

**NON-PROJECT / NON-TASK SPECIFIC GENERAL ENGINEERING SCOPE OF WORK –  
Colorado Department of Transportation Headquarters and Regions 1 through 5**

**CONTRACT ADMINISTRATION:**

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80222

REGION TRANSPORTATION DIRECTOR: KAREN ROWE COLORADO DEPARTMENT OF  
TRANSPORTATION REGION 2 905 ERIE AVENUE, PUEBLO,  
COLORADO 81001

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TRANSPORTATION REGION 3 222 SOUTH SIXTH STREET,  
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DURANGO, CO 81301

DIRECTOR OF PROJECT SUPPORT JERAD ESQUIBEL COLORADO DEPARTMENT OF  
TRANSPORTATION HEADQUARTERS 4201 EAST ARKANSAS,  
DENVER, CO 80222

General administration of this contract will be delegated to the respective Region Program Engineer involved with this consultant selection process. Active day to day administration and monitoring of contract task orders will be delegated to the Region(s) Resident Engineers responsible for the work described within each task order. Some of these services must be provided under the direct supervision of a Colorado-licensed Professional Engineer (PE) or Professional Land Surveyor (PLS).

Type of work may include all or parts of the following activities:

- A. Tunnel Engineering Services -The scope for tunnel engineering services may include but shall not necessarily be limited to: Provide conceptual drawings, graphs, data collection, or charts for the Region's planning, environmental, maintenance, operations or other units as needed.
  - a. Conduct or update studies for transportation, environmental, NEPA etc.
  - b. Provide support for region planning activities, including assistance with public meetings and/or public information including handouts, website support or development, and public meeting presentations.
  - c. Provide design support for off systems or other modes of transportation alternatives.
  - d. Provide drafting support or CADD services. All CADD work for CDOT will be conducted using Bentley products including Microstation, Inroads Software, and ProjectWise latest versions used by CDOT.

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- e. Provide support research or search county, state or other areas for records or documents relevant to the project or task.
  - f. Provide scoping services.
  - g. Provide scheduling in MS Project or other scheduling software as requested.
  - h. Provide funding guidance and or support including grant applications.
  - i. Prepare, provide support, and coordinate Innovative Contracting documents or supporting information.
  - j. Provide Program Management support and/or financial planning as requested.
  - k. Provide support, preparation, or guidance for Grant Applications including economic analysis.
  - l. Provide Local Agency/Enhancement project support, oversight, and/or guidance.
  - m. Write, review, and/or provide guidance or expertise related to manual preparation or guidance documents.
  - n. Provide/prepare training, advice, or guidance as requested.
  - o. Provide or acquire design services as required to complete tasks not specifically defined in the outline, but that may be required by specific task order.
  - p. Provide Independent Cost Estimates
    - a. Concept and planning estimates
    - b. Project level estimates
  - q. Provide Constructability Reviews
  - r. Provide public relations and public information services.
- B. -The scope of work for structural design activities may include:
- a. Provide design services for various transportation structures or portions of transportation structures, within and adjacent to tunnel facilities.
  - b. Furnish detailing services including drafting and quantity calculations for various transportation structures or portions of transportation structures.
  - c. Inspect and rate elements of the tunnel structure in accordance with the current National Tunnel Inspection Standards.
  - d. Provide structural design and detailed review of work performed by other designers.
  - e. Provide wall design and detailed review of work performed by other designers.
  - f. Provide structural selection reports and structure selection studies.
  - g. Provide a structure concept study.
  - h. Obtain structural data
  - i. Provide foundation investigation reports
  - j. Coordinate with outside agencies; for example, railroad agencies or utility agencies.
  - k. Provide foundation, tunnel lining, ceiling panel, steel hangar and anchorages, tile lined concrete panel and portal investigation reports.
  - l. Provide Construction Administration/Management services for Tunnel projects designed by others
- C. Mechanical Systems
- a. Provide design services for various transportation mechanical systems or portions of transportation system, within and adjacent to tunnel facilities.
  - b. Furnish detailing services including drafting and quantity calculations for various transportation ventilation systems or portions of transportation structures.

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- c. Provide fan motor, emergency generator, drainage and pumping system and water treatment system concept and design and detailed reports.
- D. Fire/Life Safety/Security Systems
- a. Provide design services for various transportation fire life safety, and security systems or portions of transportation system, within and adjacent to tunnel facilities.
  - b. Provide design services for various transportation fire/Life Safety and security systems or portions of transportation system, within and adjacent to tunnel facilities.
  - c. Provide fire detection, waterline for fire protection, emergency generator and tunnel operation and security concept, design and detailed reports.
- E. Electrical Systems
- a. Provide design services for various transportation electrical systems or portions of transportation system, within and adjacent to tunnel facilities.
  - b. Provide design services for various transportation electrical systems or portions of transportation system, within and adjacent to tunnel facilities.
  - c. Provide design services for electrical distribution systems, incoming power, transformer, medium and high voltage switch gear, and motor control, lighting, electronic lane usage and variable message signing concept, design and detailed reports.
  - d. Provide energy usage reports
- F. Roadway Design Activities -The scope of work for roadway design activities may include:
- a. Provide design services including quantity calculations for the various components of roadway construction, which could include intersection layout, signals, structures, lighting, landscaping, irrigation design, ditch design, waterline, erosion control, and sanitary sewer design and groundwater collection.
  - b. Conduct plan, specification, and cost estimate checking and/or quality control.
  - c. Furnish detailing and drafting services utilizing MicroStation and Inroads Software, latest CDOT adopted versions utilizing CDOT format. Other software required for design services and communication of information are Microsoft Office products such as Word, Excel, Power Point. In addition Project Wise, Sharepoint, or FTP sites may be required for file sharing. Other formats or software products may be required for specific tasks such as traffic modeling or truck turning movements.
  - d. Attend and/or conduct meetings as needed such as scoping reviews, design office reviews, field inspection reviews, and final office reviews and provide minutes as appropriate.
  - e. Prepare (PS&E Package) final plans, specifications and provide the CDOT project manager with detailed estimates that can be entered into CDOT Transport application system at any point in the project.
  - f. Prepare revisions under-advertisement to plans or specifications when necessary.
  - g. Design and layout of intersections and traffic operational improvements within and adjacent to tunnel facilities.
  - h. Provide design services for civil element of traffic barrier,
- G. Hydrology Activities -The scope of work for the hydrology activities may include:
- a. Collect historical drainage data-both for surface and subsurface flows.
  - b. Establish drainage basin data.

