

SPECIFICATIONS REFERENCE

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1.0 CONTRACTOR REQUIREMENTS – GENERAL

1.1 Pursuant to section 34-8-1(a) of the Code of Alabama , each contractor must submit with their bid, proof of licensing through the Alabama State Board of Licensing for General contractors, with approved maximum bid limits sufficient to cover the bid related to this specification. Failure to comply will be cause for rejection of the bid. A copy of the vendor's current year's license will expedite the valuation process.

1.2 Each contractor should submit with their bid, proof of liability insurance in the minimum amount of \$500,000 per occurrence, \$1,000,000 aggregate. Each contractor should further provide proof of workman's compensation insurance sufficient to satisfy all legal requirements of the State of Alabama. Failure to provide this documentation with the bid package will delay the evaluation process.

1.3 The successful bidder will be required to submit a performance bond, in the amount of one and one-half times the bid price of \$300,000.00, whichever is greater, prior to award of the purchase order.

1.4 All documentation MUST be submitted prior to award of the purchase order. All insurance certificates and bond instrument shall indicate State of Alabama, Department of Finance, and Division of Purchasing as certificate/bond holder.

1.5 Due to the nature of this project, award will be made on an "All or None" basis to the recommended vendor, who during the course of our bid evaluation is found to be the lowest possible responsible. Award will be made by added together all unit items costs for a total bid.

1.6 After the award of the contract and before materials are delivered to the job site, the contractor shall submit to the Division Maintenance Engineer a complete list of all materials proposed to be furnished and installed.

1.7 In addition, the contractor shall submit satisfactory written certification of compliance with the ASTM standards contained within this specification.

1.8 Vendors are hereby notified that this contract may be subject to the Alabama Gross Receipts Tax.

2.0 WORK SCOPE

2.1 All work shall be done in compliance with applicable sections of the Alabama Department of Transportation Standard Specifications for Highway Construction, 2008 Edition, Alabama Department of Transportation Standard Drawings, and the latest edition of the MUTCD. The

materials used shall be chosen from the Materials, sources, and Devices with Special Acceptance Requirements Manual. The traffic control scheme shall be submitted to the Division Traffic Engineer for his/her review seven (7) days prior to starting initial work.

2.2 The quantity stated in this solicitation is an estimate only for comparative purposes and in no way obligates the Department to any specific quantity of purchase. Actual maintenance requirements may be less than or greater than the estimated quantity as shown for each item. All quantities and dimensions are estimated and should be field verified by the contractor.

2.3 The contractor will be responsible for all traffic measures. Attention is drawn to the fact that this work will be performed under traffic conditions. The contractor will be responsible for assuring that all traffic control devices meeting the Manual for Uniform Traffic Control Devices and that they are placed on the roadway in compliance with part 6 of the same manual. The contractor will be responsible for insuring that all employees wear appropriate safety apparel in accordance with the latest edition of the MUTCD and in accordance with the standards of the ANSI 107-1999 Class 2.

2.4 All repairs should cause minimal loss in flow capacity and should increase the strength of the structure to maintain proper horizontal and vertical profiles of the roadway above.

2.5 Effective period will be from fifteen (15) calendar days from the date of the Notice to Proceed through completion of the work.

2.6 The contractor will begin work fifteen (15) working days from the date of the Notice to Proceed and will have 90 calendar days to complete the work.

3.0 PERFORMANCE REQUIREMENTS

3.1 Bid price shall include all materials, hardware, supplies, tools, equipment, labor, transportation, and other necessary incidentals required for the completion of the work in an approved and satisfactory manner.

3.2 If required, on-site storage of job materials and/or equipment is to be coordinated with the District Manager prior to the beginning of work. The security of any material and/or equipment left on-site will be the responsibility of the contractor.

3.3 The performance of any work under these specifications will not be deemed complete until the contractor has satisfactorily removed all debris and cleaned up the work site. At no time during the performance of work will materials, debris or trash be allowed to accumulate in such a manner as to endanger the safe performance of the work or the safety of the traveling public.

