COLORADO
Department of Transportation

Non-Project Specific / Non-Task Specific General Engineering Scope of Work CDOT Front Range (Regions 1, 2, 4 and HQ)

Contract Administration:

General administration of these contracts will be delegated to the Regions by contract. Active day-to-day administration and monitoring of contract task orders will be delegated to Regional Resident Engineers or CDOT Project Engineers within each task order.

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

A. General Engineering Services - The scope for general engineering and design services may include but shall not necessarily be limited to:

1. Provide conceptual drawings, graphs, data collection, milestone dates, drawdowns, and/or charts for the region's planning, engineering, traffic, environmental, ROW, or other units as needed.
2. Conduct studies to support planning, transportation, environmental, etc. initiatives.
3. Provide stakeholder support, including assistance with public meetings, communities, and outreach.
4. Provide design support for on and off-system roadways, as well as alternative transportation modes.
5. Provide drafting support and/or CADD services. All CADD work for CDOT will be conducted using Bentley OpenRoads Software and configuration, latest versions used by CDOT.
6. Provide research support.
7. Provide appropriate assistance with railroad coordination as requested and required by the project team.
8. Understand and apply applicable and relevant CDOT bulletins, manuals, policies and procedures, standards, guidelines, approved product list, and other engineering standards and regulations to develop the best solutions for each project. Utilize relevant FHWA, AASHTO, and other criteria to compile a complete and quality contract set.
9. Provide non-standard engineering services that may not be defined in the Scope of Work.
10. Ensure all deliverables are American Disability Act (ADA) accessible to an extent that is reasonably possible and adhere to CDOT's latest guidelines.

B. Bridge/Structural Design Activities - The scope of work for bridge design activities may include:

1. Provide design services for various highway structures or portions of highway structures, including plans and specifications
2. Furnish detailing services including drafting and quantity calculations for various highway structures or portions of highway structures.
3. Inspect and rate highway bridges.
4. Provide detailed review of work performed by other designers.
5. Provide wall, concrete box culvert, and other major and minor structure design.
6. Provide structural selection reports and structure selection studies.
7. Provide a structure concept study.
8. Obtain structural data.
9. Provide foundation investigation report.
10. Coordinate with outside agencies, for example, railroad and irrigation agencies.

C. Roadway Design Activities - The scope of work for roadway design activities may include:

1. Provide design services including quantity calculations for the various components of roadway construction, which could include pavement resurfacing, pavement reconstruction, roadway widening, intersection layout, interchanges, signals, structures, lighting, landscaping, irrigation design, ditch design, waterline, and sanitary sewer design.
2. Furnish detailing and drafting services utilizing Bentley OpenRoads Software, latest CDOT adopted versions utilizing CDOT format. Other software required for design services and communication of information is Microsoft office products such as Word, Excel, Power Point, etc. In addition, ProjectWise, PMWeb, Google Drive or FTP sites may be required for file sharing, along with OnBase for archiving. Other formats or software products may be required for specific tasks such as traffic modeling, truck turning movements, and/or lighting design.
3. Attend scoping reviews, design office reviews, field inspection reviews, and final office reviews. Provide minutes as appropriate. Run or support these and other meetings, as appropriate, and prepare deliverables for the meetings when needed. Possibly provide office space and/or a virtual meeting platform to conduct these meetings.
4. Prepare final plans, specifications and estimate (PS&E) and that can be used for appropriate CDOT clearances, estimate entering (CDOT Trns-port and PMWeb application systems), and contract bidding and award.
5. Prepare Traffic Control Plans so the project can safely handle traffic during construction with engineer-stamped plans.
6. Provide Lighting plans that adhere to applicable standards.
7. Prepare revisions under-advertisement plans or specifications when necessary.

D. Traffic, Safety, and Operational Activities - The scope of work for traffic activities may include:

1. Provide services that include, but are not limited to traffic modeling, identifying safety and operational problem areas with associated mitigations, compiling crash and safety data for analysis and decision making, aid with intersection selection, and compiling safety reports.

2. Provide System Engineering Analysis (SEA) and Concept of Operations analysis and reporting to aid with deploying consistent and maintainable Intelligent Transportation Systems (ITS).

E. Hydrology Activities - The scope of work for the hydrology activities may include:

1. Collect historical drainage data from flood insurance studies, master plans and gage data, or other local or regional resources.
2. Establish drainage basin data, including un-gaged watersheds.
3. Select run-off parameters and predict peak flows.
4. Perform floodplain evaluation and management.

