self-propelled steel drum vibratory rollers shall be used for primary compaction. For final compaction, a steel drum roller, operated in a static mode, or a rubber-tired roller may be utilized to meet density requirements.

4.4 Haul Equipment: The hauling equipment shall be smooth, mortar-tight, metal containers capable of discharging the concrete at a controlled rate without segregation. Hauling equipment shall have a retractable cover to protect mix from weather and excessive evaporation.

4.5 Access for Inspection and Calibration: The Engineer shall have access at all times for any plant, equipment, or machinery to be used in order to check calibration, scales, controls, or operating adjustments.

5.0 Construction Requirements.

5.1 Preparation of Subgrade. Before the RCC processing begins, the subgrade and base course must be prepared in accordance with Sec 304.

5.2 Subbase Condition. The surface of the subbase shall be clean and free of foreign material and standing water prior to placement of the RCC. The aggregate base shall be uniformly moist at the time of RCC placement. RCC shall not be placed upon frozen subbase.

5.4 Mixing Time. Mixing time shall be adequate to ensure a thorough and complete mixing of all materials. Concrete shall be homogeneous with no aggregate segregation. In no case shall the mixing time, after all materials including water are in the mixer, be less than 90 seconds.

5.5 Operating Tolerances. The mixing plant shall receive the quantities of individual ingredients to within the following tolerances:

Material	Variation by Weight
Cementitious Materials	± 2.0%
Water	± 3.0%
Aggregates	± 4.0%

5.6 Plant Calibration. Prior to RCC production, the Contractor shall calibrate the plant in accordance with the manufacturer's recommended practice. A copy of the calibration shall be provided to the Engineer when requested.

5.7 Curing. Immediately after final rolling, the RCC surface shall be kept continuously moist until an approved curing compound is applied. The application of the curing compound shall progress such that no more than 10 linear feet of the final RCC surface is exposed without curing at any time.

5.7.1. Water Cure. Water cure shall be applied such that a uniform moist condition on the surface of the RCC is attained. Application of this moisture shall be done in a manner that will not erode or damage the finished RCC surface.

5.7.2 Curing Compound. When RCC is used as the final surface, either white pigmented curing compound applied at the rate of one gallon for each 100 square feet or a tack coat product applied at 0.14 gal/yd^2 shall be used for curing. When RCC is to be overlaid with asphalt, the curing compound shall be a tack coat product applied at 0.14 gal/yd^2 in accordance with Sec 407.

5.8 Weather Conditions.

5.8.1 Hot Weather Precautions. During periods of hot weather or windy conditions, special precautions shall be taken to minimize moisture loss due to evaporation.

5.8.2 Cold Weather. The contractor shall provide a method, meeting the approval of the engineer, of monitoring the concrete that demonstrates that the concrete has been protected from freezing.

5.8.3 Protection Against Rain. To protect against rain, the contractor shall have on location at all times material for the protection of the unhardened concrete. The contractor shall protect the concrete from damage due to rain.

5.9 Finished Surface. The finished RCC surface shall be smooth, uniform, and continuous without tears, ridges, or aggregate segregation once it leaves the paver. RCC mainline pavement shall meet the smoothness criteria of Sec 502.8. When RCC is the final surface, the finished surface texture shall be broom finished, diamond ground, or other finishes approved by the engineer. All finished surface textures shall be in accordance with Sec 502.4.

5.9.1 Inaccessible Areas. All areas inaccessible to either roller or paver shall be paved with cast-in-place concrete in accordance with Sec 502.

5.9.2 Handwork. Broadcasting or fanning the RCC material across areas being compacted is not permissible. Such additions of materials may only be done immediately behind the paver and before any compaction has taken place.

5.9.3 Segregation. If segregation occurs in the RCC during paving operations, placement shall cease until corrective measures are taken.

5.10 Cold Joints. Prior to placing fresh RCC mixture against a cold vertical joint, the joint shall be thoroughly cleaned of loose or foreign material. The vertical joint face shall be wetted and in a moist condition immediately prior to placement of the adjacent lane.

5.11 Control Joints. Concrete control joints shall be constructed at 15-foot intervals in RCC mainline pavement. Control joint spacing for RCC shoulders adjacent to HMA or composite pavement shall be a minimum of 30-foot intervals. RCC shoulders adjacent to existing PCC pavement shall have control joints located to match the joints of the adjacent pavement. For all other PCC joint spacing; the RCC control joints shall match the adjacent PCC pavement's joints or cracks not to exceed a 30-foot interval. All control joints shall be tooled or cut to 1/3 the depth of the RCC thickness. Sealing the control joints is not required.

5.12 Opening to Traffic. The Contractor shall protect the RCC from traffic during the curing period. The RCC shoulder pavement may be opened to light traffic after one day and opened to unrestricted traffic after 5 days. The RCC mainline pavement may be opened to light traffic at 2,500 psi and opened to unrestricted traffic at 3,000 psi.

6.0 Material Acceptance.

6.1 Quality Control Testing. The contractor shall perform all quality control tests necessary to control the production and construction processes applicable to this specification. Quality control testing shall be performed by technicians qualified through MoDOT's technician certification program. Testing shall include, but not necessarily be limited to, deleterious content, aggregate gradation, coarse aggregate absorption, thin or elongated pieces, pavement thickness and density. The contractor shall record all test results and furnish a copy to the engineer no later than the beginning of the day following the test.

6.2 Quality Control Plan. A Quality Control Plan (QCP) for RCC mainline pavement and shoulders will be required as per Sec 502.11.1.

6.3 Testing.

6.3.1 Density. The density shall be determined in accordance with AASHTO T 310, direct transmission. Tests shall be performed no later than 30 minutes after the completion of the rolling. Only wet density shall be used for evaluation. QC shall determine the density of the RCC shoulder and mainline pavement at a frequency of no less than one per 7500 square yards. Sampling locations will be determined by the engineer using random sampling procedures in accordance with ASTM D 3665.

6.3.2 Thickness. The contractor shall determine thickness of the RCC shoulder and mainline pavement by testing the fresh concrete. The Resident Engineer will need to review and approve the testing procedure. QC shall determine the thickness of the RCC mainline pavement and shoulders at a frequency of no less than one per 7,500 square yards. Sampling locations will be determined by the engineer using random sampling procedures in accordance with ASTM D 3665.

6.4 Aggregate Gradation. A sieve analysis shall be performed once a week. Testing shall be performed in accordance with AASHTO T 27 from randomly sampled material taken from the discharge gate of storage bins or from the conveyor belt.

6.5 Deleterious Materials. Deleterious content shall be determined each day at a frequency of one test per 7500 square yards of material placed or fraction thereof. Test shall be performed in accordance with MoDOT TM 71 from randomly sampled material taken from the discharge gate of storage bins or from the conveyor belt. Tests shall be performed on coarse aggregate fractions.

6.6 Absorption. Samples for coarse aggregate absorption shall be taken from the discharge gate of storage bins or from the conveyor belt at least once every 2000 cubic yards with a minimum of once per project. Coarse aggregate absorption shall be performed in accordance with AASHTO T 85.

6.7 Thin or Elongated. Thin or elongated pieces shall be determined on samples of coarse aggregate taken from the discharge gate of the storage bins or from the conveyor belt. Test shall be performed in accordance with ASTM D 4791 using a ratio of 5:1. Test shall be performed on aggregate particles retained on the ¾ in. sieve. Tests shall be performed at least once every 10,000 cubic yards with a minimum of once per project.

6.8 Retained Samples. All aggregate samples taken by the contractor, including but not limited to gradation, deleterious, absorption, and thin or elongated pieces shall be retained for the engineer for a minimum of seven days unless otherwise instructed. The retained sample shall be the remaining half of the final reduction in sample size obtained for QC testing. These samples shall be maintained in clean covered containers, without contamination, readily accessible to the engineer. The retained sample's identification shall consist of, but is not limited to:

(a) Time and date sampled

(b) Product specification number

(c) Type of sample, i.e. belt, bin, stockpile

(d) Lot and sublot designation

(e) Sampler/Tester

(f) Project Job Number

6.9 Acceptance.

6.9.1 Density. The density shall not be less than 98 percent of the maximum laboratory density.

6.9.1.1 Compressive Strength. Roller compacted concrete properly placed and compacted, but not meeting the density requirements shall be cored and tested for compressive strength at no additional cost. Cores shall be taken in accordance with AASHTO T 24. The compressive strength shall be determined by approved methods. Cores shall be tested for compressive strength within 7 days of density testing. If the tested area achieves the design strength, the material will be paid for at full price. Areas that fail to comply with the design strength will be deemed unacceptable and shall be addressed in accordance with Sec 105.11.

6.9.2 Thickness. The thickness shall not be deficient by more than 10 percent of the plan thickness. Areas that fail to comply with the design thickness will be deemed unacceptable and shall be addressed in accordance with Sec 105.11.

6.9.3 Aggregate Gradation. When one test is outside the allowable gradation range, immediate steps shall be taken to correct the gradation.

6.9.4 Deleterious Materials. When one test is outside the specification limits, immediate steps shall be taken to correct the deleterious content.

6.9.5 Absorption. The contractor shall halt production and make appropriate adjustments whenever either of the following occurs:

(a) One point falls outside the action limit line for individual measurement

(b) Two points in a row fall outside the specification limit but within the action limit line for individual measurement

6.9.5.1 Action Limits. The following action limit shall be used to control the aggregate absorption.

Individual Measurements	
Control Parameter	**Action Limit**
Absorption	Mix Design plus 0.3% to Mix Design plus 0.6%

6.9.6 Thin or Elongated Pieces. The coarse aggregate shall not have more than 5 percent thin or elongated pieces.

7.0 Quality Assurance.

7.1 Independent Samples. Corrective action shall be required when any QA tests are outside the required ranges or action limits. The engineer will at a minimum, independently test at the following frequency:

Test	Frequency
Density	1 test per 30,000 square yards
Thickness	1 test per 30,000 square yards
Aggregate Gradation	1 per project
Coarse Aggregate Deleterious	1 per week
Absorption	1 per 10,000 cubic yards
Thin or Elongated	1 per project

7.2 Test Procedures. The engineer will use the same test procedures as the contractor for determining the density and thickness of the RCC.

7.3 Retained Samples. The QA inspector will test at least ten percent of the retained portion of the QC samples for aggregate gradations and deleterious content. The QA inspector will test at least twenty percent of the QC retained samples for absorption and thin or elongated pieces. Retained samples will be chosen at random. A comparison will be considered favorable when the QA results of a QC retained sample are within the applicable limits specified in Sec 403.

8.0 Method of Measurement. Final measurement of the completed pavement will not be made except for authorized changes during construction, or where appreciable errors are found in the contract quantity. Where required, measurement of the RCC mainline pavement and shoulders, complete in place, will be made to the nearest 1/10 square yard. The revision or correction will be computed and added to or deducted from the contract quantity.

9.0 Basis of Payment. The accepted quantities of RCC will be paid for at the contract unit price, for specified A2 or A3 shoulders or mainline. Sec 610 for smoothness pay factor adjustments will apply to the final RCC mainline pavement surface. The contract unit price for A2 or A3 shoulders or mainline pavement will be considered as full compensation for all materials, equipment, tools, labor, and incidentals necessary to satisfactorily complete the work. No additional compensation will be allowed for any excess thickness.

ASPHALT CEMENT PRICE INDEX

12/11; 01/17

1.0 Asphalt Cement Price Index. Adjustments will be made to the payments due the Contractor for any plant mix bituminous base, plant mix bituminous pavement, plant mix bituminous surface leveling, asphaltic concrete pavement and ultrathin bonded asphalt wearing surface that contains performance graded (PG) asphalt binder when it has been determined that the Monthly Asphalt Index for the month prior to placement of the asphalt mixture has fluctuated from the Monthly Asphalt Index for the month the project was let. The Monthly Asphalt Index shall be established for each calendar month as the average of the midpoint selling prices of PG64-22 for St. Louis and Kansas City, Missouri areas, as published by Poten & Partners Inc. in the Asphalt Weekly Monitor®, on the first Monday preceding the date of the normal monthly MoDOT letting. For months when there is no normal monthly letting, the published price on the third Monday of that month shall be used for the Monthly Asphalt Index. Special lettings shall have no effect on determining the Monthly Asphalt Index. The asphalt base index shall be the Monthly Asphalt Index for the month of the bid opening. For calculation of the price adjustment, any asphalt placed on the first day of a month will be included with the asphalt placed the previous month in order to keep price adjustments in sync with the payment estimate period schedule.

1.1 The price adjustment will be applied to the actual amount of virgin PG asphalt binder used by the Contractor for all asphalt items specified in 1.0. For asphalt mixture that are paid for with square yard pay items, the price adjustments will be made for applicable equivalent tons, as calculated by the engineer, based upon the plan square yard quantity and thickness converted to tons, excluding the 1:1 wedge. The price adjustment will be applied to all Job Order Contract projects for all quantities of the wet ton and square yard asphalt mix. The percentage of virgin PG asphalt binder as shown in the job mix formula, in accordance with Sec 401, Sec 403 and Sec 413, will be the basis for price adjustments for any asphalt mix type placed on the project. The effective asphalt binder obtained from the use of Recycled Asphalt Pavement (RAP) and/or Recycled Asphalt Shingles (RAS) will not be eligible for adjustment. The Monthly Asphalt Index for PG64-22 will be applied to the asphalt mix for mixes using any PG asphalt binder.

