**EXHIBIT I**

**SCOPE OF SERVICES**

**Preliminary Road Design, Preliminary Bridge Design, Section 404 Corps of Engineers Permit, Right of Way Plan Design, Utility Coordination, Final Roadway Design, Final Bridge Design and Plans Production for J70532 replacing Bridge P0973 with A9230.**

This scope of services is intended to be an accurate description of the items and tasks required for completion of the design of this project. However, each project is unique and may require effort in an individual task to complete the design. The following information will explain and define in general terms the major design items of importance relating to this project. All the elements of work that are necessary to satisfactorily complete the design of this project may or may not be listed. The lack of a specific listing of an element or item in the scope of services does not in itself constitute the basis for additional services, supplemental agreements, and/or adjustment in compensation.

A more detailed description of the process and requirements used by MoDOT for completion of the design may be found in the EPG. The consultant is encouraged to review the appropriate sections of the manual to supplement the information contained in the scope of services and provide additional guidance in the requirements and expectations of MoDOT for completion of the design services.

Services rendered by the CONSULTANT, which are considered additional services, will be addressed under a supplemental agreement. The provisions of the Design Consultant Agreement outlining the responsibilities of the CONSULTANT regarding the quality and accuracy of the deliverables and products shall apply to any decisions regarding determinations of additional services.

Preparation of a supplemental agreement is necessary prior to performance of any work, which is considered as additional services, not included in the original scope of services. The consultant will not be compensated for additional services performed prior to execution of a supplemental agreement. Only additional services, which are required due to changed or unforeseen conditions or are due to a change in the specified deliverable, will be considered for inclusion in a supplemental agreement.

The CONSULTANT will provide the professional, technical, and other personnel resources, equipment, materials and all other things necessary to prepare the preliminary plans, right of way plans, and construction plans and data required for development of this specific project. The survey data shall be based on the Missouri State plane coordinate system and modified by a factor approved by the COMMISSION. All elevations and vertical control shall be based on NAVD 88.

The CONSULTANT shall prepare all plans through use of a Computer Aided Drafting (CAD) program. The CONSULTANT shall conform to the Missouri Department of Transportation Specifications for Computer Deliverable Contract Plans as referenced in the EPG. Unless otherwise specified all plan sheets and CAD plots shall be electronically delivered to the COMMISSION as 22-inch by 34-inch sheets and shall conform to the Specifications for Computer Deliverable Contract Plans.

The CONSULTANT will be required to produce and update the construction cost estimate for this project at the completion of each major milestone or at a minimum of every six months. The major milestones for this project are defined as the preliminary design, right of way design (if necessary), and final design. The CONSULTANT shall review "as built" plans, aerial photographs, manuscripts, etc. and other information to be provided by the Commission and make the necessary field investigations to assure that there have been no significant changes since the information was recorded or obtained.

The CONSULTANT shall provide the professional, technical and other personnel resources, equipment, materials and all other things necessary to prepare the preliminary plans, Right of Way plans, and construction plans for the bridge improvements.

The CONSULTANT shall perform the following services, all in accordance with the standard practice of the Commission and AASHTO LRFD Design methods:

**I Preliminary Roadway Design**

The CONSULTANT’S attention is directed to Chapter 235 of the MoDOT Engineering Policy Guide (EPG) for general guidelines and requirements for preliminary design. Other chapters may be applicable for preliminary design preparation.

