

Request for Proposals (RFP)

Design – Professional Services

Scope of Work

Bakerville to EJMT WB Climbing Lane

Mile Point (MP) 215.3 to MP 221.3



PROJECT NUMBER: NHPP 0703-502

**LOCATION: Westbound I-70 between Bakerville and
Eisenhower-Johnson Memorial Tunnel (EJMT)**

PROJECT CODE: 24808

February 3, 2022

Colorado Department of Transportation
2829 West Howard Place
Denver, CO 80204



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INSTRUCTIONS

This Scope of Work is to serve as a template for the Colorado Department of Transportation (CDOT) to develop and negotiate solid contracts with Consultant teams on projects and tasks. The Consultant shall coordinate all activities, tasks, meetings, communications and deliverables with the CDOT/ Project Manager (PM) (or his or her designee) for this project. All submittals will be through the CDOT/PM or a designee, who will make appropriate distribution. Upon notice to proceed, the Consultant shall be responsible and will account for all effort contained in the Final Scope of Work.

This Draft Scope of Work has been reviewed by the Department and reflects a plan of approach based on the known goals. One factor determining the selection of a Consultant is the ability of that Consultant to analyze the project goals, evaluate the work elements, and formulate a work plan. This process may produce new approaches or modification to the project work elements. Because of that, all Consultants should be aware that the Final Scope of Work for a project will be produced with input from the selected Consultant



SECTION 1

PROJECT SPECIFIC INFORMATION

1.1 PROJECT BACKGROUND

I-70 Mountain Corridor Overview

The I-70 Mountain Corridor (the Corridor) traverses the Rocky Mountains of Colorado. The Corridor connects Colorado’s Front Range with mountain communities, recreational areas, and resorts that are important contributors to the quality of life and primary economic drivers for the state.

In addition to providing recreational travel, the Corridor serves as a critical freight corridor in Colorado. Heavy vehicles (trucks, buses, and recreational vehicles), rely on the Corridor for the movement of goods and materials from both the east and west, as no alternative routes exist. Speed differentials between heavy commercial freight and faster moving vehicles cause significant mobility and operational challenges, particularly in areas of steep grades.

I-70 PEIS and ROD: 2011

The Bakerville to EJMT Climbing Lane Project is part of a “specific highway improvement” included in the I-70 Mountain Corridor PEIS Preferred Alternative and approved in the Tier 1 NEPA Record of Decision (“ROD”). All information associated with the I-70 PEIS and ROD is available at:
<https://www.codot.gov/projects/i70mountaincorridor/background-and-resources.html>.

Project Status

Preconstruction funding has been secured for this project through Senate Bill 267 and National Highway Freight Program. CDOT is moving forward from previously completed efforts with conceptual design, NEPA, stakeholder engagement, and final design for the project.

1.2 PROJECT LIMITS

This project is located on WB I-70 between approximately MP 215.3 (the EJMT WB entrance) and approximately MP 221.15 (the Bakerville Exit WB on-ramp) in Clear Creek County.

1.3 PROJECT GOALS

The following CDOT Project Goals reflect the values that this Project holds and expects. An exceptional proposal will demonstrate how the Proposer will pursue each of the Project Goals.

A. Improve Safety, Mobility, and Operations

- Enhance safety through reduced congestion.
- Improve emergency response time.
- Achieve a higher level of service.

B. Environmental Stewardship

- Minimize impacts to environmental resources identified in the NEPA process.
- Adhere to all environmental compliance requirements, including those documented in the I-70 Mountain Corridor PEIS/ROD commitments and stakeholder agreements.
- Implement innovative methods for environmental stewardship aligned with the project scope, schedule, and budget.

C. Minimize Construction Impacts

- Minimize impacts to the traveling public, residents, and business owners during construction.



- Minimize impacts to the surrounding USFS (US Forest Service) Land.
- Maintain access to recreation and jobs along the Corridor.
- Maintain a consistent and reliable communication system for disseminating information using accurate, meaningful, and timely communication strategies.

D. Optimize Scope, Schedule, and Budget

- Balance schedule and budget to maximize the scope and potential benefits of the project.
- Utilize innovation and manage risk to recover budget to reinvest in the project.

E. Stakeholder Involvement and Decision Making

- Foster collaboration with partners, stakeholders, and all members of the project team throughout the design process.
- Implement and utilize the I-70 Mountain Corridor CSS process to incorporate innovation throughout the project.