2.0 Price Adjustment Calculated. To determine the price adjustment for any asphalt mix specified in this provision, the following formula will be used.

$A = (B \times C/100) \times (D-E)$

Where:
A = Dollar value adjustment for mix placed during the payment estimate period
B = Tons of asphalt mixture placed during the payment estimate period
C = Percent of virgin PG asphalt binder as listed in the job mix formula in use
D = The Monthly Asphalt Index for the month prior to the month the asphalt mix was placed
E = The asphalt base index = the Monthly Asphalt Index for the month the project was let

2.1 The engineer will apply the price adjustments, as determined by the price adjustment calculation established herein, for each payment estimate period in which asphalt is placed, except for any asphalt placed after the allowable contract time period as defined in Sec 108. For asphalt placed after the contract completion time limit, the "D" value used for the price adjustment calculated shall be either the last "D" value prior to the date that contract time was exceeded, or the current monthly "D" value, whichever is lower.

3.0 Optional. This provision is optional. If the bidder wishes to be bound by this provision, the bidder shall execute the acceptance form in the Bid. Failure by the bidder to execute the acceptance form will be interpreted to mean election to not participate in the Asphalt Cement Price Index. If the Asphalt Cement Price Index is accepted, PG asphalt binder for the project will not be eligible for a material allowance as described in Sec 109.

SAFETY PLAN

04/16

1.0 Description. This contractor shall submit to the engineer a project Safety Plan (SP) for all work performed by the contractor and all subcontractors. The purpose of the SP is to encourage and enable all work to be performed in the safest possible manner and that all parties involved are aware of their individual responsibility for safety on the jobsite.

1.1 The SP shall be completed by the contractor and provided to the engineer prior to the beginning of any construction activity or phase on the project.

1.2 The contractor shall designate a person to serve as Project Safety Manager (PSM). The PSM shall be responsible for implementing and overseeing the SP. The PSM is not required to be present on the project at all times, but must be available to address safety issues and needs.

1.3 The PSM shall make revisions to the SP as necessary. Any new project activities or phases shall be included in the SP prior to work beginning on that activity or phase.

1.4 An example Safety Plan is available at: www.modot.org/safetyplan

2.0 Emergency Preparedness. The SP shall outline and detail for all workers, the specific procedures and actions necessary to respond to a jobsite emergency and the measures taken to communicate these requirements to all workers.

2.1 The SP shall include a list of local emergency contacts including phone numbers. A copy of the emergency contact list shall be accessible to workers.

2.2 In the case where there is no cellular or land line phone service at the jobsite, the SP shall identify how to reach the nearest available phone service.

3.0 Project Safety Analysis. The SP should contain a basic Project Safety Analysis (PSA) that outlines the actions necessary to complete each activity or phase of the project. The SP shall include a general description of the primary activities or steps required to safely complete the project.

3.1 Each activity should also include a general description of the work involved along with the known risks associated with the activity. In addition the PSA should outline the controls for those risks, including any Personal Protection Equipment (PPE) requirements for that activity or phase, and whether or not the activity or phase requires a specific safety meeting prior to beginning the activity or phase.

3.2 Submittal of the PSA for all activities or phases is not required with the initial submittal of the SP; however, the PSA for each activity or phase shall be completed prior to the beginning of that activity or phase.

4.0 Safety Meetings. The SP shall include the types of safety meetings that will be required of and conducted by the contractor.

5.0 Safety Training. The SP shall identify the required safety training provided to the contractor's personnel. The contractor shall require that the appropriate safety training for the contractor's personnel is completed prior to the beginning of work on each activity or phase.

5.1 The SP shall identify the recommended safety training needs and PPE for MoDOT employees who will be exposed to the work activities. MoDOT will provide safety training and PPE to MoDOT employees based on MoDOT safety policies.

6.0 Payment. There will be no direct payment for compliance with this Safety Plan provision.

SAFETY EDGE

04/16

1.0 Description. An approved longitudinal shoulder wedge system shall be used to create a beveled edge at the edge of pavement for a roadway without a paved shoulder, or at the edge of shoulder for pavement with a paved shoulder up to and including 4 feet in width.

2.0 Construction Requirements. The shoulder wedge system shall result in a bevel measuring 30 degrees from horizontal and extending laterally from the edge of traveled way or shoulder to the point of intersection with the inslope. The construction tolerance shall be plus or minus 5 degrees.

2.1 The shoulder wedge system shall maintain contact between the device and road shoulder surface and allow automatic transition to cross roads, driveways and obstructions. The device must be removable or be able to be lifted when not in use.

2.2 All shoulder wedge systems to be used for the purpose of creating a Safety Edge must be approved by the engineer. The device must be designed to constrain the material, increase the consolidation of the extruded profile, and provide a smooth wedged surface. The use of a conventional single plate strike-off is not permitted.

3.0 Basis of Payment. There will be no direct payment for compliance with the requirements of this provision.

E-CONSTRUCTION

01/17

1.0 Description. e-Construction is a paperless construction administration delivery process that includes electronic submission of construction documents, approval of documents with digital signatures, and communication between stakeholders by mobile devices. e-Construction saves both time and money for all stakeholders involved, simplifies document storage, and eliminates waste of paper and other resources. This provision does not apply to the contract or other contract execution documents.

2.0 Document Submittals.

2.1 The contractor shall submit all required documents to MoDOT electronically, except as described in section 2.2 of this provision. Documents to be submitted electronically include, but are not limited to, Change Orders, Request to Subcontract Work (C-220), Project Payrolls, Progress Schedules, Value Engineering proposals, Safety Plans, Quality Plans, Pre-Construction conference submittals, etc. All documents shall be submitted in standard pdf format, except when otherwise directed by the engineer.

2.2 The Affidavit for Compliance with the Prevailing Wage Law and the Contractor's Affidavit Regarding Settlement of Claims (Form C-242) require a notarization and therefore, by law, must be submitted on paper.

2.3 The engineer will submit project documents to the contractor via email or through other secure file sharing sites, except that the Contractor Performance Questionnaire will be submitted by certified mail.

2.4 Documents that require multiple signatures, such as change orders, must include all required signatures on the original electronic document, without scanning.

2.5 Project Payrolls from subcontractors shall be digitally signed by the subcontractor. Payrolls shall be submitted as separate files per contractor per pay period.

3.0 Digital Signature.

3.1 All electronic documents that require signature, such as those listed in section 2.1, must be signed electronically. Scanning an ink-signed document is not considered a valid digital signature.

3.2 All users who are authorized to sign documents for the contractor shall submit their Digital Signature Certificate (Public Key .fdf file) to the Division of Construction prior to signing any documents. This file is used to validate the user's signature on documents. An authorization letter is also required for each person authorized to sign documents. A Digital Signature for Contractors Quick Reference Guide (QRG) is available on MoDOT's Engineering Policy Guide at http://epg.modot.mo.gov/ (click on QRG in the left hand column).

4.0 Communication. The contractor shall be able to communicate and exchange information with MoDOT staff by email and mobile phone.

5.0 Basis of Payment. No payment will be made for compliance with this provision.

"RATE OUR WORK ZONE" SIGNS

03/12; 05/12

1.0 Description. This work shall consist of furnishing and installing a 72 X 36 inch or 48 X 24 inch "Rate Our Work Zone" signs, as indicated in the plans. The contractor shall furnish signs, labor, equipment, posts and hardware for installation of the signs in accordance with this provision, or as directed by the engineer.

2.0 Material. All material shall be in accordance with Division 1000, Material Details.

3.0 Construction Requirements. The signs shall be post-mounted and placed approximately 500 feet before the beginning of the project limits or the "ROAD WORK AHEAD" sign or the "ROAD WORK NEXT XX MILES" sign, if used, when these signs are located outside the project limits for each direction of travel affected by the project. A project on only one pavement of a dual divided facility will require only one sign. The contractor shall maintain all signs until completion of the project. Upon completion of the project, the contractor shall remove the signs, posts and hardware. The signs, posts and hardware shall remain the property of the contractor.

4.0 Basis of Payment. The accepted quantity of signs will be paid for at the contract unit price per square feet of construction signs.

"POINT OF PRESENCE" SIGNS

03/12; 05/12

1.0 Description. This work shall consist of furnishing and installing a 36 X 48 inch or a 96 X 48 inch "Point of Presence" signs, as indicated in the plans. The contractor shall furnish signs, labor, equipment, posts and hardware for installation of the sign in accordance with this provision or as directed by the engineer.

2.0 Construction Requirements. The sign shall be placed as shown on the plans. A project impacting only one direction of a divided highway will require only one sign. The contractor shall maintain all signs until completion of the project. Upon completion of the project, the "Point of Presence" signs shall remain in place ninety days with the "Completed as Promised" decal or plaque attached. After the ninety day period expires, the contractor shall be required to remove the sign. The sign, decal or plaque, posts and hardware will remain the property of the contractor.

2.1 The 36 X 48 inch "Point of Presence" sign shall be post mounted on two 3-pound/foot U-channel posts, or one-2 ½ inch perforated square steel tube post.

2.2 The 96 X 48 inch "Point of Presence" sign shall be post mounted on three 3-pound/foot U-channel posts with 32-inch spacing between posts.

3.0 Basis of Payment. The accepted quantity of "Point of Presence" signs will be paid for at the contract unit price per square feet of construction signing. The "Completed as Promised" decal or plaque shall be considered incidental to the "Point of Presence" sign.

SERVICE SIGNING

1.0 Description. All installation, relocation and repair of Missouri LOGO, Tourist Oriented Destination Signs (TODS) and General Service Signing shall be coordinated between the engineer, contractor and the designated Missouri LOGO representative.

1.1 It shall be noted by the contractor that Missouri LOGOS is responsible for the installation, relocation and repair of all LOGO, TODS and General Service Signs on MoDOT owned right of way. The contractor shall be solely responsible and liable for determining any impact to LOGO, TODS or General Service Signing due to contractor operations during construction of this contract. The contractor shall be responsible for notifying Missouri LOGOS at the time of the preconstruction meeting when a service sign is determined to be impacted and advise Missouri LOGOS of the project details. The Missouri LOGO representative will attend these meetings at their discretion.

The Missouri LOGO representative shall be contacted 24 hours a day, 7 days per week at (573) 291-6788.

1.2 Missouri LOGOS will be responsible any installation or relocation of service signs necessary for this contract. If Missouri LOGO's has to perform work within the limits of the project, Missouri LOGOS will conduct work so as not to interfere with or hinder the progress or completion of the work being performed by the contractor. Full cooperation of the contractors involved, in careful and complete coordination of their respective activities in the area, will be required.

2.0 Basis of Payment. No direct payment will be made to the contractor to recover the cost of equipment, labor, materials or time required to fulfill this provision.

REVISIONS TO 2016 MISSOURI STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION

SECTION 102 – BIDDING REQUIREMENTS AND CONDITIONS

Delete Secs 102.3.3 thru 102.3.5 and substitute the following: ***01/17***

102.3.3 Bidders that submit bids via the internet shall have on file with the Commission an "Electronic Signature Agreement", a copy of which can be found on MoDOT's website. This agreement shall be initiated by the prospective bidder and submitted to the Commission. A bid will not be opened and read unless a fully executed agreement is on file with the Commission at least seven days prior to the time set for the opening of the bids.

102.3.4 The *Missouri Standard Specifications for Highway Construction*, *Missouri Standard Plans for Highway Construction*, including all revisions of these documents, and other items referenced in the bidding documents, whether attached or not, will be considered a part of the bid. A prospective bidder will be expected to obtain the current edition of the *Missouri Standard Specifications for Highway Construction* and the *Missouri Standard Plans for Highway Construction*, including all revisions of these documents, which can be found on MoDOT's website.

102.3.5 Bidders will be responsible for any additional fees associated with submitting bids using Trns•port Expedite® Electronic Bidding System software and the BidExpress® website.

Delete Secs 102.7 thru 102.13 and substitute the following: ***01/17***

102.7 Preparation of Bidding Documents.

102.7.1 Bids submitted shall be prepared using the latest version of Trns•port Expedite® Bid and be submitted using the BidExpress® website. Each bidder shall specify in the bid, in figures, a unit price for each of the separate items listed. The bidder shall not enter zero in any "Unit Price" field unless zero is the intended bid for that item. A unit price left blank will be considered a zero by the Commission. In case of alternate items, unit prices shall be entered for only one alternate, unless otherwise specified in the bidding documents.

102.7.2 A bidder may submit a separate bid on any or all projects, except that bids shall be submitted for all projects in a required combination. Bidders not having the ability to simultaneously execute all contracts for bids submitted during a bid opening may state, in one of the bids, the maximum total value of contract awards the bidder is willing to accept for that bid opening. Only one statement of "Maximum Monetary Value of Awards Accepted this Bid Opening" shall be completed per bid opening. In the event a bidder submits multiple statements of maximum award, the lowest value stated will be used. The Commission reserves the right to select and award the combination of bids, not exceeding this maximum, that will be to the best interest of the State, provided these bids are in conformance with the requests for bids. Any corrected bid that exceeds the lowest specified maximum award may be declared non-responsive.

102.7.3 Bids submitted shall have the digital ID of an individual authorized to sign bids for their respective company. The individual must be identified as an officer for the company on the contractor questionnaire.