1. Upon approval of the design criteria memorandum by COMMISSION, the CONSULTANT shall undertake the following to develop the preliminary design phase:
   1. Prepare preliminary plans, as outlined in the MoDOT EPG.
      1. The COMMISSION shall furnish the CONSULTANT traffic information for the construction and design years to be used in the preliminary plans.
      2. The CONSULTANT shall submit the preliminary plans to the COMMISSION for review and approval as shown in Exhibit IV.
   2. The preliminary plans shall be prepared in accordance with the applicable sections of the MoDOT EPG, as to what shall be shown thereon, including proposed design features.
      1. Preliminary Plan Title Sheet
      2. The plan view English scale shall be 1”=20’ horizontal (or different scale as determined by MoDOT Project Manager for clarity) and extend 100 feet beyond project limits.
      3. The profile view English scale shall be 1”=20’ horizontal, and 1”=10’ vertical.
      4. Special Sheets for geometrics and special design features.
      5. Preliminary drainage sheets (or information provided in plan sheets)
      6. Tentative Easement and Right of Way limits with property lines and ownership information, if needed.
      7. Traffic Control and Staging Concept ideas described in the Preliminary Plans letter of transmittal.
   3. The CONSULTANT may have to review preliminary cross sections sufficiently to make a cost comparison between using retaining walls versus acquiring additional right of way for all proposed wall locations.
   4. The CONSULTANT shall prepare the construction estimate. The COMMISSION shall prepare the right of way estimate based on the right of way requirements furnished by the CONSULTANT. The CONSULTANT shall include utility impacts in the plans and construction cost estimate for those utility impacts that are determined to be included in the construction contract.
   5. The preliminary plans shall be submitted to the COMMISSION for review and approval. A letter of transmittal shall be provided with the preliminary plan submittal along with the preliminary plan checklist. The COMMISSION shall furnish the template for the letter of transmittal and checklist. The construction cost estimate shall also be submitted with the preliminary plans.
   6. The preliminary plans shall include the tentative additional easement and right of way limits, property lines and ownerships, section lines, township and ranges, any U.S. Surveys, city limits, and a general outline of the construction staging, critical design items and other items as outlined in the EPG.
   7. Traffic assignments shall be shown on the respective roadways or on a line sketch of the roadways.
   8. Typical sections shall indicate heavy, medium or light duty pavement for new roadways, along with descriptions of the existing roadway types remaining in place.
2. A Preliminary Field Check will be arranged with the COMMISSION to discuss design features in the project area.
3. The CONSULTANT shall provide the COMMISSION with information for proper environmental and cultural clearance including submittal of the preliminary stage RES, right of way stage RES (if needed) and final stage RES. Items that may need to be addressed include historical buildings, archaeological sites, historic bridges, conversion of farmland, endangered species, wetlands, parklands and historical sites.
4. The COMMISSION will provide CONSULTANT with the Bridge Survey Report and the survey portion of the Bridge Survey Checklist. The CONSULTANT shall prepare and submit the Bridge Survey Report, Bridge Survey Sheets, and completed Bridge Survey Checklist based on the information provided by the COMMISSION.
5. The COMMISSION will provide CONSULTANT with all topographic and property land survey control information. All elevations and vertical control shall be based on NAVD 88.
6. The COMMISSION shall provide the pavement design and general Job Special Provisions related to the project but not special design elements.
7. The COMMISSION may hold a public meeting for this project, but the CONSULTANT will not be required to attend. The CONSULTANT shall provide exhibits for MoDOT public meeting as requested.
8. The COMMISSION will provide coordination of right of way acquisition including legal plats, descriptions, appraisal, and negotiations based on the right of way plans furnished by the CONSULTANT.

**II Preliminary Bridge Design**

1. Perform the geometric analysis at the proposed bridge site necessary to develop type, size and location drawings consisting of a general plan and elevation plan of the structures, typical roadway sections and roadway profiles. This includes preparation of the Bridge Memorandum & Layout (including the itemized preliminary bridge estimate).
2. The structure and/or box culvert type and size (if applicable) shall be based on roadway alignments, geometric analysis, hydraulic analysis, spill slope requirements, roadway grades and/or clear zone requirements.
3. The superstructure type shall be dependent upon site constraints and a detailed cost analysis comparison.
4. All requirements of the Federal Emergency Management Agency’s National Flood Insurance Program shall be met.
5. Discharges will be estimated using USGS Regression Equations and available stream gauge data.
6. HEC-RAS shall be used to model of the natural, existing and proposed conditions.
7. Scour calculations shall be performed in accordance with FHWA Hydraulic Engineering Circular No. 18.
8. The results of the hydrologic, hydraulic and scour analysis shall be documented in the Bridge Hydraulic and Scour Report.
9. All requirements outlined in the MoDOT Engineering Policy Guide (EPG) shall be met. The CONSULTANT shall follow MoDOT’s “practical design” philosophy and submit any design exceptions as necessary.
10. Develop final detailed design criteria in the form of Bridge Memorandum and Bridge Design Layout documents.