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- c. Select run-off parameters and predict peak flow.
- H. Hydraulics Design Activities -The scope of work for hydraulics design activities may include:
- a. Furnish the size and location of drainage structures.
  - b. Furnish storm sewer design.
  - c. Furnish erosion protection design and NPDES requirements.
  - d. Furnish design and quantity calculations for drainage structures including irrigation and permanent BMP's for surface drainage.
  - e. Design of water and waste water systems.
  - f. Water quality monitoring and mitigation.
- I. ITS & Traffic Engineering Activities -The scope of work for traffic engineering activities may include:
- a. Collect traffic data.
  - b. Perform traffic studies or analyses including traffic modeling.
  - c. Perform in-field inventories of traffic control device locations and conditions.
  - d. Furnish design and quantity calculations necessary to prepare signal, signing or pavement marking plans.
  - e. Furnish detailing and drafting services.
  - f. Attend meetings such as field inspection and final office review or others as requested.
  - g. Prepare construction signing plans and schedules.
  - h. Prepare final plans and specifications.
- J. Value Engineering (VE) -The scope of work for value engineering activities may include:
- a. Conduct VE meetings and provide minutes. The VE meetings should be considered for the following efforts:
    - i. Brain Storming
    - ii. Evaluating alternatives upon meeting the project purposes and need
    - iii. Recommend alternatives based upon: -Most benefit to purpose and need - Minimal or mitigatable impacts -Constructibility -Cost -Best overall response to constraints and concerns
  - b. Collect and compile VE cost and workhour data.
  - c. Provide Final VE Report.
- K. Materials and Geotechnical Services for Design -The scope of work for design services include:
- a. Provide field sampling and testing of existing pavements, and soils necessary for proper pavement design as per the CDOT Pavement Design Manual.
  - b. Perform boring and subsurface geotechnical investigations for tunnel linings and structures within and adjacent to tunnel facilities.
  - c. Provide testing results used in the design process that are certified by a professional

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- engineer.
- d. Provide other materials and geotechnical services, including but not limited to rock bolt, grouting or other structural mitigations within and adjacent to tunnel structures, life cycle cost analysis, subsurface investigations, instrumentation, foundation reports, landslide evaluations, MSE wall designs, soil nail designs, pavement design, pavement justification reports and retaining wall designs
- L. Environmental Services -The scope of work for environmental services may include:
  - a. Review environmental conditions, determine required permits.
  - b. Delineation and mitigation recommendations of wetlands.
  - c. Prepare and/or review environmental documents for CDOT projects.
  - d. Conduct and prepare environmental surveys and clearance reports.
  - e. Preparation and processing of Nationwide and Individual Section 404 permits.
- M. Utility Services -The scope of work for Utility Services may include:
  - a. Survey/Research existing utilities.
  - b. Map existing and relocated utilities
  - c. Assist or facilitate utility agreements
  - d. Coordinate and discuss utility impacts with utility companies
  - e. Prepare exhibits or other support as needed for utilities
- N. Design Services during construction – the Scope of Work for design services under construction may include:
  - a. Review of actual subsurface conditions to verify structural design.
  - b. Review and approval of shop drawings.
  - c. Changes in design based on field conditions.
  - d. Services as needed per PE stamp requirements on design drawings.
  - e. Answer questions as needed on plans and specifications.
  - f. Claim and schedule analysis.
  - g. Analysis of VE proposals.
  - h. Analysis of construction phasing false work, shoring, methods statements, and CPM schedules (Microsoft Project and/or Primavera).
  - i. Analysis of bridge demolition plans, girder erection plans, structural stability, Project Safety Management Plans, and Safety Critical work.
  - j. Field Visits, Meeting attendance, and re-design as needed.
  - k. Electrical and Mechanical Inspection for, in accordance with all applicable electrical and mechanical codes.
- O. Construction Management, Administration, and Inspection –The scope of work for Construction Management, Administration, and Inspection will provide these services on tunnel specific improvements that have been designed by other consulting firms or CDOT staff. These tasks may include
  - a. Provide Construction Project Engineer, Assistant Project Engineer, Inspectors and Testers in accordance with the requirements of the CDOT Construction Manual.
  - b. Provide specialist project personnel to provide professional services in the

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construction and installation of improvements. These personnel will have appropriate and verified professional expertise and experience as required for mechanical and electrical systems, ventilation, systems control, fire protection, underground structures and other tunnel specialties as required.

- P. Other Services -As requested by the Regions and specified in the task orders other services not specified above may be requested on an as needed basis. The scope of work for these services will include the details of the needs.
- a. Non-Destructive Testing
  - b. Monitoring
  - c. SCADA systems
  - d. ITS and electronic communications
  - e. Asset Management Activities