102.7.4 The bid by a partnership or joint venture, including individuals doing business under fictitious names or corporations, shall only submit one bid for the partnership or joint venture.

102.7.5 The bid by a corporation, whether acting alone or as a joint venturer, shall show the address and name of the corporation exactly as shown on the contractor questionnaire, and shall include the signature or digital ID and title of a person authorized by its board of directors to bind the corporation.

102.7.6 Each bidder shall submit with each bid a sworn statement, executed by or on behalf of the bidder to whom a contract may be awarded, certifying that the bidder has not, either directly or indirectly, entered into any agreement, participated in any collusion or otherwise taken any action in restraint of free competitive bidding in connection with the bid or any contract that may result from its acceptance.

102.7.7 A bid will not be accepted or considered if the bid is the product of collusion among bidders, if the bidder is disqualified or determined not responsible or if the bid is irregular in accordance with Sec 102.8.

102.7.8 Subcontractor disclosure. For contracts of more than $2,000,000 each bidder shall submit with each bid a disclosure of the subcontracts that have a subcontract value that is equal to or greater than twenty percent of the total project bid or subcontracts that are greater than or equal to $2,000,000. The disclosure of subcontracts must include the name of each subcontractor, the category of work that each subcontractor will perform (e.g. asphalt, concrete, earthwork, bridges…) and the

dollar value of each subcontract. The information shall be disclosed on the form provided in the bidding documents. If that information is not available at the time of bid the bidder shall submit the "Subcontractor Disclosure Form" pages with MoDOT on or before 4:00 p.m. of the third business day after the bid opening date, directly to the Design Division, Missouri Department of Transportation, 105 W. Capitol Avenue, P.O. Box 270, Jefferson City, Missouri 65102-0270. Telefax transmittal to MoDOT will be permitted at fax no. 573-522-2281. Failure to disclose this information may result in a bid being declared non-responsive. The complete signed original documents do not need to be mailed to MoDOT, but the bidder shall have it available if requested by the Design Division or the engineer.

102.8 Irregular Bids. Bids that are not completed in accordance with the bidding documents, that show any omissions, false statements or certifications, alterations of form, additions not called for, conditional or alternate bids unless called for, irregularities of any kind, or that are declared non responsive to the request for bids may be rejected. Bids combining or otherwise tying sections or projects not listed in the bidding documents as being in combination will be deemed irregular bids and will be rejected. Any comment in the bid limiting or qualifying the reserved right of the Commission to make awards that will be to the best interest of the State will constitute an irregular bid.

102.8.1 A bid will be considered irregular and may be rejected if any of the unit bid prices are mathematically or materially unbalanced to the detriment of the Commission.

102.9 Bid Guaranty. No bid will be considered unless accompanied by a certified check or cashier's check on any bank or trust company insured by the Federal Deposit Insurance Corporation, payable to the Director of Revenue, Credit State Road Fund, for no less than five percent of the amount of the bid, or by a bid bond secured by an approved surety or sureties in accordance with Secs 103.4.2 and 103.4.3, for no less than five percent of the amount of the bid. Bidders may submit a bid bond for each project bid or an annual bid bond that would cover all projects bid for a twelve-month period beginning July 1 and ending June 30 of each state fiscal year. Annual bid bond forms shall be submitted by June 15 of each year. Forms delivered by US Mail should be mailed to: Missouri Highways and Transportation Commission, Attention: Annual Bid Bond, PO Box 270, Jefferson City, MO 65102. Forms delivered by parcel delivery services, (such as UPS, Fed Ex, DHL etc) should be shipped to Missouri Highways and Transportation Commission, Attention: Annual Bid Bond, 105 West Capitol Avenue, Jefferson City, MO 65102. The Commission will notify the bidder by letter that the annual bid bond form is approved. Bid bonds shall be submitted on forms furnished by the Commission, which are available on MoDOT's website. Bid bond forms will be furnished to the prospective bidder upon request. Electronically produced copies of the bid bond form may be utilized, however, the exact wording used on the Commission furnished form shall be included in full and without deviation. Bid bond forms shall be complete and correct at the time of submittal or the bid may be considered non-responsive. Only the version of the bid bond form provided with the request for bid shall be submitted, unless the Request for Bid or Notice of Bid Opening authorizes the use of alternate bid bond forms. The bid bond power of attorney shall be an original document, not a facsimile. Bids accompanied by bid guaranties that are not in accordance with this section or accompanied by bid bonds that are not issued by an approved surety will be rejected.

102.9.1 Bidders may choose to submit a paper or electronic bid guaranty in accordance with Sec 102.9.

102.9.1.1 The electronic bid bond shall be part of the digitally signed bid and be verified via digital encryption by the bonding agent.

102.9.1.2 If utilizing an annual bid bond as a bid guaranty, it is the responsibility of the bidder to verify that each bid submittal does not exceed the annual bid bond limit. If a bid security maximum amount is specified for the annual bid bond and the bidder chooses to submit bids exceeding the maximum, it is the responsibility of the bidder to contact the surety for an increased annual bid bond or separate bid bond. The Bidder may choose to submit a project-specific bid bond in addition to an existing annual bid bond already on file with MoDOT.

102.10. Bids shall be submitted via the internet using the latest version of Trns Port Expedite Bid, and be submitted using the BidExpress website. All bids shall be filed prior to the time specified in the notice to contractors. BidExpress will not accept any bids submitted after that time.

102.11 Any request for withdrawal of a bid submitted electronically shall be completed through Bid Express® prior to the time set for opening bids. The bidder may submit multiple electronic bids on the same project, however, the last bid received supersedes all previous submittals.

102.12 Combination Bids. Combination bids for two or more projects may be required or permitted and will be designated as such in the bidding documents.

102.12.1 On required combinations, the bidder shall complete the bid for each project included in the combination.

102.12.2 On permitted combinations, the bidder will be allowed to combine all projects in the combination or bid each project separately. The Commission reserves the right to determine the combination and make awards of the bids, that will be to the best interest of the State, provided they are in conformance with the request for bids and the bids submitted.

102.12.2.1 The bidder shall leave the project's bid items blank for all projects not bid in the permitted combination.

102.12.2.2 To combine all projects in a permitted combination, the bidder shall enter a complete bid for each project and mark the "All or None" box in the Bid. By marking "All or None" and combining all the projects, the bidder will be awarded all the projects in the combination or none of the projects.

102.12.2.3 If the bidder does not combine all of the projects, bids for the individual projects will be considered separately. The bidder shall complete the bid for each project the bidder desires to bid.

102.12.3 Two or more projects awarded in combination will be considered to be covered by a single contract. If during construction an item for which a unit price has not been bid is encountered in one project of a combination, the unit price bid for the same item in another project of the combination will apply, unless there is conclusive proof that conditions are changed significantly to effect a definite increase or decrease in the cost of the operation.

102.13 Bids will be opened and the bid totals made public.

SECTION 105 – CONTROL OF WORK

Amend Sec 105.7.6 to include the following and renumber subsequent sections accordingly: ***01/17***

105.7.6 The contractor agrees that any effects of the presence of the utilities, their relocation, contractor's coordination of work with the utilities and any delay in utility relocation shall not be compensable as a suspension of work, extra work, a change in the work, as a differing site condition or otherwise including but, without limitation, delay, impact, incidental or consequential damages. The contractor's sole remedy for the effects of the presence of utilities, delay in their relocation or any other effects shall be an excusable delay as provided in Sec 105.7.6.1. The contractor waives, for itself, its subcontractors and suppliers the compensability of the presence of utilities, delay in their relocation and any cost to the contractor, it's subcontractors and suppliers in any claim or action arising out of or in relation to the work under the contract.

SECTION 109 – MEASUREMENT AND PAYMENT

Delete Sec 109.14 and substitute the following: ***01/17***

109.14 Price Adjustment for Fuel. If the contractor accepts the option for fuel adjustment in the bid proposal, the method of price adjustment for the fuel used on the items of work specified herein will be based on "Fuel Usage Factors" The following table specifies the fuel usage factors for Production and On-Road Hauling. The On-Road Hauling Factor is based on an average 30-mile round trip and will be used regardless of the actual haul distance.

Item of Work	Unit	Fuel Usage Factor for Production	Fuel Usage Factor for On-Road Hauling	Total Fuel Usage Factor
Class A Excavation	gal/yd^3	0.20	n/a	0.20
Unclassified Excavation	gal/yd^3	0.30	n/a	0.30
Class C Excavation (Includes Sandstone and Igneous Rock Excavation)	gal/yd^3	0.40	n/a	0.40
Embankment in Place	gal/yd^3	0.35	n/a	0.35
Bituminous Construction on Roadways, Shoulders and Entrances. Includes both full depth asphalt and overlays. Includes all asphalt mixes under	gal/ton of total asphalt mix	2.65	0.67	3.32

Secs 401, 402 and 403, as well as Ultrathin Bonded Asphalt Wearing Surface (UBAWS). Asphalt mixes paid by SY will be converted to equivalent tons using a factor of 1.98 tons/yd^3.				
Concrete Pavement Construction on Roadways, Shoulders and Entrances. Includes both full depth concrete and overlays. Includes roller compacted concrete. Round to nearest 1 in. increment. (e.g. if 7.5" pavement use 8 in. factor). If less than 6 in., use 6 in. factor. Concrete paid by CY will be converted to equivalent thickness.	gal/yd^2 6 in. 7 in. 8 in. 9 in. 10 in. 11 in. 12 in. 13 in. 14 in.	 0.27 0.29 0.31 0.33 0.35 0.36 0.39 0.41 0.42	 0.22 0.26 0.29 0.33 0.37 0.41 0.44 0.48 0.52	 0.49 0.55 0.60 0.66 0.72 0.77 0.83 0.89 0.94
Aggregate Base Construction[a] on Roadways, Shoulders and Entrances.	gal/yd^2 3in. 4 in. 5 in. 6 in. 7 in. 8 in. 9 in. gal/ton gal/yd^3	 n/a n/a n/a n/a n/a n/a n/a n/a n/a	 0.11 0.15 0.19 0.23 0.26 0.30 0.34 0.67 1.35	 0.11 0.15 0.19 0.23 0.26 0.30 0.34 0.67 1.35

[a] Includes all base in Secs 302 and 304, when hauled to the project, but does not include material in Secs 303 or 310. Does not include any base produced within project limits or adjacent to the project. Includes base shown in pay limits for optional shoulder designs (e.g. A3 shoulder), but not the portion identified as incidental base.

SECTION 110 – STATE AND FEDERAL WAGE RATES AND OTHER REQUIREMENTS

Delete Sec 110.3 and substitute the following: ***01/17***

110.3 Prevailing Wages and Records. The prevailing state wage rate, overtime and fringe benefits for the locality of the work as determined by the Missouri Department of Labor and Industrial Relations, or by a court decision on appeal, will be contained in the contract. The effective date for the current wage rate, overtime and fringe benefits, for bidding purposes, will be in the bid documents by special provision. The contractor and all subcontractors shall pay no less than the prevailing wage rate, overtime and fringe benefits as specified or as same may be changed by a court decision on appeal, for all work performed under the contract. Per 290.250 RSMo., the contractor shall forfeit a penalty up to $100 per day per worker for each worker that is paid less than the prevailing rate for any work done under the contract by the contractor or any subcontractor as determined by the Missouri Department of Labor.

Amend Sec 1103.3 to include the following: ***01/17***

110.3.3 Subsistence Deductions. The contractor shall comply with all applicable federal and state laws for employee payroll deductions for subsistence and as specified herein:

(a) The contractor shall provide to the engineer a copy of the employee-signed agreement for each employee that agrees to a subsistence deduction prior to that employee beginning work on the project. If the employee does not speak English, such agreement shall be written in his/her native language.

(b) The contractor shall document each purpose (food, lodging, travel etc.) and amount of all subsistence deductions and provide documentation in support of each deduction to the engineer.

(c) The subsistence deductions shall serve the convenience and interest of the employee. No profit or other benefit shall otherwise be obtained, directly or indirectly, by the contractor or subcontractor or any affiliated person in the form of commission, dividend or otherwise.

SECTION 215 – SHAPING SLOPES

Amend Secs 215.1.3 thru 215.1.3.1 to include the following: ***10/16***

215.1.3 Shaping Slopes, Class III, shall consist of providing fill material and shaping slopes to construct additional shoulder width for the installation of guardrail and Type A crashworthy end terminals in accordance with Missouri Standard Plans for Highway Construction. Material used shall be Type 1, 5, or 7 Aggregate Base, or other granular material approved by the engineer. Any excess material shall be disposed of outside the limits of the right of way.

215.1.3.1 In lieu of aggregate base, earth material may be used for Shaping Slopes, Class III. When earth material is used, an approved seed mixture shall be applied in accordance with Sec 805, mulch shall be applied in accordance with Sec 802 and erosion and sediment control shall be utilized in accordance with Sec 806. All cost for seeding, mulching, and erosion control shall be incidental to the cost of Shaping Slopes, Class III.

Amend Sec 215.2.1 to include the following: ***10/16***

215.2.1 Benching of the existing slope may be necessary to provide stability to the additional shoulder width constructed by Shaping Slopes, Class III. All costs for benching shall be included in the cost of Shaping Slopes, Class III.