3.4 This work will be performed upon completion at designated location.

3.5 Unit of work for debris removal will be included in the lining unit price and shall include the removal and disposal of all damaged and removed material. All material which is to be removed shall be disposed of by the contractor and these related costs should be reflected in the

unit price. Work will include removal of various types of debris affecting the designed flow of the drainage structure. The contractor shall be required to handle all disposal of debris removal.

3.6 No work will be performed without prior approval and notification by the Division Maintenance Engineer.

3.7 Note that the roadway pipe will be constructed of concrete.

3.8 Unit work required at each site is to be approved by on-site inspector or Division Maintenance Engineer prior to work at each site.

3.9 The contractor will be required to remove any trees to allow for repairs to the headwall.

3.10 The Contractor shall perform construction so as not to adversely impact the local environment in violation of regulations enforced by the Alabama Department of Environmental Management (ADEM) or the Environmental Protection Agency (EPA). If the Contractor is found to be in violations, the work will be stopped until conditions are restored to a satisfactory state.

3.11 The Contractor shall warrant all work against defects in materials and workmanship for a period of two (2) years to ensure maximum performance of the lining. Warranty inspection will be performed two (2) years from the date of acceptance at the Contractor's expense by video inspection. Any defects will be corrected at the Contractor's expense.

4.0 MINIMUM SPECIFICATIONS

4.1 Installation Crew

4.1.1 Foreman shall have experience including as an operator/applicator of the equipment/product required to meet the proposal. Provide manufacturer certification that the Foreman has been trained and approved in the handling, mixing, and application of the products to be used.

4.1.2 Operators/applicators shall have experience in proposed construction within storm drainage systems and shall have successfully demonstrated all the duties for which he/she shall be responsible on this project. Provide four (4) references which demonstrate previous successful projects completed for the specified structural protective coating system or comparable during the last (2) years.

4.1.3 Operator/applicators responsibilities include but are not limited to the following:

a. Ensure that all surfaces to be lined are clean and free of laitance and loose material, using air and water to blast debris from pipes/culverts/bridges.

b. Regulate material content so as to provide a proper mix that will be plastic enough to give good compaction and low percentage of rebound without sagging.

- c. A procedure should be followed so that corners are filled with material to eliminate voids as much as possible in the lining and to prevent loss of drainage flow.
- d. Determined necessary operating procedures for placement of the lining material in confined areas, over extended distances and/or around unusual obstructions where placement methods may need to be adjusted to provide adequate structural function.
- e. Crews should be directed when to start and stop if material placement is not in conformance to the placement guidelines.
- f. Ensure that any pockets of structurally unsound material are removed and replaced.
- g. The lining should be constructed neatly and in a workmanlike manner.
- h. Crews shall have successfully demonstrated all of the duties for which they shall be responsible on this project as specified by the product's required construction procedures.

4.2 Equipment Certification

4.2.1 Certification that the equipment to be used for applying the products has been manufactured or approved by the protective coating manufacturer and Application personnel have been trained and certified for the proper use of the equipment. Certification letter shall be dated within six months of the bid date.

4.2.2 Equipment shall be used that is capable of installation at a rate that will provide adequate production and with an accuracy that will ensure uniformity. Weighing equipment shall be capable of batching with the accuracy specified in ASTM C-94. Volumetric equipment shall be capable of batching with the accuracy specified ASTM C-685.

4.3 TESTING AGENCY QUALIFICATIONS

4.3.1 Contractor shall secure, at his expense, the services of a testing laboratory meeting the requirements of ASTM E-329. The testing laboratory shall be normally engaged in the testing of concrete materials and concrete. Contractor shall submit the qualifications of the testing agency to owner for approval in accordance with the requirements for submittals contained in the specification. The materials testing laboratory shall make all tests to provide the quality control that shows that the shotcrete and shotcrete materials provided meet or exceed the requirements of this specification. As interpretations of the test results is required, contractor shall further be responsible for securing the services of an independent Professional Engineer licensed in the State of Alabama who shall review and certify the test results. Certified test results shall be submitted by contractor to owner in triplicate.