F. Hydraulics Design Activities - The scope of work for hydraulics design activities may include:

1. Furnish the size, location, and type of drainage structures based on appropriate assumptions, analysis, and application.
2. Furnish storm sewer and culvert designs to adequately support the design and post-construction conditions and within the confines of the appropriate master drainage plans.
3. Furnish erosion protection design and NPDES requirements.
4. Furnish quantity calculations for drainage structures including irrigation and permanent BMP's for surface drainage.
5. Furnish design of water and wastewater systems.
6. Irrigation system designs including, but not limited to, typical ditches, traveling gun irrigation systems and other center pivot systems.
7. Manage/use HEC-RAS 2D.
8. Manage/use FEMA's "Overall 2D" requirements.
9. Create and/or provide CDOT approved drainage reports.
10. Evaluate floodplains and associated permitting with local and state agencies, as required by FEMA and the Colorado Water Conservation Board (CWCB).
11. Use applicable software to perform hydrologic analysis; determine applicable criteria and regulations; QA/QC.
12. Perform erosion and scour evaluation.

G. Landscape Architectural Activities - The scope of work for landscape architectural activities may include:

1. Determine the best value landscape applications or alternative(s), finalize concept(s) into plan and specification form.
2. Verify that an acceptable safe recovery distance exists between traveled way and all trees to be planted.
3. Coordinate all special permits that may be required.
4. Coordinate ROW requirements.
5. Submit the approved plan/special provisions for inclusion in the project plans and specifications.
6. Verify availability of plant materials and submit a letter to the CDOT/PM certifying that designated plants are available.

7. Provide recommendations for alternative landscape designs and recommendations for Best Management Practices (BMP) control measures for temporary and permanent erosion protection.
8. Provide stormwater plan sheets with BMP control measure locations and quantity calculations.
9. Design wetland mitigation areas.
10. Provide quantity estimates of native seeding and mulching for the plans.
11. Provide transects, soil surveys or other CDOT landscaping requirements.
12. Design water quality plans and provide certifications to adhere to latest requirements.

H. Geotechnical and Materials Services for Design - The scope of work for design services include:

1. Provide field sampling and testing of existing pavements and soils necessary for proper pavement design per the CDOT Pavement Design Manual.
2. Perform boring and subsurface geotechnical investigations for Structure Selection Reports.
3. Provide testing results used in the design process that are certified by a professional engineer.
4. Provide other geotechnical services as requested in writing, including but not limited to subsurface investigations, instrumentation, foundation reports, landslide evaluations, MSE wall designs, soil nail designs, pavement recommendation(s) and retaining wall designs.
5. Provide pavement design, Lifecycle cost analysis, and other necessary pavement design.
6. Provide geohazard risk assessments and mitigation measures.

I. Environmental Services - The scope of work for environmental services may include:

1. Review environmental conditions, determine required permits, help execute data and information to obtain permits.
2. Identify environmental impacts, provide delineation and mitigation recommendations for sensitive and protected resources.
3. Prepare and/or review environmental documents for CDOT projects.
4. Conduct and prepare environmental surveys, plans, studies, and clearance reports.

J. Design Services under Construction – the scope of work for design services under construction may include:

1. Provide support during construction that may require assisting the contractor with clarifying questions and/or constructability and answering Requests For Information (RFI).
2. Review and approve shop drawings.
3. Provide a redesign to address a change in field conditions.
4. Provide services requiring a PE stamp on design drawings and/or plans.
5. Provide schedule analysis using Microsoft Project, Primavera, or other software.

6. Provide Dispute Resolution Board (DRB) support and analysis.
7. Provide analysis of construction phasing false work, shoring, methods statements, and other plans.

K. Utility Investigation, design, and Subsurface Utility Excavation (SUE) Activities – the scope of work for utility investigation may include:
   1. Conduct and document an investigation of the project area to determine existing utility conditions within the project limits. As part of the investigation the Consultant will meet with all utility providers and collect utility key maps for all utilities in the project area, identify all known utilities, ownership, type, size and special conditions should utility relocation be required, and research and obtain copies of utility easements (public and private) and utility franchise agreements to determine conditions under which the utility was established in its present location (e.g. by revocable permit or by a privately owned easement. The utility investigation requirements are to meet Quality Levels A and/or B as required under CI/ASCE 38-02 when required. Include notes on utility appurtenances / features, aboveground features, rim elevations, etc. Work with the CDOT PM to most cost effectively and efficiently comply with SB18-167.
   2. Model utilities in CADD using Bentley OpenRoads Designer, including elevation information / assumed depths based on best available information. CADD information must be formatted to be readily imported into cross sections of the roadway in Bentley OpenRoads Designer.
   3. Review utility location information with CDOT project manager, roadway engineer, and structural engineer to verify all required utility locates are addressed.
   4. Determine potential utility conflicts based on project engineering designs, utilizing the CDOT Utility Conflict Matrix to summarize information. Coordinate with CDOT project manager, utility owners, CDOT Region Utility Engineer, and appropriate design discipline leads to avoid, relocate, or otherwise manage each utility conflict location.
   5. Pothole and survey utilities at locations coordinated with CDOT project manager, utility owners, CDOT Region Utility Engineer, and appropriate design discipline leads.
   6. Prepare documentation needed and assist or perform utility permit preparation for reimbursable utility relocations, including utility relocation cost estimates and utility relocation design preparation.
   7. Prepare final sealed existing utility / SUE sheets and CADD models. Follow all QLB A/B/C/D requirements per CI/ASCE 38-02, using project coordinate system
   8. Prepare utility relocation sheets summarizing proposed relocations as planned by utility owners. Design utility relocation details as needed for relocations to be performed by the CDOT contractor, including relocation design, plan sheets, and specifications.
   9. Prepare and help execute utility agreements.