Delete Secs 215.3.2 thru 215.4 and substitute the following: ***10/16***

215.3.2 Shaping Slopes, Class I, Class II, or Class III will apply only to those sections that have been specifically designated as such on the plans.

215.4 Basis of Payment. The accepted quantity of shaping slopes will be paid for at the contract unit price for each of the pay items included in the contract. If Shaping Slopes, Class I, Class II, or Class III is not provided but is required, payment will be in accordance with Sec 104.3. No direct payment will be made for any additional material required for shaping slopes.

SECTION 310 – AGGREGATE SURFACE

Delete Sec 310.1 and substitute the following: ***01/17***

310.1 Description. This work shall consist of furnishing and placing chat, gravel or crushed stone surfacing in the quantity shown in the contract document or as directed by the engineer.

Delete Sec 310.3.1 and substitute the following: ***01/17***

310.3.1 General. The contractor shall furnish, haul and spread surfacing material on the subgrade at the designated rate. The rate of application may be varied at the discretion of the engineer, depending on the nature of the soil encountered in the subgrade. The contractor shall uniformly unload and distribute the required quantity of material throughout each station. The subgrade shall be prepared as specified in Sec 209, and any work done in reshaping the subgrade before placing surfacing material shall be at the contractor's expense. When it is determined by the engineer to be to the Commission's advantage, hauling may be done over surfacing material previously spread, otherwise, all hauling shall be over the subgrade.

Delete Sec 310.6 and substitute the following: ***01/17***

310.6 Basis of Payment. The accepted quantities of aggregate surface will be paid for at the contract unit price

SECTION 401 – PLANT MIX BITUMINOUS BASE AND PAVEMENT

Delete Sec 401.4.5 and substitute the following: ***10/16***

401.4.5 Moisture Susceptibility. When required moisture susceptibility shall be tested in accordance with AASHTO T 283. The mixture shall have a tensile strength ratio (TSR) of 70 percent or greater when compacted to 3.7 inches with 7 +/- 0.5 percent air voids. An approved anti-strip additive may be added to increase retained strength to a passing level. When testing is required by Sec 401.2.1 or 401.9, the mixture shall be tested during production in accordance with Sec 403.19.

Delete Sec 401.5 and substitute the following: ***10/16***

401.5 Gradation and Deleterious Content Control. The engineer shall be notified as soon as possible, but no later than 24 hours if a change is made to the cold feed settings, hot bin settings or the binder content. The contractor shall determine the mixture gradation at the frequency stated in Sec 401.8.1. The mixture gradation may be determined directly by using residual aggregate from the binder ignition process or by mathematical combination of the cold feed and recycled materials gradations. When the mathematical combination method is used, the RAS gradation shall be from the JMF and RAP gradation from the ignition or extraction residual aggregate. Mixtures as produced shall be subject to the following tolerances and controls:

(a) The maximum variations from the approved job-mix formula shall be within the tolerances as shown in the table below:

	Percent Passing by Weight	
Sieve Size	**Tolerance**	**Action Limit**
No. 8[a]	±5.0	± 10.0
No. 200	±2.0	± 4.0

[a] Use No. 16 sieve for BP-3

(b) The deleterious content of the material retained on the No. 4 sieve shall not exceed the limits specified in Sec 1004.2.

(c) The quantity of asphalt binder introduced into the mixer shall be the quantity specified in the job-mix formula. No changes shall be made to the quantity of asphalt binder without written approval from the engineer. The quantity of asphalt binder determined by tests on the final mixture shall not vary by more than - 0.3 to + 0.5 percent from the job-mix formula.

Delete Sec 401.7.5 and substitute the following: ***10/16***

401.7.5 Spreading. The base course, tacked or primed surface, or preceding course or layer shall be cleaned of all dirt, packed soil or any other foreign matter prior to spreading the bituminous mixture. The mixture shall be spread in the number of layers and in the quantity required to obtain the compacted thickness and cross section shown on the plans. When placing multiple layers with varying thicknesses, the thicker layer shall be placed first.

Delete Sec 401.7.8 and substitute the following: ***10/16***

401.7.8 Compaction. The compacted mixture shall have a minimum density of 92 percent of the theoretical maximum specific gravity. Density will be determined by the direct transmission nuclear method in accordance with MoDOT Test Method TM 41 or by a specific gravity method. When the contractor elects to place a lift of mixture greater than six times the nominal maximum aggregate size, cores shall be cut in half and the density of each half determined separately. In lieu of density requirements, mixtures used for wedging, transitions, existing shoulder overlays, new shoulders constructed on a sub-grade or base that does not specify density control, temporary bypasses to be maintained at the expense of the contractor, and areas where a commercial mixture is used shall be thoroughly compacted by at least three complete coverage's over the entire area with either a pneumatic tire roller weighing no less than 10 tons, a tandem-type steel wheel roller weighing no less than 10 tons or an approved vibratory roller. Rolling shall be performed at proper time intervals on each layer and shall be continued until there is no visible evidence of further consolidation.

Delete Sec 401.8.4 and substitute the following: ***10/16***

401.8.4 Pavement Testing. During construction, the engineer will designate as many tests as necessary to ensure that the course is being constructed of proper thickness, composition and density. Density of the roadway shall be determined by one core obtained by the contractor at a random location selected by the engineer for every 500 tons of production. The cores from each day's production will be averaged to determine acceptance. A joint density core shall be taken from the same transverse cross section as the mat core and alternate sides. The maximum theoretical density shown on the job mix formula shall be used for this determination. Minimum 4-inch diameter cores, shall be taken the full depth of the layer to be tested. Cores tested by AASHTO T 166 shall be in accordance with Sec 403.19.3.1.3. The contractor shall restore the surface from which samples have been taken immediately with the mixture under production or with a cold patch mixture acceptable to the engineer.

Delete Sec 401.9 and substitute the following: ***10/16***

401.9 Quality Assurance. Acceptance tests for gradation, deleterious content and asphalt content will be performed by the engineer at a minimum rate of one independent sample per 4 QC samples. A favorable comparison will be considered when a QA test is within the specification tolerances. An acceptance test for plasticity index will be performed at a minimum rate of one per project by the engineer on an independent sample taken during production. Initial testing will be performed the first week of production. When the plasticity index on an individual aggregate fraction is more than two percentage points above the value shown on the approved mix design, moisture susceptibility testing shall be required in accordance with Sec 401.4.5. At least once for every five days of production, a split of the contractor's sample will be tested. If the results of the split sample are not within five percent on all sieves above the No. 200, two percent on the No. 200, within the specification ranges on the deleterious content, and within 0.5 percent on the asphalt content from the contractor's results, another split sample will be taken jointly with the contractor and tested. If the second test results do not compare within the specification tolerances, production shall cease until the discrepancy is resolved. If the second test results compare within the above tolerances, production may continue. The engineer will retain one half of the plasticity index test and moisture susceptibility test for 7 days after testing is complete. Results of QA testing will be furnished to the contractor within 24 hours of obtaining the sample, with the exception of moisture susceptibility testing.

SECTION 413 – SURFACE TREATMENTS

Delete Sec 413.20.4.3 and substitute the following: ***04/17***

413.20.4.3 Physical Characteristics for Scrub Seal Emulsion.

Properties	Minimum	Maximum
Application rate of emulsion, gallons/sq. yard[a]	0.18	0.22
Emulsion Temperature, F	110	160
Application rate of aggregate, lb./sy[a]	16	22
Time of set prior to opening, hours[b]		2

[a]Application rate may change, final decision will be made by the engineer.
[b]The final decision for opening will be made by the engineer.

Delete Sec 413.30.5.2 and substitute the following: ***04/17***

413.30.5.2 Paver. The paver shall be capable of spraying the polymer modified asphalt emulsion membrane, applying the hot mix asphalt overlay and leveling the surface of the mat in one pass. Wheels or other parts of the paving machine shall not come in contact with the polymer modified emulsion membrane before the hot mix asphalt concrete wearing course is applied. The screed shall have the ability to crown the pavement at the center and shall have vertically adjusted extensions to accommodate the desired pavement profile.

Delete Sec 413.50.3.1 and substitute the following: ***04/17***

413.50.3.1 The engineer will mark the cracks to be sealed. Sealant shall not be placed when the pavement is wet, or when the ambient or pavement temperature falls below 40 F. The contractor shall furnish to the engineer the manufacturer's recommendations for mixing and application, including temperature restrictions, and shall prepare and apply the crack sealant in accordance with the manufacturer's recommendations.

SECTION 503 – BRIDGE APPROACH SLAB

Delete Sec 503.3 and substitute the following: ***10/16***

503.3 Construction Requirements. Concrete bridge approach slabs shall be constructed in accordance with Secs 703 and 706, and shall attain a compressive strength of 4,000 psi prior to opening to traffic. Concrete bridge approach slabs shall be textured in accordance with Sec 703. Curing shall be in accordance with Sec 502, except the liquid membrane-curing compounds shall be in accordance with Sec 1055 for bridge curing compounds. Bridge approach slabs shall require sealing with a concrete sealer.

SECTION 505 – BRIDGE DECK CONCRETE WEARING SURFACE

Delete Sec 505.20.3.1 and substitute the following: ***04/17***

505.20.3.1 The contractor shall submit a mix design to Construction and Materials meeting the following requirements:

Property	Requirement
Air Content, percent	0 to 6.5
Slump, inches	9 (max.)
Percent Fine Aggregate as percent of Total Aggregate by Absolute Volume	50 to 55
Cement Content, lbs./cubic yard min.	658
Latex Emulsion Admixture, gallons/cubic yard. min.	24.5
Net Water/Cement Ratio, max., lbs.[a] water/lbs. cement	0.40

[a] Net water shall be considered the quantity of mixing water added, plus the non-solid portion of the latex emulsion.

Delete Sec 505.30.9 and substitute the following: ***04/17***

505.30.9 Limitations of Operations. Operations shall be limited in accordance with Sec 505.10.9, except as noted herein.

Delete Sec 505.40.6.1 and substitute the following: ***04/17***

505.40.6.1 The concrete shall be volumetrically mixed at the bridge site by a continuous mixer in accordance with Sec 501. In addition to other requirements, the mixer shall provide positive control of the latex emulsion into the mixing chamber, and the latex emulsion shall calibrate to within ±2 percent of that required. The mixer shall be capable of continuously circulating the latex emulsion and have a flow-through screen between the storage tank and the discharge.

Delete Sec 505.40.10.6 and substitute the following: ***04/17***

505.40.10.6 The temperature of the latex modified high early strength concrete at time of placement shall be between 45 F and 90 F. If either the aggregate or water is heated, the maximum temperature for each shall be 100 F at the time of addition to the mix. Any method of heating during the mixing of concrete may be used provided the heating apparatus will heat the mass uniformly and avoid hot spots which will burn the material. Cement or aggregate containing lumps or crusts of hardened material or frost shall not be used.

SECTION 610 – PAVEMENT SMOOTHNESS

Delete Sec 610.4.5.1 and substitute the following: ***10/16***

610.4.5.1 Quality Control Testing. The contractor shall perform quality control (QC) testing on all eligible profiling areas and provide electronic files for smoothness data in .PFF file format to the engineer in accordance with the testing and reporting procedures in MoDOT TM-59. Reported IRI for each segment is the average of both wheel paths. Furnishing inaccurate test results may result in decertification of the inertial profiler operator. Average segment IRIs shall meet the threshold requirement in Table 1.

Delete Secs 610.4.5.3 thru 610.4.5.5 and substitute the following: ***10/16***

610.4.5.3 Areas of Localized Roughness. An area of localized roughness (ALR) is any length of pavement with a continuous 25-foot average IRI measured in the right wheel path that exceeds the maximum threshold set in Table 1. ALRs shall be corrected.

610.4.5.4 Method of Correction. Corrective action to eliminate ALRs and improve the average IRI shall be accomplished by a method approved by the engineer. Diamond grinding may be used for bumps, but the use of an impact device, such as a bush hammer, will not be permitted. Total grinding depth shall be limited to ¼ inch. Satisfactory longitudinal grinding is acceptable as the final surface of the corrected pavements. All corrective work shall be completed prior to determination of pavement thickness. The contractor shall reprofile the corrected lengths to verify smoothness compliance and submit an electronic data file in .PFF format to the engineer within 48 hours after testing.

Table 1				
Treatment Type	**Posted speed > 45 mph**		**Posted speed ≤ 45 mph**	
	Maximum Segment IRI (in/mi)	**Maximum ALR IRI (in/mi)**	**Maximum Segment IRI (in/mi)**	**Maximum ALR IRI (in/mi)**
Full Depth Pavement	80.0	125.0	80.0	175.0
Multi-Lift Overlay > 3-inches	80.0	125.0	80.0	175.0
Multi-Lift Overlays ≤ 3-inches	**Posted speed > 45 mph and AADT > 3500**		**Posted speed ≤ 45 mph or AADT ≤ 3500**	
	Maximum Segment IRI (in/mi)	**Maximum ALR IRI (in/mi)**	**Maximum Segment IRI (in/mi)**	**Maximum ALR IRI (in/mi)**
	80.0	125.0	125.0	175.0

Delete Sec 610.4.6.1 and substitute the following: ***10/16***

610.4.6.1 Quality Control Testing. The requirements are the same as Sec 610.4.5.1, except that segment average IRIs shall meet the threshold requirements for multi-lift overlays less than or equal to 3 inches in Table 1.