1.4 PROJECT COST AND FUNDING

The planning level total project cost estimate is \$32,000,000.

Currently, \$4,000,000 in funding has been identified for preconstruction efforts. A portion of this funding will be used for this contract. Preconstruction funding sources include \$2,500,000 from Senate Bill 267 (SB 267) and \$1,500,000 from the National Highway Freight Program (NHFP).

Construction funding for the project has not been identified at this time.

1.5 PROJECT APPROACH AND INFORMATION

Project Approach:

The delivery method for the project has not yet been determined. The intent of the preliminary design process is to establish an overall project footprint, and identify potential impacts that will aid in the determination of the best-suited project delivery method prior to final design.

The Consultant shall follow guidance and processes as defined in CDOT’s Alternative Delivery Program to perform a Project Delivery Selection Analysis and select the most appropriate delivery method for the project. If the Project Team does select an alternative delivery method for the project (either CMGC or Design-Build), the Consultant shall complete all necessary additional documentation and requirements specific to the selected alternative delivery method.

Regardless of the selected delivery method, the Project Team will function under an “Owner-Client” relationship with each party united in the pursuit of achieving the project’s goals. There is potential for the Consultant selected through this RFP to be precluded from a future Design-Build or similar procurement process in the case that an alternative delivery method is identified for this project. However, the project will require support from the Consultant throughout the entire design process.

Additional project numbers and sub account numbers may be added to the Project, dependent on which delivery method is selected by the Project Team.

Information associated with CDOT’s Alternative Delivery Program is available at:
<https://www.codot.gov/business/designsupport/adp-db-cmgc>

Project Information:

The project proposes to add a WB auxiliary/climbing lane in a section of high traffic volumes and steep grades in the Corridor to address existing mobility and operational challenges and safety issues.



The goal of this project is to construct the below Project Scope Elements in their entirety to minimize impacts to stakeholders and the traveling public. The Project Scope Elements may be modified based on funding, Stakeholder input, or other design constraints.

Project Scope Elements

I-70 Westbound Mainline Scope:

- Addition of an auxiliary/climbing lane between the Bakerville Exit and the EJMT,
- Evaluation and accommodation of two existing chain stations, and associated utility work,
- Rock excavation,
- Reconstruction and/or widening of two bridges to accommodate the auxiliary lane,
- Guardrail improvements,
- Intelligent Transportation System (ITS) improvements and/or accommodations,
- Pavement resurfacing,
- Striping and Signing throughout the project limits,
- Utility improvements,
- Water quality features

1.6 PROJECT ROLES

Lead and Supporting Agencies: CDOT is the lead agency and Owner of the Project. Oversight is provided by Federal Highway Administration (FHWA).

Stakeholders: Potential project stakeholders are listed below:

- a) Project Leadership Team (PLT), Technical Team (TT), and Issue Task Force (ITF) members of agencies which may include:
 - Clear Creek County
 - Town of Georgetown
 - Town of Silverplume
 - Denver Regional Council of Governments (DRCOG)
 - I-70 Coalition
 - U.S. Army Corps of Engineers (USACE)
 - Federal Emergency Management Agency (FEMA)
 - Colorado Parks and Wildlife (CPW)
 - U.S. Forest Service (USFS)
 - Environmental Protection Agency (EPA)
 - U.S. Fish and Wildlife Service (USFWS)
 - Federal Highway Administration (FHWA)
 - Colorado Department of Public Health and Environment (CDPHE)
 - Colorado Motors Carrier Association (CMCA)
 - Loveland Ski Area
- b) Recreational Users
- c) Traveling public
- d) Others as needed

1.7 WORK DURATION

The time period for the work described in this scope is estimated to begin March 1, 2022 and end December 1, 2023. The funding deadline tied to the \$2,500,000 SB 267 preconstruction funds requires these dollars to be spent by June 2023. It is CDOT’s goal to start construction on this project in CY 2024.



1.8 CONSULTANT RESPONSIBILITY AND DUTIES

All work shall be in accordance with CDOT's latest manuals, directives, and generally accepted practices. All work shall follow the I-70 Mountain Corridor CSS Process. The Consultant shall supply Engineer signed and sealed electronic plans and reports.

The Consultant will develop an all-encompassing scope of the Project and prepare a written recommendation of activities that coincide with the Project costs, goals, and planned improvements.