**III Section 404 Corps of Engineers Permit**

The CONSULTANT shall provide the following information necessary to allow MoDOT staff to apply for any required Section 404 Corps of Engineer Permits. If the permit is required due to bridge construction, the application data shall be submitted no later than with the T.S.&L. drawings. All information should be provided to the MoDOT Project Manager who will forward the information to Central Office Design.

1. Provide the amount and type of excavation and material that will be used in streams, lakes, and wetlands below the Corps of Engineers’ ordinary high water line (OHL) elevations.
2. Provide location and quantities of permanent berms and spill fills below OHL.
   1. Earth fill, rock blanket (square feet and cubic yards)
   2. Rock blanket along right descending bank and left descending bank (linear feet)
   3. Rock ditch (square feet)
3. Provide location, excavation and size of pier below OHL.
   1. Excavation (cubic yards)
   2. Pier (square feet)
4. Provide channel realignment data.
   1. Existing channel length of section to be modified (feet)
   2. Average channel width of section to be modified (feet)
   3. Realigned section, length and width (feet)
5. Provide temporary fill amounts in wetlands or below OHL in streams.
   1. Earth fill (square feet and cubic yards)
   2. Class C (square feet and cubic yards)
6. Provide information about temporary fills and shoring.
   1. Location of temporary fills and shoring
   2. Source of material
   3. Final disposition of removed materials
7. Provide information about temporary culverts.
   1. Number of culverts
   2. Size (inches)
   3. Length (feet)
8. Provide information on channel cleanout – excavation below OHL.
   1. Cleanout upstream and downstream of structure (linear feet)
   2. Total quantity of material to be removed below OHL (square feet and cubic yards)
9. Provide 8 ½-inch by 11-inch copies of any plan or profile sheets required for the permit application.
10. Provide bridge elevation and plan views with OHL indicated.

**IV Utility Coordination**

The CONSULTANT shall lead the effort on utility coordination and shall work with the professional land surveyors for the following project documentation and plan details:

1. Review completed topographic surveys to develop preliminary plans, right-of-way plans and final roadway plans, including any necessary improvements and existing topography within the limits of the project. Topographic surveys shall consist of pertinent topographic features.
2. Field check topographic survey for visible above ground evidence of utilities located within the project area. “Missouri One Call” and MoDOT will be contacted prior to the field check and a formal request will be submitted by the COMMISSION for marking the locations of member utilities. If “Missouri One Call” fails to respond, in whole or in part, to the formal request, underground facilities, structures, and utilities will be plotted from surveys and/or available records. The locations of all utilities are to be considered approximate. There may be other utilities, whose existence may not be known at the time of the survey.
3. Consult with MoDOT’s Utility Engineer to coordinate with surveyors on underground utility locates.
4. Coordinate with MoDOT’s surveyors and MoDOT’s Utility Engineer to obtain initial One-Call tickets to have utilities located in identified areas of proposed project. Coordinate additional MO One Call tickets after preliminary design is complete for any additional items to be added to the final design plans compared to the preliminary design plans.
5. Coordinate with surveyor to complete utilities survey and review completeness of utility topographical survey. Service connections shall be included as part of the utility survey.
6. Coordinate with utility companies on the development of the plan of adjustment and obtain cost estimates for reimbursable utilities for the District Utility Engineer’s approval.
7. Show the existing utility facilities and plan of adjustments for proposed utilities facilities in the contract plans. (plans sheets, cross sections, profile sections).
8. Work with the various utility owners to determine if any needs for renewals within the project limits.
9. Coordinate relocation of each impacted utility on the project during design and construction.
10. Prepare special utility sheets (including utility profile and exhibits).
11. Assist District Utility Engineer and/or Coordinator in the preparation of agreements.
12. Identify locations for power service needs, prepare service request for submittal and coordinate with the power company to obtain estimated costs.
13. Coordinate with MoDOT District Utility Engineer regarding the need for test holes and initiating the potholing with the applicable utility owner. Provide test hole information at critical utility locations to the District Utility Engineer.
14. Prepare utility job special provision and information for the preparation of the Utility Status Letter for District Utility Engineer.
15. Provide assistance and answer utility related questions during the construction phase for MoDOT staff and the roadway contractor.