Delete Secs 610.4.6.3 thru 610.4.6.4and substitute the following: ***10/16***

610.4.6.3 Areas of Localized Roughness. All ALRs, defined in Sec 610.4.5.3 exceeding 175.0 inches/mile shall be corrected.

610.4.6.4 Method of Correction. Corrective action to eliminate ALRs and improve the average IRI shall be accomplished with a method approved by the engineer. Diamond grinding bumps shall only be permitted for a 1½-inch or greater single lift overlay. Grinding depth shall be limited to ¼ inch. The contractor shall reprofile the corrected lengths to verify smoothness compliance and submit an electronic data file in .PFF format to the engineer within 48 hours after testing.

Delete Secs 610.4.7.1 thru 610.4.7.2 and substitute the following: ***10/16***

610.4.7.1 Pre-Construction Quality Control Testing. Prior to performing any surface work or pavement repairs, the contractor shall profile the right wheel path in accordance with TM-59. This control profile will serve as the baseline for calculating percent improvement for the project.

610.4.7.2 Post-Construction Quality Control Testing. As soon as practical after resurfacing, the contractor shall profile the right wheel path again. The same stationing shall be used to ensure a direct comparison with the pre-construction profile.

Amend Secs 610.4.7.3 thru 610.4.7.4 to include the following: ***10/16***

610.4.7.3 Post-Construction Quality Assurance Testing. The requirements are the same as Sec 610.4.5.2, except that the testing shall only be performed in the right wheel path.

610.4.7.4 Method of Correction. Corrective action to improve the average IRI shall be accomplished with a method approved by the engineer. Diamond grinding bumps shall only be permitted for a 1 1/2-inch or greater single lift overlay. Grinding depth shall be limited to ¼ inch. The final surface texture of corrected pavement shall be comparable to adjacent sections that do not require correcting.

Delete Secs 610.5.1.1 thru 610.5.1.2 and substitute the following: ***10/16***

610.5.1.1 Smoothness Adjustment. Smoothness adjustments will be paid per segment based on the IRI before any corrections, except for the allowances in Sec 610.5.1.4. Any segment with an IRI above the maximum limit in Tables 2 and 3 must be corrected through a method approved by the engineer to achieve the desired smoothness. When paving widths are greater than the travel lane widths, incentive payment will apply to the driving lane design width only.

610.5.1.2 Incentives. Incentive payment for smoothness shall be based on either Table 2 or Table 3. Table 2 shall be used for all pavements, having a final posted speed greater than 45 mph, except multi-lift overlays less than or equal to 3 inches on routes with AADT less than or equal to 3500 and multi-treatment overlays on routes with AADT less than or equal to 3500. Table 3 shall be used for pavements having a final posted speed of 45 mph or less and multi-lift overlays less than or equal to 3 inches on routes with AADT less than or equal to 3500 and multi-treatment overlays on routes with AADT less than or equal to 3500 at any posted speed. Constant-width acceleration and deceleration lanes shall be considered as mainline pavements.

Table 2	
International Roughness Index, Inches Per Mile	**Percent of Contract Price**
40.0 or less	105
40.1 - 54.0	103
54.1 - 80.0	100
80.1 or greater	100[a]

Table 3	
International Roughness Index, Inches Per Mile	**Percent of Contract Price**
70.0 or less	103
70.1- 125.0	100
125.1 or greater	100[b]

[a]After correction to 80.0 inches per mile or less.
[b]After correction to 125.0 inches per mile or less.

Delete Sec 610.5.2.1 and substitute the following: ***10/16***

610.5.2.1 The contract price for resurfacing will be adjusted based on the improvement in profile index according to Table 4 for each segment with an initial IRI greater than 60 inches per mile. Any segment with an initial IRI less than or equal to 60 inches per mile shall receive no percent improvement price adjustment if the segment IRI after placement of the overlay is also less than or equal to 60 inches per mile. Any segment with an initial IRI less than or equal to 60 inches per mile that has an IRI greater than 60 inches per mile after placement of the overlay shall be paid at 97 percent of the contract unit price for pavement, but no correction shall be required.

Table 4	
Percent Improvement (Change in IRI / Initial IRI) X 100	**Percent of Contract Unit Price For Pavement**
35.0 or greater	103
20.0 to 34.9	100
0.0 to 19.9	97[c]

[c] After correction to 0.0 or greater

SECTION 613 – PAVEMENT REPAIR

Delete Sec 613.1 and substitute the following: ***04/17***

613.1 Description. This work shall consist of performing full depth pavement repair, partial depth pavement repair, retrofitting dowel bars, or cross stitching pavement at locations as shown on the plans or as directed by the engineer.

Delete Secs 613.3.1 thru 613.3.2 and substitute the following: ***04/17***

613.3.1 All pavement repair subsequent to sawing or removal of any pavement shall be accomplished in the same day, except as follows. If approved by the engineer, sawing may be accomplished the day before removal, but shall be repaired the following working day. Any damage caused to the pavement due to pre-sawing, such as edge spalling, shall be repaired by the contractor at the contractor's expense.

613.3.2 Repairs shall be made to only one lane at a time, unless the traffic control plan specifies otherwise. Any material that cannot be recycled shall be disposed of at a location furnished by the contractor, or at locations on the right of way approved by

the engineer. If the material is disposed of outside the right of way, an acceptable written agreement with the property owner on whose property the material is placed shall be submitted to the engineer by the contractor.

Delete Secs 613.10.2.1 thru 613.10.2.3.2.1 and substitute the following and renumber subsequent sections accordingly: 04/17

613.10.2.1 Specified areas of full depth pavement repair shall be saw cut full depth around the perimeter of the patch prior to removal, except that cuts along the shoulder line may be waived by the engineer when the pavement can be removed without damage to the shoulder. An approved saw, such as a diamond saw, shall be used for perimeter cuts. A rock saw shall not be used for a perimeter cut, but may be used to make cuts through the interior portion of the area to be removed for stress relief. The full depth of the pavement shall be removed without mechanically breaking in place, and with a minimum disturbance of sound base. Any aggregate base disturbed by the contractor shall be recompacted or removed. Unstable base aggregate shall be removed and replaced in accordance with Sec 304 as directed by the engineer. Subgrade compaction shall be performed in areas of unstable subgrade in accordance with Sec 210, if directed by the engineer. If subgrade compaction is performed, the aggregate base shall be replaced. Compaction shall be to the satisfaction of the engineer and inspection will be made visually.

613.10.2.2 All full depth pavement repairs exceeding 30 feet in length shall be constructed with tie bars along the longitudinal centerline joint in accordance with Sec 502. Dowel bars, tie bars and holes shall be as shown on the plans. Dowel bars and tie bars shall be epoxy coated. Bar holes shall be drilled to the specified diameter and to the depth shown on the plans. Equipment designed to drill multiple holes simultaneously will only be allowed provided such equipment causes no damage to existing pavement. The holes shall be blown clean and allowed to dry. The holes shall be injected with an approved epoxy or polyester bonding agent in accordance with Sec 1039.30 and shall fill the voids around the bar. The bonding agent shall be thoroughly mixed in accordance with the manufacturer's recommendations prior to injection into the holes. The bonding agent shall be injected into the hole by inserting the injection device to the back of the hole and slowly withdrawing the device while dispensing sufficient material to completely fill the void around the bar when inserted. Other methods may be used as approved by the engineer. The contractor shall use a method to prevent the bonding agent from flowing from the hole during placement of the bar and to create an effective face at the entrance of the hole. The bar shall be inserted into the hole with a twisting motion so the material in the back of the hole is forced up and around the bar. The bars shall be placed parallel to the surface and the centerline of the traveled way and shall not vary more than 1/4 inch in alignment. Bars shall be firmly seated prior to placing concrete.

613.10.2.3 All material, proportioning, air-entraining, mixing and transporting of concrete shall be in accordance with Sec 501 as applicable to pavement concrete. The concrete may contain Type III cement, calcium chloride, an accelerator or other admixtures approved by the engineer.

613.10.2.4 Construction of full depth repairs shall be in accordance with Sec 502 except as follows.

613.10.2.4.1 The concrete shall have a minimum 28-day strength of 4000 psi. The design strength shall be verified by compressive strength testing of cylinders cured under the same conditions as the full depth repair patches. For QC testing by the contractor three 4- by 8-inch or two 6- by 12-inch cylinders of concrete from a single batch shall be cast for every 250 square yards of full depth repair. For QA testing by the engineer three 4- by 8-inch or two 6- by 12-inch cylinders of concrete from a single batch shall be cast for every 1000 square yards of full depth repair or at least once per project. The compressive strength shall be the average of the cylinder breaks.

613.10.2.4.2 The concrete shall have a minimum air content of 4 percent. The air content shall be measured once for every day's production.

613.10.2.4.3 The concrete opening strength to all traffic shall be 2000 psi. The opening strength shall be verified by either compressive strength testing of cylinders in accordance with Sec 613.10.2.4.1 or the maturity method in accordance with Sec 507.

Delete Sec 613.10.2.7 and substitute the following: ***04/17***

613.10.2.8 Sawing of internal transverse and longitudinal joints and mitigation of uncontrolled cracking shall be in accordance with Sec 502.5.3.

Delete Sec 613.10.3.1 and substitute the following: ***04/17***

613.10.3.1 Measurement for full depth sawing will be made to the nearest linear foot for the combined length of perimeter diamond saw cuts and of internal transverse saw cuts at 6 foot or greater intervals.

Delete Sec 613.10.3.3 and substitute the following: ***04/17***

613.10.3.3 Measurement for furnishing and placing Portland cement concrete, will be made to the nearest 1/10 square yard.

Delete Sec 613.20.1.1 and substitute the following: ***04/17***

613.20.1.1 Class A partial depth pavement repair shall consist of repairing spalled areas or reestablishing joints or cracks in concrete pavement. Reestablishment of a joint or crack shall consist of removing concrete on each side of the joint or crack, placing a compressible insert to reestablish the joint or crack, and filling the area with Portland cement concrete, elastomeric concrete or epoxy mortar. This work shall be performed on concrete pavements that have not been resurfaced and are either not to be resurfaced as part of the contract work or the resurfacing is to be less than 3 inches thick.

Delete Secs 620.20.2.1 thru 613.20.3.1.1 and substitute the following and renumber subsequent sections accordingly: ***04/17***

613.20.2.1 Concrete coarse aggregate for Portland cement concrete shall be Gradation E or Grade F in accordance with Sec 1005 or an optimized aggregate gradation approved by the engineer. The optimized aggregate gradation shall have 100 percent passing the 3/4 inch sieve. Portland cement concrete mix shall have a minimum of 4 percent air content.

613.20.2.2 Elastomeric concrete components shall be in accordance with manufacturer recommendations. The Construction and Materials Division shall be consulted for product approval.

613.20.2.3 Epoxy mortars shall be in accordance with Sec 623.

613.20.2.4 Compressible inserts shall be rectangular and shall have a minimum thickness of 1/4 inch. The material shall be preformed fiber expansion joint filler in accordance with Sec 1057 or, if approved by the engineer, other material may be used.

613.20.2.5 Type 2, Class B liquid membrane-forming compounds, in accordance with AASHTO M 148, shall be used for curing Portland cement concrete patch material. Prior to use, the contractor shall provide to the engineer the manufacturer's certification that the curing material is in accordance with this specification. Elastomeric concrete and epoxy mortar patch materials shall be cured in accordance with manufacturer recommendations.

613.20.3 Construction Requirements.

613.20.3.1 Removal of Concrete. Repair limits shall extend beyond the delaminated or spalled area by one to two inches. Boundaries of any removal shall be kept square or rectangular. If repair areas are less than 2 feet apart, the areas shall be combined as one repair. The maximum amount of spalling allowed on the edges of the channel will be 3/8 inch. The minimum depth of removal shall be 2 inches for Portland cement concrete and according to manufacturer's recommendations for elastomeric concrete and epoxy mortar. The maximum depth of removal shall not exceed half the slab thickness. Concrete shall be removed by a milling process. Residue slurry from milling operations shall be removed in accordance with Sec 622.30.3.8. If the top of dowel bars are exposed but not structurally damaged, the exposed section of the dowel bar shall be coated with an approved bond breaker.

613.20.3.1.1 Milling. Milling equipment shall be in accordance with Sec 622.10, and shall be equipped with a device for stopping at a preset depth. Milling may be performed either across lanes or parallel to the pavement centerline. After milling, the bottom of the repair area shall be checked by sounding to ensure all unsound material has been removed. Any unsound material remaining shall be chipped free. All transverse sides of the removal shall be uniform and tapered 30° to 60° from vertical by milling or chipping. If excessive concrete is removed, or dowel bars are damaged to the extent to require full depth pavement repair, the cost for the repair shall be at the contractor's expense.

Delete Sec 613.20.3.2 and substitute the following: ***04/17***

613.20.3.2 Cleaning. The exposed faces of the concrete shall be free of loose particles, oil, dust, traces of bituminous material and any other contaminants before repair material is placed. The procedure shall produce a clean, roughened surface, such as can be produced by sandblasting or, shotblasting. All residue shall be removed with air blasting equipment just prior to placement of material. The air from the air blasting equipment shall be free of contaminants.