The Consultant is responsible for developing complete Plans, Specifications, and Cost Estimate (PS&E) packages of the planned improvements. Additionally, the Consultant is required to develop concepts and associated quantities to create cost estimates to assist with CDOT decision making. The work will include but is not limited to, the design of the roadway improvements, structural design, environmental, traffic, hydraulics, geohazards/geotechnical, rock cut, survey, utility, ITS, and water quality design.

The Consultant shall work closely with the CDOT Project Manager, and will be required to collaborate with stakeholders, and ITF groups.

The Consultant shall be prepared for the following duties:

- Provide a full time Project Manager and Project Team capable of providing project deliverables on time
- Program Management
- Project Coordination
- Meet all project milestones
- Participate in public outreach meetings
- Create and maintain CPM schedules
- Develop concepts, quantities, and cost estimates
- Attend site meetings and site visits
- Environmental NEPA Process and Documentation
- Provide FIR, DOR, FOR, and final project design, specifications, and quantities
- Provide phasing and detour concepts that will meet project goals
- Alternative Project Delivery Procurement Documents and Support
- Track project action items and deliverables
- Create and maintain a project risk matrix
- Create and maintain a project communication log
- Perform and document quality management activities
- Perform and document contract management including earned value analysis
- Develop and maintain a project change log
- Develop and maintain a project decision log
- All other efforts and deliverables as indicated in this contract

1.9 PERSONNEL QUALIFICATIONS

- The Consultant PM must be approved by the CDOT Contract Administrator.
- Certain tasks must be done by Licensed Professional Engineers (PE) or Professional Land Surveyors (PLS) who are registered with the Colorado State Board of Registration for Professional Engineers and Land Surveyors. National Institute for Certification in Engineering Technology (NICET) or other certifications may be required for project inspectors and testers.
- All tasks assigned to the Consultant must be conducted by a qualified person on the Consultant team. The qualified person is a professional with the necessary education, certifications (including registrations and licenses), skills, experience, qualities, or attributes to complete a particular task.
- This contract requires that the prime firm or any member of its team, be pre-qualified in the following disciplines for the entire length of the contract:



- AC – Acoustical Engineering
- AR – Architecture
- BI - Bridge Inspection
- BR – Bridge Design
- CE – Civil Engineering
- EL – Electrical Engineering
- EN – Environmental Engineering
- GE – Geotechnical Engineering
- GL – Geological Engineering
- HD – Highway & Street Design
- HY – Hydraulics
- LA - Landscape Architecture
- MA – Management (Contract Admin)
- ME – Mechanical Engineering
- MT - Materials Testing
- SE – Structural Engineering
- SO – Soils Engineering
- SU – Surveying
- TP – Transportation Engineering
- TR – Traffic Engineering
- VE – Value Engineering

1.10 COMPUTER SOFTWARE INFORMATION

The Consultant shall utilize the most recent CDOT adopted software (if applicable). The primary software used by CDOT is as follows:

- Earthwork - OpenRoads Designer – Bentley Systems
- Drafting/CADD - OpenRoads Designer – Bentley Systems with CDOT’s formatting configurations and standards.
- Survey/Photogrammetry - CDOT TMOSS, OpenRoads Designer – Bentley Systems, allowable systems in the CDOT Survey Manual
- Bridge -Please refer to the CDOT Bridge Design and Rating Manuals for software and other requirements for CDOT submittals.
- Estimating - Transport (an AASHTO sponsored software) as used by CDOT
- ProjectWise (a/k/a ProjectWise Explorer or ProjectWise Cloud)
- Specifications - Microsoft Word
- Scheduling - Microsoft Project or Primavera
- Water Quality Data – ArcView
- 3D graphic imaging - As approved
- B2GNow System for DBE/ESB tracking and prompt payment
- Pavement Design - Please refer to the CDOT M-E Pavement Design Manual for software and other requirements for CDOT submittals.

The data format for submitting design computer files shall be compatible with the latest version of the adopted CDOT software as of Notice to Proceed for the contract. The Consultant shall immediately notify the CDOT/PM if the firm is unable to produce the desired format for any reason and cease work until the problem is resolved.

1.11 PROJECT COORDINATION

The Consultant will be required to provide primary coordination with the CDOT/PM and specialty units as approved. There is an extensive list of potential stakeholders for this project listed in **Section 1.6 Project Roles** in this SOW.



1.12 SUPPLEMENTAL WORK

Work on other investigations, coordination and design tasks as related to the project and as directed by the PM shall be limited to the available budget to complete them under the approved task order (TO). The Consultant shall not perform work out of scope without prior written approval from the PM. Per the contract, subconsultants and vendors may not go over task order or contract budget.