**V Right of Way Design**

1. The CONSULTANT shall prepare right of way plans, which may be separate drawings from those used for design and construction details. The right of way plans shall show alignment, geometric design, removal of improvements, drainage facilities, property lines and ownership, other land survey information, street lines and existing right of way and easements. The CONSULTANT should also include any plan details, which will require additional right of way or easements during the construction phase of the project such as bypasses, temporary erosion control, etc. Right of way plans include title sheet, typical sections, profile sheets, and cross sections of the roadway, entrances and side roads. Areas of new right of way, permanent easements and/or temporary easements required from each individual property owner may be shown in tabular form on the respective sheets.
   1. The CONSULTANT shall finalize any previous review of the roadway cross sections sufficiently to determine the feasibility of constructing retaining walls versus obtaining additional right of way. This final review shall consist of construction estimates versus right of way estimates.
   2. Upon completion of the estimates by COMMISSION and CONSULTANT, the CONSULTANT shall recommend to the COMMISSION a choice at the various locations which warrant consideration of the alternate retaining wall versus right of way solutions. The COMMISSION shall make the final determination of purchasing right of way or constructing retaining walls.
2. Right of way plans shall be submitted to the COMMISSION for review and approval. The right of way plans shall be at the same scale as the construction plans. The right of way plans shall include any design details that will control the width of right of way and necessary easements.
   1. New right of way lines and all easements shall be dimensioned from the centerline, or cross road centerlines, if necessary. Bearings and distances on the right of way lines may be required.
   2. The following minimum design features shall be included on the right of way plans:
      1. Title sheet with appropriate project limits, access note and traffic data completed.
      2. Typical Sections
      3. Cross sections at 100’ intervals, including additional sections at each entrance with new and existing entrance grades.
      4. Construction limits (slope lines); drainage facilities; entrances and their reference location, width and type; property owners, with areas of new right of way, easements and remaining property; centerline bearing, ties to legal land corners from centerline stations with notation for corner witness by a registered land surveyor; existing utility locations and easements, including replacement utility easements; horizontal curvature information; and proper right of way symbolization for new right of way (access control) and easements, including areas which may be required to accommodate temporary erosion control.
      5. Township, Range, Section and/or U.S. Survey information on each plan sheet near the title block or appropriate survey/section line. The section line information will be provided to the ¼ ¼ section lines.
      6. Driveway Profiles – CONSULTANT shall develop and layout horizontal and vertical alignments for all driveways within the project limits.
      7. Special Sheets
      8. Culvert Sections/Storm Drainage – CONSULTANT shall finalize size and length of any culverts and place description on plan sheets.
      9. Cross sections – CONSULTANT shall develop cross sections for the purpose of determining right of way impacts/takes and quantities.
3. The CONSULTANT shall provide an updated construction cost estimate as well as expected construction schedule for durations of work activities for the Right of Way design stage.
4. The COMMISSION shall arrange for a design field check to review right of way plans with the CONSULTANT and right of way personnel prior to completion of the right of way plans. The CONSULTANT shall make any necessary revisions to the right of way plans as determined by this design field check.
5. The CONSULTANT shall submit the Right of Way plans and construction cost estimate with a letter of transmittal. The letter of transmittal shall be provided as a word document. The COMMISSION will furnish the template for the letter of transmittal.
6. The CONSULTANT shall submit the Right of Way Plan checklist. The COMMISSION shall provide the checklist to the Consultant upon request.
7. The CONSULTANT shall be responsible for making all revisions to the right of way and construction plans due to negotiations with the property owners to acquire right of way.
8. The CONSULTANT shall provide approved Right of Way plans and exhibits for each parcel acquisition affected by the project, including temporary and permanent easements required.
9. The CONSULTANT shall provide one (1) electronic set of fully signed and sealed right of way plans, updated cost estimate, right of way plan checklist and letter of transmittal to the COMMISSION at least thirty (30) days prior to MoDOT’s scheduled due date of administrative submittal.
10. The CONSULTANT shall provide one (1) electronic set of approved Right of Way plans and cross sections to be used by MoDOT’s Utilities Department. The known utilities shall be color-coded on the plans.
11. The COMMISSION shall review, approve and certify the right of way plans as completed by the CONSULTANT. The CONSULTANT shall provide one (1) electronic set of fully signed and sealed right of way plans, for the COMMISSION’S use.
12. The COMMISSION will provide title insurance information, prepare right of way appraisals and secure the necessary right of way by negotiation or condemnation, if necessary, for construction of this project.
13. The CONSULTANT will provide the COMMISSION with information for proper environmental and cultural clearance including submittal of the Right of Way stage RES. Items that may need to be addressed include historical buildings, archaeological sites, historic bridges, conversion of farmland, endangered species, wetlands, parklands and historical sites.