Delete Sec 613.20.3.3.1 and substitute the following: ***04/17***

613.20.3.3.1 Transverse Joints and Cracks. When placing a partial depth pavement repair directly against a transverse joint or crack, a compressible insert shall be placed against the joint or crack to form a bond breaker between the patch material and joint or crack. A pliable material shall be used to reform cracks along the existing paths. The new joint or crack shall be formed to the same width as the existing joint or crack. The compressible insert shall be placed into the existing joint to a minimum depth of one inch below the bottom of the repair and shall extend a minimum of one inche beyond each end of the prepared repair boundaries.

Delete Sec 613.20.3.3.4 and substitute the following: ***04/17***

613.20.3.3.4 Reestablishment of Joint and Cracks. At locations where repairs include existing pavement joints, both longitudinal and transverse, the initial reestablishment of the joint in the plastic concrete shall be accomplished with an approved preformed joint filler and shall be made to the same width as the existing joint. Existing cracks shall be reestablished using a compressible insert of a width equal to the existing crack width, except the insert shall be no less than 1/4 inch thick. The material insert shall be placed into the existing joint or crack to a minimum depth of one inch below the bottom of the repair, shall extend the full length of the joint or crack and shall extend to the top of the proposed pavement profile. The material shall prevent the concrete from flowing into the existing joint or crack. Sawing to reestablish the joint or crack will not be permitted.

Delete Secs 620.20.3.4.1.1 thru 613.20.3.6 and substitute the following and renumber subsequent sections accordingly: 04/17

613.20.3.4.1.1 For Portland concrete, Type II or Type III epoxy resin material in accordance with Sec 1039 or grout shall be used. When epoxy material is used, the concrete shall be placed while the epoxy is still tacky. If the epoxy sets prior to placement of the concrete, the hardened epoxy material shall be removed and the pavement repair area shall be cleaned in accordance with Sec 613.20.3.2. When grout is used, mortar shall be in accordance with Sec 1066, except it shall consist of equal parts of cement and sand. If the grout dries prior to placing the concrete, the dried or hardened grout shall be removed and the pavement repair area shall be cleaned in accordance with Sec 613.20.3.2.

613.20.3.4.1.2 For elastomeric concrete, the bonding material properties and application shall be in accordance with manufacturer recommendations.

613.20.3.4.1.3 For epoxy mortar, a neat low viscosity epoxy in accordance with Sec 623.20 shall be used.

613.20.3.4.2 Placement of Repair Material. Epoxy mortar shall not be used to repair spalls caused by reinforcing steel corrosion. No standing water shall be present at the time of placement of the material. Retempering of the Portland cement concrete mixture with water will not be permitted. Concrete material shall be placed into the channel and consolidated with a small spud vibrator. Vibrators with diameters greater than one inch will not be permitted. Care shall be taken not to touch the compressible insert with a vibrator. On very small repairs and as approved by the engineer, hand tools may be used to work the repair material and attain adequate consolidation. Elastomeric concrete shall be handled, prepared and mixed in accordance with manufacturer recommendations. Epoxy mortar components shall be handled, prepared and mixed in accordance with Sec 623. Any segregated areas shall be removed and replaced at the contractor's expense.

613.20.3.4.3 Finishing and Texturing. Repair material shall be finished to match the cross section of the existing pavement. The repair material shall be screed from the center of the repair out to the repair boundaries. Excess patch material from finishing may be used to fill any saw cut run-outs that extend beyond the repair perimeter, if the material can fully penetrate the run-outs, otherwise, an approved low viscosity epoxy shall be used to fill the saw cut run-outs. After finishing, the repair shall be appropriately textured to approximate the texture of the existing pavement.

613.20.3.4.4 Sealing and Curing. For Portland cement concrete patch material the repair and slab interface shall be sealed by painting the repair perimeter with a 1:1 cement-water grout. Concrete repair material shall be cured in accordance with Sec 502.6.1, except a double application of curing material in accordance with Sec 613.20.2.5 shall be placed over the repaired area. Elastomeric concrete shall be cured in accordance with manufacturer recommendations. Epoxy mortar shall be cured in accordance with Sec 623.

613.20.3.5 Opening to Traffic. Traffic shall not be permitted on the repaired pavement until the patch material has attained a minimum compressive strength of 1,600 psi, but shall be a minimum of two hours after placement or the time recommended by the manufacturer.

613.20.3.6 Acceptance. All pavement repairs will be sounded by the engineer prior to acceptance. Sounding will not be performed until the repair material has reached design compressive strength and the repair has been open to traffic for a minimum of 30 days. If sounding indicates unsound material, the entire pavement repair shall be removed to the limits designated by the engineer and replaced by the contractor at the contractor's expense.

Delete Sec 613.30.2 and substitute the following: ***04/17***

613.30.2 Material. The material used for Class B partial depth pavement repairs shall be either the bituminous surface mix specified in the contract for resurfacing the existing pavement or a bituminous commercial mix in accordance with Sec 401.5.3 Tack material shall be in accordance with Sec 407.2.

Delete Sec 613.30.3.1.1 and substitute the following: ***04/17***

613.30.3.1.1 At areas shown on the plans or where unsuitable material is exposed during coldmilling operations and identified by the engineer to be repaired, all loose and unsuitable bituminous material shall be removed by milling or other approved methods. Concrete material shall be removed in accordance with Sec 613.20.3.1. Around the perimeter of the repair, the sides shall be relatively vertical, and concrete surfaces shall have a roughened face, such as can be produced by milling or other means approved by the engineer. The minimum depth of the repair shall be 2 inches. The area shall be cleaned to remove loose material and shall have a relatively uniform depth. If the top of dowel bars are exposed but not structurally damaged, the exposed section of the dowel bar shall be coated with an approved bond breaker.

Delete Secs 613.30.3.2 thru 613.30.3.3 and substitute the following: ***04/17***

613.30.3.2 Cleaning. The exposed faces of the concrete shall be free of loose particles, dust and any other contaminants before repair material is placed. The procedure shall produce a clean, roughened surface, such as can be produced by sandblasting, shotblasting or high pressure water blasting. All residue shall be removed with air blasting equipment just prior to placement of material. The air from the air blasting equipment shall be free of contaminants.

613.30.3.3 Placement of Repair Material. The repair area shall be suitably tacked on the sides and bottom to ensure bonding of any remaining loose material, as well as bonding of the repair material. There shall be no ponding of the tack liquid at the time the area is filled. The repair area shall be filled with an approved bituminous surface mixture, and thoroughly compacted over the entire repair area to a density approved by the engineer. Areas greater than 3 inches in depth shall be filled in two lifts, each thoroughly compacted. Reestablishing of joints by sawing will not be required.

Delete Sec 613.30.5 and substitute the following: ***04/17***

613.30.5 Basis of Payment. The accepted quantities for Class B partial depth pavement repair will be paid for at the contract unit price for each of the pay items included in the contract. Payment for tack liquid is incidental to the pay item for furnishing and placing bituminous material. Full depth pavement repairs required due to improper means and methods by the contractor will be at the contractor's expense. All other full depth pavement repairs will be paid for in accordance with Sec 613.10.

Delete Sec 613.35.1 and substitute the following: ***04/17***

613.35.1 Description. Class C partial depth pavement repair shall consist of performing repairs in asphalt pavements, including composite pavements that have an asphalt surface. This work includes removal of unsound pavement to the depth specified on the plans, or as directed by the engineer, and replacement with an approved asphalt mixture.

Delete Sec 613.35.5 and substitute the following: ***04/17***

613.35.5 Basis of Payment. The accepted quantities for Class C partial depth pavement repair will be paid for at the contract unit price of the pay items included in the contract. Payment for tack liquid is incidental to the pay item for furnishing and placing bituminous material.

Delete Sec 613.40.2.1 and substitute the following: ***04/17***

613.40.2.1 Repair Material. Rapid set concrete patching material shall be used. The maximum aggregate size in the gradation shall be 1/2-inch. Prior to use, the material shall be approved by the engineer. Material having completed current testing through AASHTO's NTPEP will be considered for qualification upon submittal of a written request by the manufacturer with accompanying documentation. The material shall be handled, prepared and mixed in accordance with the manufacturer's recommendations. The contractor shall supply a manufacturer's certification to the engineer for each lot of material furnished. Certification shall include the name of the manufacturer and a manufacturer's certification statement that the material supplied is the same as the material that was qualified.

Delete Sec 613.40.2.4 and substitute the following: ***04/17***

613.40.2.4 Joint Insert. To re-establish the crack, a compressible insert, in accordance with Sec 613.20.2.4, shall be used. The material shall fit tight around the dowel bar and to the bottom and edges of the slot. The material shall be capable of remaining in a vertical position and tight to all edges during placement of the repair material to prevent the concrete backfill from flowing into the existing crack and pavement voids.

Delete Sec 613.40.3.1 and substitute the following: ***04/17***

613.40.3.1 Preparation of Slots. Two saw cuts shall be made in the pavement to outline the longitudinal sides of each dowel bar slot. The slots shall be sawed to a depth and length that allows the center of the dowel to be placed at mid-depth in the pavement slab. The slots shall be 2 1/2 inches wide. The contractor shall provide a method, approved by the engineer, that will align the

slots parallel to centerline of the roadway with a maximum variation of 1/8 inch from a true parallel line. Slots in a wheel path shall be created by using saws with gang-mounted diamond blades, capable of simultaneously making six saw cuts for three dowel bar slots at the desired slot spacing. Equipment shall not cause damage to the existing pavement. All saw slurry shall be removed from the slot and pavement. No water residue or paste shall be allowed to flow onto lanes open to traffic or into closed drainage systems. If pneumatic hammers or other equipment used during concrete removal operations cause damage to pavement that is to remain, the concrete removal operations shall be discontinued and shall not resume until the contractor has taken corrective measures. The pneumatic hammer will not be permitted to break through the concrete, and if this occurs, a full depth pavement repair shall be conducted at the contractor's expense. The bottom of slots shall be flat. The edges of the slots shall be cleaned by sandblasting to produce a rough surface. Blasting operations shall not damage the surrounding pavement. The newly exposed concrete surface shall be free of spalls, burrs, latence and all contaminants detrimental to achieving an adequate bond. The maximum amount of spalling allowed on the edges of the slots will be 3/8 inch. The point of curvature at the bottom of either end of the slot shall be ½ inch beyond the dowel bars end.

Delete Secs 613.40.3.1.2 thru 613.40.3.1.3 and substitute the following: ***04/17***

613.40.3.1.2 Multiple saw cuts parallel to the centerline within the slot removal boundaries may be sawed to allow removal of material from the dowel bar slots and to provide a level surface for the feet of the dowel bar chairs.

613.40.3.1.3 All slots shall be cleaned with moisture-free, oil-free, compressed air to remove any remaining dust, residue, debris and moisture. The contractor shall then seal the existing transverse joint and all cracks at the bottom and the sides of the dowel bar slot with a silicone sealant to prevent any repair material from entering into these areas.

Delete Sec 613.40.3.2.1 and substitute the following: ***04/17***

613.40.3.2.1 Prior to inserting a dowel bar in a slot, expansion caps shall be placed on each end of the bar. A minimum ¼ inch gap shall be maintained in the expansion caps. A dowel bar chair shall hold the bar firmly centered in the slot and at a minimum of 1/2 inch above the bottom of the dowel slot. The dowel bar chairs shall not allow movement of the dowel.

Delete Sec 613.40.3.2.4 and substitute the following: ***04/17***

613.40.3.2.4 A joint insert shall be placed into the slot as a filler material to maintain the crack as shown on the plans. When in place, the insert shall extend from the bottom of the slot to the surface of the pavement, with half the dowel length extending on each side of the insert. If for any reason the insert or dowel bars shift during placement of the repair material, the work will be rejected and shall be redone at the contractor's expense.

Delete Sec 613.40.3.3 in its entirety and renumber subsequent section accordingly: ***04/17***

SECTION 616 – TEMPORARY TRAFFIC CONTROL

Delete Sec 616.11 and substitute the following: ***10/16***

616.11 Basis of Payment. All temporary traffic control devices authorized for installation by the engineer will be paid for at the contract unit price for each of the pay items included in the contract. No direct payment will be made for the following:

(a) Incidental items necessary to complete the work, unless specifically provided as a pay item in the contract.

(b) Installing, operating, maintaining, cleaning, repairing, removing or replacing traffic control devices.

(c) Covering and uncovering existing signs and other traffic control devices.

(d) Relocating temporary traffic control devices, including permanent traffic control devices temporarily relocated, unless specifically included as a pay item in the contract.

(e) Worker apparel.

(f) Flaggers, AFADs, PFDs, pilot vehicles, and appurtenances at flagging stations.

(g) Furnishing, installing, operating, maintaining and removing construction-related vehicle and equipment lighting.

(h) Construction and removal of temporary equipment crossovers, including restoring pre-existing crossovers.

(i) Provide and maintaining work zone lighting and work area lighting.

SECTION 620 – PAVEMENT MARKING

Delete Secs 620.60.3.1.1 thru 620.60.3.1.2 and substitute the following: ***10/16***

620.60.3.1.1 Type 1 Temporary RPM's, with covers, shall be used for Seal Coat as defined in Sec 409 and for surface treatment projects as defined in Sec 413 with the exception of Sec 413.30. When used for other than surface treatment projects, Type 1 Temporary RPM's, with no covers, may be used as shown on the plans.