1.13 WORK PRODUCT

The following work products include reports, studies, field investigations, and professionally engineered design of the following. The State shall retain all work products and backup materials, both in progress or completed. The Consultant work products may include:

- Project Management, and Coordination
- Preliminary Engineering Effort
- FHWA Value Engineering Requirements
- Utility Coordination
- Schedules
- Meeting Minutes
- CSS Stakeholder Coordination and Public Outreach efforts
- CSS Documentation and Lessons Learned
- ALIVE ITF Effort
- NEPA Documentation and Decision Document
- Survey
- Wetlands / 404
- Geotechnical Investigation
- Pavement Investigation and Design
- Structural Engineering
- Highway Design and Traffic/Safety Engineering
- Hydraulics and Hydrology
- ITS Components
- FHWA Controlling Criteria Variances
- Work Activity Assignments
- Field Inspection Review (FIR) 30% Plans and Estimates
- Design Office Review (DOR) 60% Plans and Estimates
- Final Office Review (FOR) 90% Plans, Specifications, and Quantities for estimates
- AD Plans, Specifications, Cost Estimate
- Construction Plan Package(s)
- Professional Engineer Stamped Record Sets
- Design Support During Construction
- Submittals
- Invoice Formatting and Information

Requirements are further described in the sections that follow. All work required to complete this Scope of Work requires the use of English Units.

1.14 ADDITIONAL PROJECT INFORMATION

Additional information regarding this project can be found in a Google Drive folder at the following link: bit.ly/BakervilleClimbingLane. The following documents are included:

- Drone video of existing project site conditions captured in October 2021
- Traffic Safety Assessment Report on I-70 between MP 215.3 – MP 221.5
- I-70 Mountain Corridor Aesthetic Guidance
- Linkage Interference Zone Reports
- As-Builts and other project related data



SECTION 2

PROJECT MANAGEMENT AND COORDINATION

2.1 CDOT CONTACT

The Consultant shall utilize the following project administration contacts for the Project:

- A. The Contract Administrator for this project is:
Benjamin Davis, P.E.
Resident Engineer
425A Corporate Circle
Golden, CO 80401
Phone: (801) 510-5929
Benjamin.davis@state.co.us

- B. Active day-to-day administration of the contract will be delegated to the CDOT/PM:
Maria Rocken
Project Manager
425A Corporate Circle
Golden, CO 80401
Phone: (303) 746-4677
Maria.rocken@state.co.us

2.2 PROJECT MANAGEMENT

The consultant shall supply Project Management services that meet the following requirements:

- 2.2.1** The Consultant shall provide the following for the overall interdisciplinary needs of the Project:
 - A. Project Manager
 - B. Engineering Task Lead
 - C. Environmental Task Lead
 - D. Stakeholder Management Task Lead

- 2.2.2** Attend CDOT/PM check-in meetings with all Consultant PM and Task Leads present as needed.

- 2.2.3** Provide monthly progress reports and invoicing, track progress of deliverables against the developed schedule, and ensure internal project controls are being followed. Utilize earned value management. If the project falls behind schedule, provide a plan to get back on track.

- 2.2.4** Assist with maintaining the CDOT Project webpage with appropriate updates.

- 2.2.5** Provide Project Management efforts in following areas at a minimum:
 - 2.2.5.1** Risk Management – develop and execute a plan for risk management which will include the following:
 - a) The plan for how to identify, track, analyze and respond to project risks.
 - b) Track risks and provide recommendations to either avoid, transfer, mitigate or accept individual risks to the project scope, schedule, and budget.

 - 2.2.5.2** Roles and responsibilities
 - a) Maintain the contact list for the project and all stakeholders.
 - b) Document decision-making hierarchy for the project.

 - 2.2.5.3** Scope Management – develop and execute a plan for scope management including collecting requirements, defining, and validating project scope, and a plan for assessing scope changes.

 - 2.2.5.4** Contract Management – develop and execute a plan for contract management including working with the CDOT/PM to develop the task orders.