L. Specialty Services – the scope of work for specialty services may include:
   1. Grant Pursuit and Writing

   a. Funding needs analysis – Work with CDOT to assess the validity of current funding priority areas and identify potential new priority areas for funding.
   b. Grant Funding Research – Conduct research to identify grant resources and applicability, including but not limited to federal, state, foundation, agencies and organizations that support CDOT'S funding needs and priorities.
   c. On-call Grant Research – In addition to the areas defined above other areas may be also identified through the Funding needs analysis process and throughout the duration of the contract.
   d. Grant proposal Development – Provide grant proposal writing services associated with the completion of grant applications on behalf of CDOT, including the preparation of funding abstracts, production and submittal of applications to funding sources, and benefit-cost analysis.
2. Value Engineering Workshop and Study
   a. Provide value engineering on projects that may warrant a value engineering study to refine and or justify the design and construction approach.
   b. Provide a team and possible location to facilitate the study with subject matter experts and write a report(s) to satisfy federal and state criteria.
3. Project Decision Selection Matrix (PDSM) Services
   a. Provide services to facilitate, moderate, and/or participate in the preparation and workshop to formally select a project delivery method.
   b. The work may include documenting data in appropriate forms, facilitating the process, and finalizing evaluation worksheets.
4. Public Information Support
   a. Provide a person/team that is capable and has experience in working with key stakeholders and messaging key program and project objectives.
   b. Provide social media posts and videos to update project progress and inform roadway users of critical meetings and workzone information.
   c. Ensure all information is ADA accessible.
5. Financial Plan Support - Aid in compiling Financial Plans according to the Federal Highways Administration guidelines and other applicable standards.

M. Graphic and GIS Support Services – the scope of work for graphic and GIS services may include:
   1. Provide professional graphics that aid CDOT in conveying key messaging to internal and external stakeholders.
   2. Provide professional GIS services that transforms data into GIS layers to identify patterns and aid in decision making and key messaging.

N. Surveying, Drone, & Right of Way Services – the scope of work for survey, drone, and ROW services may include:
   1. Provide professional drone flights according to current regulations and guidelines for purposes including but not limited to surveying, photography, quantity estimating, environmental delineations, and capturing current and future conditions. (Chapter 4, Section 4.10 of the CDOT Survey Manual outlines all required procedures in use of UAS on CDOT projects. By reference the Section calls for FAA Part 107 compliance.)

2. Provide surveying services appropriate to the level of surveying needed for the project to collect and process data for design use. Surveying types include but are not limited to LiDAR, setting control points, and ground surveying.
3. Provide right-of-way services that include oversight and coordination management and drafting, execution and delivery of right-of-way plans.

O. Program Delivery Support – the scope of work for program support may include:
   1. Provide scope, schedule, drawdown, and cost estimating, to aid in program delivery management, decision-making, priority alignment, and communication.
   2. Understand financial opportunities and potential funding streams and align them with delivering the most impactful work.

P. Blended Team/Integrated Team Support – the scope of work for blended teams may include:
   1. Assimilate CDOT staff into the engineering team to provide technical and soft skill guidance needed for total project delivery, including project management skills to technical specialty skills.
   2. Guide CDOT staff through project inception to project completion and highlight key points to successfully deliver a project from “cradle to grave”.
   3. Assess the appropriate place for the CDOT employee to be integrated into the team based on experience and skills to promote a structured learning environment, as well as ensure a quality plan and specification delivery.
   4. Develop a progression plan that identifies the CDOT employee growth with milestones and work activities to achieve advancement goals.
   5. Deliver a quality plan and specification package in tandem with CDOT employee(s). As a blended team, provide services to compile specification packages, write specifications when necessary, and review specifications, quantity estimates, pay items, and plans for completeness and synchronization.

Q. Other Services - As requested Design and/or General Engineering SOW by the Regions and specified in the task orders for 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 SOW and General Engineering Requirements.