**VI Final Roadway Design**

1. The CONSULTANT shall coordinate utility company activities for any adjustments required to be included in the final design plans.
2. The CONSULTANT shall utilize MoDOT’s Southwest District Temporary Traffic Control streamline plans.
3. The CONSULTANT shall prepare detailed temporary erosion control plans for review and approval before inclusion in the final design plans.
4. The CONSULTANT shall prepare computations for all design plan quantities. All plan quantities shall be shown on the Quantity Sheets, by construction stage, if applicable. The format for these sheets shall be furnished by the COMMISSION. Specialty items may have separate sheets for quantity tabulations.
5. The CONSULTANT shall prepare for review and approval any design exceptions required for construction of the project.
6. The CONSULTANT shall provide an updated construction cost estimate as well as expected construction schedule for durations of work activities for the final PS&E design stage.
7. The CONSULTANT shall prepare for review and approval by the COMMISSION all General Job Special Provisions, which are to supersede the Missouri Standard Specification for Highway Construction. A brief reason for the deviation from the standard plans and specifications should also be provided. The CONSULTANT shall prepare only Job Special Provisions related to design elements shown in the plans.
8. The following list shall be considered the minimum requirements for a complete set of Final Design Plans.
   1. Title Sheet
   2. Typical Sections
   3. Quantity Sheets
   4. Plan Sheets at 1”=20’ horizontal (or different scale as determined by MoDOT Project Manager for clarity). Plan sheets shall include all necessary adjustments to signing and proposed pavement marking.
   5. Profile Sheets at 1”=20’ horizontal and 1”=10’ vertical
   6. Reference Points
   7. Coordinate Points
   8. Culvert Sections at 1”=10’, if needed
   9. Special Sheets for geometrics, referenced points, grading plan, traffic control plan, temporary erosion control plan, pavement marking plan, and any other sheets for special design features.
   10. Earthwork Quantities, Cross Sections at 100’ intervals, 1”=10’ (1:100), horizontal and vertical, including entrance sections with existing and proposed grades
   11. Tabulation of Quantity Sheets
   12. Job Special Provisions in electronic format readable in COMMISSION’S current word processor
   13. File with the bid items and quantities as generated by COMMISSION’S Estimate Program
   14. Construction Workday Study
   15. Final Plans Checklist Form D-12
   16. Electronic Deliverables as per the EPG
9. The CONSULTANT shall provide to the COMMISSION one (1) electronic set of fully signed and sealed Final Design Plans, updated cost estimate in the file formats required, Workday Study construction schedule, Job Special Provisions in Word format, Form D-12, Workzone Impact Analysis Excel spreadsheet, and electronic deliverables through ProjectWise as required by the ENGINEER at least thirty (30) days prior to MoDOT’s scheduled due date of administrative submittal.
10. Additional plans and information may be required to complete the Final Design Plans. With the submittal of the Final Design the CONSULTANT shall also provide the COMMISSION a statement that an internal quality control check has been conducted and to the best of the CONSULTANT’S knowledge the final design plans are free of gross errors, misleading or confusing typos, and includes adequate information to construct the project.
11. The CONSULTANT shall prepare all plans through the use of a Computer Aided Drafting (CAD) program. The CONSULTANT shall conform to MoDOT’s Specifications for Computer Deliverable Contract Plans as referenced in the MoDOT EPG. The CONSULTANT shall use Microstation and Geopak SS4.
12. The CONSULTANT shall furnish the COMMISSION the following completed sheets and documents, as applicable, for each separate construction project included in this contract, as follows:
    1. Preliminary Plans showing profile grades, geometric data, alignment data, etc.
    2. One (1) electronic copy of the location sketch for Commission Approval submitted in electronic format.
    3. Draft copy of the job special provisions related to design elements for review. After corrections, the job special provisions shall be furnished in electronic format utilizing the COMMISSION’S latest word processing program.
    4. One (1) legible electronic copy of engineering calculations and analysis.
    5. One (1) electronic copy of a complete summary of quantities and estimate of construction costs. The estimate shall be prepared using the latest version of MoDOT’s ESTIMATE program.
    6. One (1) electronic copy of the completed Standard Plans list, MoDOT Form D-2.
    7. One (1) electronic copy of a workday study showing the estimated number of workdays required to construct each project.
    8. The CONSULTANT shall provide a 3D model of the project exported from Geopak SS4 software for the COMMISSION’S use.