- a) The plan shall include planning, managing, and controlling the costs for the prime Consultant and the subconsultants to stay on track, on task and under budget.
 - b) Task orders will be written to define the task order scope. Notify the CDOT/PM about potential out of scope items.
- 2.2.5.5** Cost Management – develop the quantities required for the construction cost estimate at major project milestones.
- 2.2.5.6** Schedule Management – develop and execute a schedule management plan including:
- a) The plan to develop, maintain and communicate the project schedule for the time and resources on the project.
 - b) The schedule shall be a detailed schedule using one of the programs allowed in **Section 1.10** in this SOW tracking all major milestones, CSS process, and deliverables for the design process. The schedule shall be used as a baseline to track progress. If the schedule is at risk of slipping, notify the CDOT/PM and recommend options for schedule recovery.
 - c) The schedule shall be updated on a monthly basis.
- 2.2.5.7** Change Management – develop and execute a change management plan that will include the following:
- a) Define how project deliverables and documentation will be controlled, changed, and approved. Note how changes could affect the project scope, schedule, and budget.
 - b) Identify who should approve the changes and how they will be communicated and documented.
- 2.2.5.8** Communication Management – develop and execute a communication management plan. The plan shall include the following:
- a) The processes that are required to ensure timely and appropriate planning, collection, creation, distribution, management, control and monitoring of project information.
 - b) Ensure that project information is consistently distributed in a timely manner to the team members that need it in the appropriate format.
 - c) Meeting planning - Establish the frequency of meetings and the most effective team members to invite and attend
 - i. A goal is defined for each meeting
 - ii. For major meetings establish a meeting plan template defining who, what, where, when, why, how, etc.
 - iii. For all stakeholder meetings, including public, PLT, TT, ITF, small group stakeholder and others the following shall apply:
 - A public involvement liaison shall participate and be present
 - Public Meetings shall require distribution of post cards and newspaper advertisements prior to the meeting to make the public aware of the meeting
 - Provide an individual employee to specifically record notes and meeting minutes
 - Specific Coordination Meetings shall be planned for major stakeholder meetings like PLT, TT, ITF and Public meetings.
 - d) Track crucial project decisions in a communications log.
 - e) Provide communication as appropriate with internal CDOT Specialty units as directed by the CDOT/PM.
 - f) Contact and coordinate project needs with CDOT personnel and additional entities noted in **Section 1.6** of this SOW.
 - g) Document and report to CDOT/PM when items have been submitted for review and log and track responses.
 - h) Project Newsletters: Create and provide graphical email updates to the PLT, TT, and ITF stakeholders. Graphics shall be gathered from the entire project effort to report on each discipline/action that is progressing.
- 2.2.5.9** Quality Management – Develop and execute a quality management plan for all project deliverables. The plan shall include quality assurance and quality control:
- a) Ensure accuracy and elimination of errors reducing the need for rework.
 - b) Provide interdisciplinary oversight ensuring that the documents capture not only the correct detail but are tied to the larger overall picture/concept of the project.
 - c) Provide contract documents that take into consideration constructability and maintainability.



- d) Provide quality assurance practices to reduce defects in work products. If the Consultant completing the work is not the Prime Consultant, the Prime Consultant shall complete an additional quality assurance practice to ensure the goal of the work product has been met.

2.2.5.10 Action Items and Deliverables tracking:

- a) Track action items and note date assigned, date completed, item, and who is responsible.
- b) Provide management of Consultant team tasks and team members, including sub Consultants and vendors, and work or task leads. Report progress to CDOT/PM.
- c) Deliverables are part of the project schedule but require their own communication tool for tracking progress. Create a separate deliverable tracking log indicating planned due date versus actual date submitted. Report progress to CDOT/PM.

2.2.6 Routine Reporting and Billing

2.2.6.1 Coordinate all activities with the CDOT/PM.

2.2.6.2 See requirements for monthly billing in **Section 5** in this SOW.

- a) Reports and submittals: In general, all reports and submittals must be approved by the CDOT/PM prior to their content being utilized in follow-up work effort.

2.2.6.3 Provide Vendor backup as part of all executed Task Orders.

2.3 PRELIMINARY ENGINEERING AND CONSTRUCTION PLANS & SPECIFICATIONS

The Consultant shall follow the latest version of the CDOT Project Development Manual for project delivery procedures and requirements and follow all CDOT and FHWA required design guidelines and Procedural Directives. The Consultant shall act as the Engineer in Responsible Charge for all Traffic Control needs for design fieldwork as required to complete this SOW. Consultant shall supply a vendor for traffic control services. Submit a Method of Handling Traffic (MHT) to CDOT/PM for review. Coordinate fieldwork with CDOT Maintenance and any active construction projects to avoid conflicts.