4.4 STRUCTURAL DESIGN PARAMETERS

4.4.1 Structure condition should be considered a partially deteriorated gravity culvert.

4.4.2 Soil type should be considered saturated for maximum performance of the product.

4.4.3 Design thickness should be based on design requirements found in the design standards listed for each product/process throughout this document.

4.4.4 Ovality of the pipe shall not be greater than 10%.

4.4.5 The soil load used for design shall be 120 pounds per cubic foot.

4.4.6 The Traffic Load will be AASHTO HS-20-44 Highway.

4.4.7 Soil Modulus shall be 1000 psi

4.4.8 The Factor of Safety shall be 2.0.

4.4.9 The soil cover shall be measured at the distance from the grade to the crown of the pipe.

4.4.10 The water table shall be considered saturated condition (same elevation as the soil cover at the top of any pipe).

4.4.11 The design life shall be a minimum of 50 years.

4.4.12 All designs must be submitted with calculations prior to performing the work. Calculations should be clear and should reference applicable American Society for Testing and Materials (ASTM), American Concrete Institute (ACI), National Association of Corrosion Engineers (NACE), and the Society for Protective Coatings (SSPC) standards.

4.4.13 Design calculations shall include Flexural Strength and Flexural Modulus capable of meeting all the load requirements based on the aforementioned design parameters.

4.4.14 Third party testing shall be used to confirm Flexural Strength used on this project.

4.4.15 Third party testing shall be used to confirm long term Flexural Modulus of Elasticity. This third party testing will verify the long term reduction factor (Creep Analysis) of a minimum of 50%. This long term reduction factor verification shall be conducted utilizing ASTM D2990-01 via a third party independently certified laboratory.

4.5 APPROVED LININGS

4.5.1 To be designed and recommended by the bidder and certified to meet all design parameters in Section 4.4

4.5.2 All linings must be preceded by construction that grouts voids in the concrete culvert and rock walls and floor.

4.5.3 After grouting is complete, install # 4 reinforcing steel bars at 8" centers, 24" long and 2 #4 reinforcing steel bars longitudinally at the invert for the entire length of the concrete and rock culverts. Reinforcing steel shall meet the requirements of ASTM A-615, Grade 60.

5.0 PRODUCTS

5.1 Must meet all applicable standards (ASTM, ACI, NACE, etc) as provided in the bid

package.

5.2 Any testing required by the provided standards will be required by a third party as previously stated prior to payment.

6.0 DELIVERY, STORAGE AND HANDLING OF MATERIALS

6.1 Contractor shall be solely responsible for the proper delivery, storage, and handling of materials to prevent contamination, segregation, extreme temperature, exposure or damage as prohibited by the manufacturer, deformation of the product that reduces the strength and durability of the material.

6.2 Damaged or unsuitable products shall be promptly removed from the job site and shall be replaced with suitable materials.

7.0 EXECUTION

7.1 Flow Control

7.1.1 Contractor shall provide for maintenance a flow in the affected portions of the drainage system during the installation of the shotcrete lining.

7.2 Cleaning

7.2.1 Prior to the installation of shotcrete lining, contractor shall thoroughly clean the pipe/culvert designated to receive the liner. Cleaning shall constitute removal of all solids, roots, deposits, and other matter which would preclude the installation of the concrete liner into the pipe line.