Delete Sec 620.60.3.1.2 in its entirety: ***04/17***

SECTION 623 – CONCRETE BONDING COMPOUND, EPOXY MORTAR AND EPOXY POLYMER CONCRETE OVERLAY

Delete Sec 623.30.3.4 and substitute the following: ***01/17***

623.30.3.4 Surface Preparation. Before placement of the overlay, the entire deck surface shall be prepared by the cleaning practice established in the field adhesion strength tests in accordance with Sec 623.30.3.3, except that sand blasting will not be permitted.

Delete Sec 623.30.3.6 and substitute the following: ***01/17***

623.30.3.6 Epoxy Mixture. Mixing of epoxy components shall be in accordance with the manufacturer's recommendations, except that the use of a volumetric mixer will be required. When mineral fillers are specified, the mineral fillers shall be inert and non-settling or readily dispersible. Material showing a permanent increase in viscosity or the settling of pigments that cannot be readily dispersed with a paddle shall be replaced at the contractor's expense. At least 95 percent of the filler shall pass the No. 200 sieve.

Delete Sec 623.30.7.2 and substitute the following: ***01/17***

623.30.3.7.2 The overlay shall consist of a two-course application of epoxy and aggregate. A prime coat shall be used if recommended by the manufacturer. Each of the two courses shall consist of a layer of epoxy covered with a layer of aggregate in sufficient quantity to completely cover the epoxy. The thickness of each course shall be approximately equal. The total thickness of the overlay shall be no less than 1/4 inch.

SECTION 627 – CONTRACTOR SURVEYING AND STAKING

Delete Sec 627.2.3 and substitute the following: ***01/17***

627.2.3 The engineer will furnish and set control points with known coordinates. The engineer will furnish all coordinate data to lay out the job and locate benchmarks as shown on the plans. The contractor shall provide all other staking necessary for the successful prosecution of the work, including all staking necessary to facilitate the relocation of utilities. All alignment control established by the contractor shall be referenced, and a copy of the references shall be furnished to the engineer.

SECTION 701 – DRILLED SHAFTS

Delete Sec 701.4.10.3.3 and substitute the following: ***01/17***

701.4.10.3.3 Shaft Inspection. Inspection of a shaft by television camera shall be performed as directed by the engineer. The excavated shaft, including the rock socket when applicable, shall be thoroughly cleaned of all loose fragments, sediment and turbidity prior to inspection. The camera shall be operated such that optimum clarity of detail can be obtained and all surface areas of the shaft, including the rock socket and the rock socket's base, can be observed. All scanning of the rock surfaces shall be recorded. After completion of the inspection of a rock socket, the engineer will direct whether or not drilling of the shaft shall be continued to a greater depth. Recordings shall be furnished to and shall become the property of the engineer upon completion of the work.

SECTION 703 – CONCRETE MASONRY CONSTRUCTION

Delete Sec 703.3.8 and substitute the following: ***10/16***

703.3.8 Surface Sealing for Concrete. Bridge decks shall be sealed with one application of an approved penetrating concrete sealer in accordance with Sec 1053. The penetrating concrete sealer shall also be applied to the top surface of the concrete bridge approach slabs, top and roadway faces of sidewalks, curbs, parapets, medians and barriers. The surfaces of deck patching shall not be sealed unless the surface of the rest of the deck is being sealed. The surface of a Latex Modified Concrete overlay shall not be sealed. The surface of all other dense concrete overlays shall be sealed.

SECTION 704 – CONCRETE MASONRY REPAIR

Delete Secs 704.1 thru 704.2 and substitute the following: ***01/17***

704.1 Description. This work shall consist of removing deteriorated concrete, preparing the repair site, forming where required, placing and finishing new concrete or qualified special mortar, applying epoxy and applying concrete crack filler in the required areas.

704.2 Material. All material shall be in accordance with Division 1000, Material Details, and specifically as follows. The qualified special mortar shall be from the qualified rapid set concrete patching material listing available from Construction and Materials or MoDOT's website.

Item	Section
Concrete	501
Concrete Bonding Compound and Epoxy Mortar	623
Gradation E Coarse Aggregate	1005
Type III Cement	1019
Type III Epoxy & Epoxy Polymer Concrete Overlay	1039
Concrete Crack Filler	1053
Water	1070

Delete Sec 704.3.10 and substitute the following: ***01/17***

704.3.10 Concrete Crack Filler. This work shall consist of applying a concrete crack filler to the concrete in the required areas.

Delete Sec 704.4.2.3 and substitute the following: ***01/17***

704.4.2.3 Concrete Crack Filler Preparation. The area to fill the cracks shall be cleaned by pressure washing with at least 2500 psi, 3 days minimum prior to the crack filler application and 2 days after any measurable precipitation.

Delete Sec 704.4.3.1 and substitute the following: ***01/17***

704.4.3.1 Applying Concrete Crack Filler. The area to fill the cracks shall be filled with a low viscosity polymer crack filler. The concrete crack filler application and rate of coverage shall be in accordance with the manufacturer's recommendations, with a maximum coverage of 100 square feet per gallon. The broadcasting of dry blasting sand shall be applied only as approved by the engineer, in accordance with the manufacturer's written recommendations with a maximum coverage of 1 to 2 lbs/sq.yd. starting approximately 10 minutes after crack filling operation has started.

Delete Sec 704.5.5 and substitute the following: ***01/17***

704.5.5 Filling concrete cracks will be measured to the nearest square foot.

SECTION 706 – REINFORCING STEEL FOR CONCRETE STRUCTURES

Delete Sec 706.3.3.4 and substitute the following: ***01/17***

706.3.3.4 For mechanical bar splice systems that require laps with the reinforcement, the minimum lap length in inches on each side of the joint shall be as shown in the tables below provided that the actual cover to the nearest concrete surface or actual bar spacing is no less than minimums shown.

Minimum Lap Lengths										
	Location 1 - Horizontal and Inclined Bars with more than 12 inches of fresh concrete cast below bars				Location 2 - Vertical Bars - Horizontal and Inclined Bars with 12 inches or less of fresh concrete cast below bars					
	f'c = 3 ksi		f'c = 4 ksi		f'c = 3 ksi		f'c = 4 ksi		Minimums (Inches)	
Bar Size	Plain	Epoxy Coated	Plain	Epoxy Coated	Plain	Epoxy Coated	Plain	Epoxy Coated	Cover	Spacing
4	29	37	25	32	22	33	19	29	1½	2½
5	36	46	31	40	28	41	24	36	1⅞	3⅛
6	43	56	37	48	33	49	29	43	2¼	3¾
7	50	65	43	56	38	57	33	50	2⅝	4⅜
8	57	74	49	64	44	65	38	57	3	5
9	64	83	55	72	49	74	43	64	3½	5¾
10	72	94	62	81	55	83	48	72	3⅞	6⅜
11	80	104	69	90	61	92	53	80	4¼	7⅛
Values are LRFD Class B splices based on the following modification factors: λ_{rl} = 1.3 (Location 1), λ_{rl} = 1.0 (Location 2), λ_{cf} = 1.0 (Plain), λ_{cf} = 1.5 (Epoxy), λ_{rc} = 0.4 (Minimum reinforcement confinement factor)										

Amend Secs 706.3.3.4.1 thru 706.3.3.4.2 to include the following: ***01/17***

706.3.3.4.1 For reinforcement with cover or spacing less than required minimums shown in the table provided in Sec 706.3.3.4, the required minimum lap length in the table shall be multiplied by the reinforcement confinement adjustment ratio, B.

$$B = \frac{d_b}{0.4c_b}$$, if B > 2.5, then B = 2.5

where: d_b = diameter of bar (inches)

c_b = the smaller of the distance from center of bar to the nearest concrete surface and one half the center-to-center spacing of the bars (inches)

706.3.3.4.2 Mechanical bar splice systems that require laps with the reinforcement shall not be used for voided slab and solid slab bridges. Systems that require laps shall be Grade 60 deformed bars in accordance with Sec 1036. Epoxy-coated bars shall have epoxy-coated mechanical bar splices.

SECTION 717 – FLEXIBLE JOINT SYSTEMS

Delete Sec 717 title and substitute the following: ***1/17***

SECTION 717

FLEXIBLE JOINT SYSTEMS

Delete Sec 717.20.4 and substitute the following: ***01/17***

717.20.4 Method of Measurement. Final measurement will not be made except for authorized changes during construction, or where appreciable errors are found in the contract quantity. Where required, the strip seal will be measured to the nearest linear foot, based on measurement from the roadway face of curb to roadway face of curb along the centerline of the joint. The revision or correction will be computed and added to or deducted from the contract quantity. Portions of the joint that extend past the roadway face of curbs will not be measured for payment.

Amend Secs 717.50 thru 717.60.5 to include the following: ***1/17***

SECTION 717.50 OPEN CELL FOAM JOINT.

717.50.1 Description. This work shall consist of furnishing and installing an open cell foam joint system as shown on the plans, as directed by the engineer and in accordance with the manufacturer's requirements.

717.50.2 Material. All material shall be in accordance with Division 1000, Material Details, and specifically as follows:

Item	Section
Open Cell Foam Joints	1073

717.50.3 Construction Requirements. The contractor shall have a manufacturer's representative on site for the joint installation. The representative shall be responsible for ensuring the surface preparation and joint installation are done in accordance with the manufacturer's requirements.

717.50.3.1 Field Splices. The Open Cell Foam shall be installed in one continuous piece without field splices, unless otherwise specified on the plans or directed to by the engineer. Open Cell Foam shall be spliced with silicone called for in Sec 1057 and in accordance with the manufacturers recommendations.

717.50.4 Method of Measurement. Final measurement will not be made except for authorized changes during construction or where significant errors are found in the contract quantity. Where required, the open cell foam joint will be measured to the nearest linear foot based on measurement from roadway face of curb to roadway face of curb along the centerline of the joint. The revision or correction will be computed and added to or deducted from the contract quantity. No measurement will be made of portions of the joint that extend past the roadway face of curbs.

717.50.5. Basis of Payment. Open cell foam joint, including all material, coating, equipment, labor, fabrication, installation and any other incidental work necessary to complete this work, will be paid for at the contract unit price for Open Cell Foam Joint.

SECTION 717.60 PREFORMED SILICONE OR EPDM EXPANSION JOINTS.

717.60.1 Description. This work shall consist of furnishing and installing a preformed silicone or EPDM expansion joint seal for joints as shown on the plans or as directed by the engineer and in accordance with the manufacturer's requirements.

717.60.2 Material. All material shall be in accordance with Division 1000, Material Details, and specifically as follows:

Item	Section
Preformed Silicone or EPDM Expansion Joints	1073

717.60.3 Construction Requirements. The contractor shall furnish to the engineer the manufacturer's written product information, installation procedures and instructional information at least two weeks prior to installation. The contractor shall obtain the services of a qualified technical representative approved by the manufacturer of the expansion joint seal and acceptable to the engineer, to assist during the installation. The contractor, the technical representative and the engineer shall meet to review and clarify installation procedures and requirements prior to starting the work. The start of surface preparations and seal installation shall not occur without the technical representative being present. The technical representative shall be present for at least one day at the start of surface preparations and seal installation.

717.60.3.1 Surface Preparation. The concrete or steel surface shall be prepared for priming and seal placement. New Portland cement concrete shall be fully cured and allowed to dry a minimum of seven days. The joint shall be cleaned of all gravel, loose material and other contaminates before sand blasting. Areas that will be in contact with the sealant shall be sand blasted with a clean, hard aggregate that will leave little to no dust residue. Sand blasted concrete surfaces will be considered acceptable when areas that will be in contact with the sealant have a roughened surface with clean, exposed aggregate. The surface shall be free of foreign matter or plastic residue. Sand blasted steel surfaces will be considered acceptable when the steel surfaces have been cleaned to an SSPC-SP10 degree of cleanliness. After sand blasting is completed, the joint shall be cleaned of debris using oil-free and water-free compressed air or a vacuum, either being at least 90 psi. Using a rag saturated in denatured alcohol, wipe clean both vertical faces of the expansion joint opening.

717.60.3.2 Priming. Priming shall immediately follow sand blasting and cleaning and will only be permitted to proceed when the air and substrate temperatures are at least 40° F and rising. Sand blasting, priming and installing the seal shall be performed on the same day. The entire sand blasted surface shall be primed. Application and drying times for primers shall be in accordance with the manufacturer's recommendations. All leftover primer shall be properly disposed.

717.60.3.3 Installation. The preformed silicone or EPDM expansion joint seal shall be installed in joints in one continuous piece without field splices. The locking adhesive and seal shall be applied in accordance with the manufacturer's recommendations, in a manner that prevents the seal from being damaged and from being in tension. Twisting, curling and nicking the seal will be

prohibited. Unless the installation tool is capable of installing the seal without elongation prior to placement, the seal shall be pre-cut to the exact length for the joint plus ends as shown in the contract documents or as directed by the engineer. The pre-cut seal shall be installed and measured for stretch. The seal shall be removed and reinstalled if the seal stretch length exceeds five percent of the pre-cut length at the contractor's expense.