The Consultant shall host the following meetings as part of the plan development process:

2.3.1 Project Scoping: Host a formal project scoping meeting to address the following items:

2.3.1.1 This Project requires the early identification of all required variables at the initial scoping meeting. The Consultant shall be familiar with the scope of improvements and the CSS process.

2.3.1.2 Establish and lay out the plan to deliver the project to construction.

2.3.1.3 Prepare a plan for preliminary quantities.

2.3.1.4 Prepare preliminary plan and profile of improvements.

2.3.1.5 Applicable traffic data and traffic review of scope items.

2.3.1.6 Environmental considerations.

2.3.1.7 Establish and confirm the design requirements for the following items:

- a) Typical sections
- b) Horizontal and vertical alignment
- c) Detour alignment
- d) Drainage and hydraulics
- e) Approach of project
- f) Aesthetic features
- g) Pedestrian and bicycle facilities
- h) Landscaping
- i) Lighting
- j) Major structures
- k) Minor structures
- l) Walls
- m) Pedestrians/recreation
- n) Signs/miscellaneous
- o) Safety
- p) ITS components
- q) Traffic control



- r) Access control
 - s) Source of materials
 - t) Roadway and roadside clearances
 - u) Erosion control
 - v) Pavement options
 - w) Wetland / 404 Permit
- 2.3.2 Host a formal Field Inspection Review (FIR) Meeting:**
- 2.3.2.1** The purpose of the meeting will be to ensure the project is on track. Plan level shall be at least 30% complete showing integration of all identified improvements.
 - 2.3.2.2** Provide a detailed preliminary cost estimate.
- 2.3.3 Host a formal Design Office Review (DOR) Meeting:**
- 2.3.3.1** The DOR package shall incorporate all the ongoing TT/ITF efforts.
 - 2.3.3.2** This shall be a 60% design development issue package that provides plan sheets and details for all of the planned improvements items.
 - 2.3.3.3** Identify required Project Specifications.
 - 2.3.3.4** Provide a preliminary detailed cost estimate with summary of approximate quantities.
- 2.3.4 Host a formal Final Office Review (FOR) Meeting:**
- 2.3.4.1** Address all comments from the DOR plan set.
 - 2.3.4.2** Update all plans and specifications to a 90% design development level.
 - 2.3.4.3** Provide a 90% design development cost estimate with summary of approximate quantities.
 - 2.3.4.4** Submit all required reports
 - 2.3.4.5** All TT/ITF efforts shall be completed

The Construction Plans shall be coordinated with the ongoing CSS stakeholder processes.

When applicable, the engineering and overall process must consider ALL of the proposed Project Scope Elements as part of the NEPA Evaluation and Decision Document and plan for their future implementation and mitigation measures such that one improvement does not preclude a future improvement. Traffic engineering expertise must be utilized for continued evaluation of options and alignments as well as interactions of the additional highway improvements.

In addition to the deliverables described above, the following are also required:

- 2.3.5 Final PSE:** Provide final Plans and Specifications for clearance and estimate prior to final AD set (99% Design Development Plans).
- 2.3.6 Final AD set of plans.** Provide 100% Construction Documents.
- 2.3.7 Revision under Advertisement Plans and Specifications:** Provide any revised Plans and/or Specifications under Advertisement as needed.
- 2.3.8 Final Signed and Sealed Plans and Specifications:** Provide final Engineer signed and sealed Plans and Specifications.

2.4 SURVEY AND RIGHT-OF-WAY COORDINATION

The Consultant shall follow the guidelines of the latest version of the CDOT Survey Manual. The manual defines the minimum specifications that shall be followed while performing surveys in order to secure an optimum degree of statewide uniformity in surveying, and to establish and maintain survey standards. It is a reference source for statewide surveying policies, procedures and information required to complete this SOW.

- 2.4.1** Complete the project Control with sufficient detail around structures and other improvement locations.