**VII Final Bridge Design**

Furnish to the COMMISSION fully checked design plans, job special provisions, design computations, quantity computations, final cost estimate, and a construction work day study for the structure(s). The CONSULTANT is expected to make the COMMISSION aware of more economical design alternatives that may become apparent during the preparation of the final design.

1. The plans shall be complete and shall cover all parts of the structure they represent. The degree of detail shall be comparable to that furnished on typical plans prepared by the COMMISSION. High resolution final signed and sealed plans, will be submitted in Adobe Acrobat Reader format version 7 or higher. Final signed and sealed plans shall be in pdf full size (34” x 22”) format. These deliverables shall use the file naming convention and be in accordance with the “Specifications of Computer Deliverable Contract Plans” requirement outlined in the Commission’s Engineering Policy Guide, Section 237.13.3. The electronic plans in Microstation format cannot be signed and sealed. The electronic submittals shall be made in a method suitable to MoDOT.
2. All construction changes made to the plans during construction of the project shall also be submitted electronically in Adobe Acrobat and Microstation format.
3. The job special provisions shall be complete and describe all design features, construction procedures, or material requirements in the plans that are deviations from the latest edition of the Missouri Standard Plans for Highway Construction. Typical job special provisions that have been developed by MoDOT for previous jobs are posted on MoDOT’s website and are available for use and modification as needed. The job special provisions shall include a table of contents sheet that is signed and sealed by a professional engineer registered in Missouri. The signed and sealed job special provisions shall also be submitted in Adobe Acrobat Reader format, version 7 or higher. Job Special Provisions shall also be submitted in Microstation Word format. The submittal letter shall explain the need for each provision.
4. The design computations and plans shall be acceptable to and will become the property of the Commission. The CONSULTANT shall submit design computations in Adobe Acrobat Reader version 7.0 format or greater. The files shall be transferred in a manner acceptable to MoDOT. The design computations shall contain an index file, with electronic links to the files contained within. Submittals shall include a minimum of set of design computations for each project. The design computations shall not be combined with the Microstation or the Adobe Acrobat Reader submittals.
5. The final estimate submitted by the CONSULTANT shall include backup material that supports the estimates made for non-standard or lump sum pay items.
6. The CONSULTANT shall submit the hours and cost summarizing the design effort for each bridge. The summary shall include separate amounts for: Number of Hours for Bridge Preliminary Design, Cost of Bridge Preliminary Design, Number of Hours for Bridge Final Design, Cost of Bridge Final Design. Generally, the above amounts should include all hours and costs invoiced that are attributable to bridge design and plans preparation up to the point of turning in the signed and sealed plans. It should not include hours attributable to preparing the bridge survey, final construction cost estimate, or workday study.

**VIII Construction Support**

1. The CONSULTANT shall be available to the COMMISSION to discuss and interpret plans and specifications during the bidding and construction phase of the project as determined necessary by the Engineer.
2. The CONSULTANT may be required to attend a pre-construction meeting, and a post construction meeting.
3. If issues arise during construction, there will be a direct line of communication established between the MoDOT Construction Office and the CONSULTANT. The CONSULTANT will immediately inform the MoDOT Bridge Division of any recommendations or clarifications made to the Construction Office.