717.60.4 Method of Measurement. Final measurement will not be made except for authorized changes during construction or where significant errors are found in the contract quantity. Where required, the preformed silicone or EPDM expansion joint will be measured to the nearest linear foot based on measurement from roadway face of curb to roadway face of curb along the centerline of the joint. The revision or correction will be computed and added to or deducted from the contract quantity. No measurement will be made of portions of the joint that extend past the roadway face of curbs.

717.60.5. Basis of Payment. Preformed silicone or EPDM expansion joint, including all material, coating, equipment, labor, fabrication, installation and any other incidental work necessary to complete this work, will be paid for at the contract unit price for Preformed Silicone or EPDM Expansion Joint.

SECTION 903 – HIGHWAY SIGNING

Delete Sec 903.6.1 and substitute the following: ***10/16***

903.6.1 Breakaway assemblies for pipe posts and structural steel posts, including the base connection, hinge plate, fuse plate, structural bolts and all other fabrication, complete in place, are incidental, regardless of the post size or shape. Breakaway assemblies for perforated square steel tube posts, complete in place, will be paid for at the contract unit price each, regardless of the post size.

SECTION 1032 – PRECAST CONCRETE FLARED END SECTIONS

Amend Sec 1032.2.1 to include the following: ***10/16***

1032.2.1 Steel Fibers. Steel fibers shall be in accordance with ASTM A820. The PAL process as outlined in Sec 106 shall apply to steel fibers used in flared end sections.

Delete Secs 1032.3 thru 1032.4.2 and substitute the following: ***10/16***

1032.3 Design.

1032.3.1 Standard Reinforcement. Flared end sections, utilizing rebar or cold drawn steel wire shall be in accordance with the Missouri Standard Plans for Highway Construction.

1032.3.2 Steel Fibers. Steel fibers may be used exclusively or in combination with standard reinforcement. When steel fibers are used, the amount of steel fibers and standard reinforcement required shall be determined through proof of design testing accordance with ASTM C1765, Section 9, for Class III pipe of the same diameter. Proof of design testing shall be performed every three years and the results provided to the engineer upon request. Additional proof of design testing shall be performed when the type of steel fiber is changed or when the dosage rate of the steel fibers is changed.

1032.4 Basis of Acceptance.

1032.4.1 Acceptance Criteria. Acceptability of end sections for all diameters will be determined by the results of such material tests as required in Sec 1026.3, by crushing tests on concrete cores or cured concrete cylinders, and by inspection of the finished end sections, including quantity and placement of reinforcement, to determine the conformance with the design and the freedom from defects.

1032.4.2 Workmanship. All protruding steel fibers shall be removed from the flared end prior to shipping.

SECTION 1042 – HIGHWAY SIGN MATERIAL

Delete Sec 1042.2.7.2 and substitute the following: ***10/16***

1042.2.7.2 Background sheeting applied to flat sheet and extruded panel signs shall be in accordance with ASTM D 4956 Type IV, Class 1. All yellow, orange and yellow green sheeted signs shall be fabricated with ASTM D 4956 Type IX, XI or AASHTO

M 268 Type C or D fluorescent yellow, fluorescent orange and fluorescent yellow green sheeting respectively. Retroreflective sheeting shall be high intensity that is an unmetallized micro prismatic reflective material.

Delete Secs 1042.2.10 thru 1042.2.10.1 and substitute the following: ***10/16***

1042.2.10 Type of Characters. Letters, numerals, arrows, symbols, borders and other features of the sign message shall be of the type, size and series shown on the plans or as specified by the engineer. Completed letters, numerals and other units shall be formed to provide a continuous stroke width with smooth edges, and shall yield a flat surface free of air bubbles, wrinkles or other blemishes as determined by the engineer. Units of the sign message shown on the plans shall meet the requirements for the specified type.

1042.2.10.1 Screen Print, Transparent Overlay and Opaque Black Film.

Delete Sec 1042.2.10.2 and substitute the following: ***10/16***

1042.2.10.2 Direct Applied Characters. The letters, numerals, symbols, borders and other features of the sign message shall be cut from the color and type of sheeting shown on the plans, and applied to the sign field in accordance with the sheeting manufacturer's recommendations.

SECTION 1048 – PAVEMENT MARKING MATERIAL

Delete Sec 1048.50.2 and substitute the following: ***10/16***

1048.50.2 Type 1 Temporary Raised Pavement Markers. Markers shall consist of an L-shaped or T-shaped flexible polymer body with a minimum of 6.0 square inches of ASTM Type V reflective sheeting on both faces of the vertical section. The marker base shall have affixed a pressure-sensitive adhesive, protected by a release paper, for application to the pavement surface. A protective sleeve that prevents contamination of the reflective sheeting during pavement surface treatment operations shall be affixed to each marker in a minimum of two locations. The protective sleeve shall be easily removable after the surface treatment operation is complete.

Delete Sec 1048.50.3 in its entirety: ***04/17***

SECTION 1053 – CONCRETE SEALER AND CONCRETE CRACK FILLER

Delete Sec 1053 title and substitute the following: ***1/17***

SECTION 1053

CONCRETE SEALER AND CONCRETE CRACK FILLER

Amend Sec 1053.10 to include the following and renumber subsequent sections accordingly: ***1/17***

SECTION 1053.10 PENETRATING CONCRETE SEALER

Delete Sec 1053.2 and substitute the following: ***01/17***

1053.10.2 Acceptance. All material under this specification shall be obtained from a source identified on the PAL designated for this specification. All material under this specification will be inspected and accepted in accordance with Sec 106. ASTM and AASHTO specifications, when referenced, control only the physical and chemical properties of the material.

Delete Sec 1053.3 in its entirety and renumber subsequent sections accordingly: ***01/17***

Amend Sec 1053.10.4 to include the following: ***1/17***

1053.10.4 Manufacturer and Brand Name Approval. Prior to approval and use of concrete sealers, the manufacturer shall submit to Construction and Materials a certified test report from an approved testing laboratory showing specific test results conforming to the requirements of these specifications. The certified test report shall also contain the manufacturer's name, product brand name, lot number and date of manufacture. Upon approval of the certified test report by the engineer the manufacturer and brand name will be added to the PAL designated for this specification. New certified test results shall be

submitted any time the manufacturing process or the sealer formulation is changed, and may be required by the engineer when sampling and testing of material offered for use indicates nonconformance to any of the requirements herein specified.

Amend Secs 1053.20 thru 1053.20.5 to include the following: ***1/17***

SECTION 1053.20 CONCRETE CRACK FILLER

1053.20.1 Scope. This specification covers concrete crack fillers for the protection of concrete against damage from de-icing chemicals.

1053.20.2 Acceptance. All material shall be obtained from a source identified on the PAL designated for this specification, except as otherwise listed below. All materials under this specification will be inspected and accepted in accordance with Sec 106.

1053.20.3 The concrete crack filler shall be a low viscosity polymer. The chemical composition shall meet the following requirements:

Property	Test Method	Specification
Viscosity	AASHTO D-2393	Less than or equal to 25 cps
Gel Time	AASHTO T-237	Less than or equal to 20 minutes @ 70 deg F
Tensile Strength	ASTM D638	Greater than or equal to 1500 psi
Elongation	ASTM D638	Greater than or equal to 5%
Solids Content		Greater than or equal to 95%
Flash Point	ASTM D1310	Greater than or equal to 50 deg F
Cure Rate	AASHTO T-237	Less than or equal to 3 hrs @ 70 deg F

1053.20.4 The concrete crack filler shall meet the procedures and the application rates as specified in Sec 704. MoDOT reserves the right to verify any qualification tests at their expense on any field application.

1053.20.5 Manufacturer and Brand Name Approval. Prior to approval and use of concrete crack fillers, the manufacturer shall submit to Construction and Materials a certified test report from an approved testing laboratory showing specific test results conforming to the requirements of these specifications. The certified test report shall also contain the manufacturer's name, product brand name, lot number and date of manufacture. Upon approval of the certified test report by the engineer the manufacturer and brand name will be added to the PAL designated for this specification. New certified test results shall be submitted any time the manufacturing process or the crack filler formulation is changed, and may be required by the engineer when sampling and testing of material offered for use indicates nonconformance to any of the requirements herein specified.

SECTION 1065 – DELINEATORS

Delete Sec 1065.2 in its entirety and renumber subsequent sections accordingly: ***01/17***

Delete Sec 1065.2 and substitute the following: ***01/17***

1065.2 Delineator Body. The delineator body shall be flat sheet aluminum in accordance with Sec 1042 and dimensions as shown on the plans.

SECTION 1073 – JOINT MATERIAL FOR STRUCTURES

Amend Secs 1073.6 thru 1073.7.3 to include the following and renumber subsequent sections accordingly: ***1/17***

1073.6 Open Cell Foam Joint System. All components of the system shall be supplied by one manufacturer. The joint system shall be comprised of the following components.

(a) Cellular polyurethane foam impregnated with 100% hydrophobic polymer, water based emulsion and factory coated, on the roadway surface, with highway-grade, fuel resistant silicone.

(b) Field-applied epoxy adhesive primer.

(c) Field-applied silicone sealant bands that seal the gap between the edge of the bridge and the silicone topping on the joint. This silicone will also be used for locking field splices in the joint together.

1073.6.1 General Movement Requirements. The seal shall have a working range of 50% in tension and 50% in compression. Changes in plane and direction shall be executed using factory fabricated watertight transition assemblies conforming to the plans and specifications.

1073.6.2 Seal Properties. The seal shall be able to meet the following properties:

Property	**Requirement**
Temperature Service Range, ASTM C 711	-40° F to 185° F
Bleeding	None at 180° F @ 50% compression for 3 hrs
UV Resistance, ASTM G 155	No Changes at 2000 hrs
Polymer impregnation agent	Free of any waxes or asphalts

1073.6.3 Adhesive Properties. The epoxy adhesive shall be a 100% solids, two component moisture sensitive modified epoxy adhesive which meets ASTM C 881.

1073.6.4 Sealant Properties. The silicone sealant shall be a one part, cold applied chemically curing silicone joint sealant which meets ASTM D 5893.

1073.7 Preformed Silicone or EPDM Joints. All components, materials and equipment required for the installation shall be obtained through an approved supplier of the system. All components of each respective joint system shall come from the same manufacturer and cannot be substitutes for others.

1073.7.1 Joint Properties. The joint material shall meet or exceed the following physical requirements:

Property	**Specification**	**Requirement**
Durometer (Shore A)	ASTM D 2240	55 ±5 min.
Tensile Strength	ASTM D 412	550 psi min.
Elongation	ASTM D 412	350% min.
Tear Strength (Die B)	ASTM D 624	100 ppi min.
Compression Set At 350° F 22 hrs	ASTM D 395	30% max.
Operating Temperature Range		-60° F to 350° F
Specific Gravity		1.51 ±0.10

1073.7.1.1 The joint seal shall be pre-qualified by undergoing and passing a cyclic loading test. Any rips, tears or bond failure will be cause for rejection. Manufacturer shall provide documentation to verify testing meeting these minimum requirements.

Cyclic Loading Test	
Property	**Requirement**
Test Sample Length	2 feet min.
Joint Skew	45°
Number of Cycles	200 min.
Joint Opening	2 inches
Movement	Min. to Max Opening
Temperature	-20° F

1073.7.2 Epoxy Primer. Epoxy primer shall be used to ensure the appropriate bond of the joint sealing system and to protect the surfaces of the joint after installation of the seal. The epoxy primer shall meet the following physical requirements:

Epoxy Primer		
Property	**Specification**	**Requirement**
Viscosity (centipoises)	ASTM D 2196	44
Solids	ASTM D 4209	41
Specific Gravity	ASTM D 1217	0.92
Flashpoint	ASTM D 56	48
VOC	ASTM D 3960	520

1073.7.3 Locking Adhesive. The adhesive material shall cure quickly and shall be as recommended by the manufacturer. The material shall adhere to concrete, elastomeric concrete, polymer concrete and steel and shall meet the following physical requirements:

Locking Adhesive		
Property	**Specification**	**Requirement**
Sag/Flow	ASTM C 639	3/16 inch max.
Hardness	ASTM C 661	20-30
Tack Free Time	ASTM C 679	30 minute max.
Cure Through To ¼ inch thickness	At 75°F/50% Relative Humidity	24 hours max.
Skin over time (Tooling Time)	At 75°F/50% Relative Humidity	5 minute max.
Resistance to U.V.	ASTM C 793	No cracking, Ozone Chalking or Degradation
Tensile Strength	ASTM D 412	200 psi min.
Elongation	ASTM D 412	450% min.

SECTION 1081 – COATING OF STRUCTURAL STEEL

Delete Sec 1081.4.3.3.1 and substitute the following: ***04/17***

1081.4.3.3.1 Hazardous Waste Notification. The contractor shall submit a "Notification of Regulated Waste Activity" form to MDNR Hazardous Waste Program to obtain the EPA identification number. Requests shall be submitted as soon as hazardous waste is determined or at least 30 days prior to shipping hazardous waste. The cost of obtaining the EPA identification number will be considered as part of the surface preparation cost and the engineer will subtract the cost from the contract. Hazardous waste shall not be shipped offsite until the EPA identification number has been received. The contractor will file the quarterly and annual hazardous waste reports in accordance with 10 CSR 25-5.262(2)(D)1 and will deactivate the EPA identification number upon contract completion. The contractor shall submit copies of all hazardous waste manifests and quarterly/annual reports to MoDOT's Environmental Section.