- 2.4.2 The surveyor shall coordinate and provide all other needs, such as surveying wetland flags, geotechnical borings or other field delineated areas by others to complete this SOW.
- 2.4.3 Obtain utility locates and field survey markings. Field survey the top of utilities at locations that are potholed. Coordinate with a pothole company for timing of survey.
- 2.4.4 The Consultant shall complete CDOT/PM Form 1217 to determine the precise survey limits.
- 2.4.5 Attend the Pre-Survey Conference.
- 2.4.6 Prepare and obtain "Permission to Enter Property" forms for the purpose of surveying within private ownership parcels.
- 2.4.7 Acquire a Special Use Permit from CDOT to survey within the right-of-way and travel lanes. This process includes the preparation of a traffic control plan, MHT, which conforms to the Manual on Uniform Traffic Control Devices (MUTCD) and CDOT M&S Standards and Policies and a certificate of insurance naming the Colorado Department of Transportation as additionally insured. Submit the MHT to the CDOT/PM and for Special Use Permit. If the surveyor already has a standing Special Use Permit with the State, still submit the MHT to the CDOT/PM for review. The Consultant PE shall be the Engineer in Responsible Charge of the MHT.
- 2.4.8 Land Survey/Boundary Survey will include tying aliquot, property, and other land monuments to the control survey. Prepare a combination Project Control/Land Survey Control Diagram showing graphical representation of the found aliquot, property and land monuments and their relationship to the project control. Tabulation of the coordinates and physical description of the found monuments and other physical evidence will be included.
- 2.4.9 Prepare TMOSS Topographic survey of designated areas
 - 2.4.9.1 Wetlands will be marked by Environmental Consultant and coordinated with the survey crew in the field on site. Flagged wetlands shall be surveyed.
 - 2.4.9.2 Designate and locate the Ordinary (visible) High Water Mark of Clear Creek.
 - 2.4.9.3 Provide utility locates for design purposes and above ground utilities. Provide inverts of manholes as is best reasonably possible.
 - 2.4.9.4 Survey all inverts of the storm sewer system and measure culvert size. Survey inverts/rims of all storm sewer inlets and manholes. Make note of pipe direction and sizes as they enter and exit the storm sewer system.
 - 2.4.9.5 Coordinate with CDOT Hydraulic Engineer if cross sections or flow lines of the river are required for Clear Creek.
 - 2.4.9.6 Determine Existing Right of Way and HED limits. Provide a DGN file of the existing Right of Way Model.
 - 2.4.9.7 Locate Geotechnical Borings.
- 2.4.10 Obtain Title Commitments for any private properties from which ROW or easements may be required.
- 2.4.11 Provide Survey Report.
- 2.4.12 Prepare right-of-way plans in CDOT format for impacted private properties and USFS property based on title commitments.
- 2.4.13 Attend a right-of-way plan review meeting (ROWPR) with the appropriate staff personnel from CDOT and finalize the right-of-way plans and legal descriptions for CDOT authorization.
- 2.4.14 Stake the proposed parcels and easements for appraisal purposes. A one-time staking effort may be assumed.



- 2.4.15 Once the proposed parcels have been acquired and CDOT has provided the recorded deeds, monument the new right-of-way lines within the project limits and deposit the final right-of-way plans in the Clear Creek County Clerk and Recorder's office as appropriate.
- 2.4.16 Submit all survey deliverables in MicroStation Open Roads (ORD) format.

2.5 PAVEMENT INVESTIGATION AND DESIGN

- 2.5.1 Perform a preliminary soil investigation at the determined location of the auxiliary lane, and at other locations as needed.
- 2.5.2 Prepare a Pavement Design Report.
- 2.5.3 Prepare a Pavement Justification Report.

2.6 GEOTECHNICAL INVESTIGATION

The goal of the Geotechnical investigation is to provide geotechnical recommendations for the structural design of bridges and other proposed structures, and for the design of cut slopes and embankments.

- 2.6.1 Provide CDOT standard Engineering Geology and Geotechnical Plan sheets as required.
- 2.6.2 Incorporate geotechnical mitigation requirements from the NEPA evaluation into project design and recommendations.
- 2.6.3 The elements of the work shall include recommendations for Pavement Design (coordinate with Regional Materials Program for final needs), foundations, retaining walls, culverts, landslide evaluation, cut slopes and embankments.
- 2.6.4 The Geotechnical Engineer shall work with the Aesthetic Effort and Landscaping to provide recommendations for aesthetic rock sculpting and blasting techniques. Identify areas where rock sculpting may be required, such as exposed roadside cut areas.
- 2.6.5 The Consultant shall follow the guidelines set forth in the latest CDOT Geotechnical Design Manual for the preparation of the Geotechnical Investigation Report. These include, but are not limited to:
 - 2.6.5.1 Standards for CDOT Geotechnical Work Table 2-1
 - 2.6.5.2 Accepted Geotechnical Software for CDOT Projects Table 2-2
 - 2.6.5.3 A full literature review. Various Geotechnical documents are available for the Consultant to review upon request.
 - 2.6.5.4 Field Reconnaissance
 - 2.6.5.5 Minimum Requirements for Subsurface Explorations Table 3-2 for:
 - a) Pavement Design
 - b) Foundations
 - c) Retaining Walls
 - d) Culverts
 - e) Landslide Evaluation
 - f) Cut Slopes
 - g) Embankments
 - 2.6.5.6 Follow the prescribed methods for subsurface exploration.
- 2.6.6 Refer to the latest CDOT Bridge Design Manual for other requirements and requirements for geology sheets.