7.3 Inspection of Pipelines

7.3.1 Prior to the installation of shotcrete lining, contractor shall inspect the pipe/culvert designated to be lined.

7.4 Surface Preparation

7.4.1 Contractor shall remove all unsound and loose material before applying shotcrete. Contractor shall chip or scarify any area to be repaired to remove offsets which would cause an abrupt change in thickness without suitable reinforcement. All edges shall be tapered so as to leave no square shoulders at the perimeter of the cavity. After all chipping work has been completed; the entire surface shall be thoroughly sandblasted and cleaned with a compressed air blast and jet water blast using a cement gun to remove all dirt, debris and loose particles to permit a satisfactory bond between the existing surface and the shotcrete. Air pressure in the cement gun shall be less than 50psi.

7.4.2 Contractor shall sandblast existing surfaces that do not require chipping to remove paint, oil, grease, silt, slime, and other contaminants, and provide a roughened surface for proper bonding of the shotcrete. Blasting of steel surfaces shall be in compliance with SSPC-SP6.

7.4.3 The chipped and blasted surfaces shall be dampened but without visible running water. Shotcrete shall not be placed on any area where free running water exists.

7.4.4 Loose bricks, in areas are not specifically mentioned, shall be removed and the void filled with shotcrete. This shall apply only to isolated situations where only a few (one to ten) are loose.

7.4.5 Void areas that extend beyond the outside plane of the pipe line or manhole/junction box into the surrounding soil shall be filled and stabilized using pressure injected grout to the outside plane of the pipe line.

7.4.6 Contractor shall fill all voids and repair deficiencies in the culvert and manhole/junction box with shotcrete.

7.4.7 Contractor shall repair any damage to the existing structure resulting from his cleaning or void filling operations at no cost to the owner.

7.4.8 Contractor shall remove and properly dispose of, as approved by the Engineer, all debris and rebound from the pipe/culvert that results from his cleaning and shotcrete placement operations. No debris shall be permitted to wash down into the drainage system.

7.4.9 The contractor shall contact utilities to identify all pipe and conduit in the pipe/culvert to be rehabilitated.

7.5 Placement of Lining

7.5.1 Linings shall be placed in such a manner as to meet or improve current flow.

7.5.2 Linings shall be placed as directed by the provided design standards (ASTM, ACI, SSPC, NACE, etc) and meet the minimum parameters as verified by the engineer of record. 6.5.3

7.8 Surface Finish

7.8.1 Contractor shall bring the lining material to an even plane and well formed corners where applicable.

7.8.2 After the body coat has been placed, the surface shall be trued to remove high areas and expose low areas. Low areas must be filled to ensure a true, flat surface.

7.8.3 After the surface has been trued, the entire surface shall receive a treatment providing a smooth finish surface with any brush finish (if concrete) to be finished parallel to the flow.

7.9 Lateral Reinforcement or Abandonment

7.9.1 Contractor is responsible for identifying all active and abandoned laterals and their locations. The contractor shall submit a lateral abandonment plan prior to the beginning of work. The plan shall include the locations and sizes of all laterals and whether they are active or abandoned.

7.9.2 It shall be the contractor's responsibility to determine and to assure that all live laterals are connected. Laterals reinstatement shall be completed from inside the pipe. Excavation for lateral reinstatement shall be permitted.

7.10 Index of Specifications

7.10.1 Null-Provided with bid package

8.0 PAYMENT

8.1 All incidental cost should be included in the unit prices. The attachment to these specifications will be used as a guide in price calculation.

8.1.1 Unit price is per "EACH" structure.

8.1.2 Bid will be awarded based on the lowest bid that meets all design parameters in Section 4.4.

8.2 Any bypass pumping, cleaning, pre and post construction televising, labor, equipment, materials, traffic control, installation, service reconnection/abandonment, safety, dust/erosion control, testing, site restoration and all other work specified or not, which is reasonably required to provide a completed installation shall be included in the bid prices as incidental.

8.3 Before payment is made, all test results must be submitted and confirmed that the lining meets all the aforementioned specifications.

8.4 Invoice must indicate the unit of work performed per location and shall be an invoice including the name and address on the purchase order/contract. Invoice to be submitted and processed after final acceptance of work performed.

8.5 Payment will be made after all structures are complete.