- 2.6.7 Provide information on site conditions, subsurface conditions, groundwater, and geochemical properties with recommendations for spread footings foundations, drilled shafts, driven piles, and different wall types such as mechanically stabilized earth, typical cantilevered, soil nail/shotcrete, and other types as required by the Structural Engineer.
- 2.6.8 The Geotechnical Report shall include bore logs, summary of laboratory testing, retaining wall foundation recommendations, shallow foundation recommendations, deep foundation recommendations, global stability analysis, heave/settlement, construction recommendations, lateral resistance values. Coordinate with the Designer for any potential other needs prior to starting work. The report will include Engineering Geology sheets indicating location of borings.
- 2.6.9 Borings are anticipated to be advanced into competent bedrock though cobbles and boulders. Soil and bedrock samples will be collected by in-situ testing and sampling methods outlined in Section 3.6 of the CDOT Geotechnical Design Manual. Selected soil samples will be tested as needed to provide design recommendation.
- 2.6.10 The report shall identify geologic hazards, such as landslides and mine workings, in the vicinity of the project, and shall determine if these features will be impacted by construction. In the event disturbance of geologic hazards is anticipated due to construction, the Consultant shall recommend mitigation to reduce the risks of disturbance to the sensitive area.
- 2.6.11 Identification of geotechnical issues and concerns associated with locations.
- 2.6.12 Provide a draft report for CDOT specialty unit and PM review prior to issuing the final stamped version. Final engineer stamped versions are required.
- 2.6.13 Provide for the minimum FHWA and CDOT required number of borings/test holes per wall, bridge, poles, or other features as required. Alternate field collection methods such as geophysics and cone penetration testing can be used in place of borings at CDOT's approval.

2.7 STRUCTURAL ENGINEERING

Two existing bridges within the project limits, Structure F-13-O and Structure F-13-J, will require widening and/or reconstruction to accommodate the new climbing lane. The Consultant shall provide Structural Engineering services for the design and construction of these bridges, and other structural items as required including Structure Selection Reports.

- 2.7.1 Provide cost effective innovation and coordinate with the CDOT/PM for alternative selection. Collaborate with the aesthetic and landscaping requirements and the CSS process.
- 2.7.2 The Consultant shall follow the latest CDOT Bridge Design Manual Policies and Procedures. At the time of this SOW there is an April 2021 version.
- 2.7.3 Project scoping shall provide a comparative analysis between bridge widening/ rehabilitation work alternatives, and replacement alternatives for Bridges F-13-O and F-13-J. A life cycle cost analysis for the alternatives shall be provided to help confirm this determination. This shall be included in the Structure Selection Report submittal.
- 2.7.4 The Consultant shall provide inspection services on existing bridge structures.
- 2.7.5 The preliminary design for major and minor structures and other miscellaneous structures within CDOT ROW shall be conducted as required to ensure that CDOT obtains a structure layout and typical section that achieves the project's objectives and minimizes revisions during the final design and construction phases.



- 2.7.6 The Structure Selection Report is due by the FIR milestone.
- 2.7.7 Coordinate required recommendations with the geotechnical engineer.
- 2.7.8 The general scope of work includes, but is not limited to:
 - a) Bridge Replacement
 - b) Bridge Widening
 - c) Bridge Rehabilitation
 - d) Overhead signs
 - e) All applicable Wall structures i.e. retaining, noise etc.
 - f) All other Major/Minor structures, such as concrete box culverts
 - g) All other items typically attached that are placed on the above structures or used in conjunction with structures i.e. barriers (Bridge rail), Fencing, Special supports, etc.
- 2.7.9 Participate in the survey SOW needs.
- 2.7.10 This portion of the project will require a CSS aesthetic component.

2.8 HIGHWAY DESIGN AND TRAFFIC ENGINEERING

- 2.8.1 The Consultant shall provide geometric highway design and traffic engineering expertise for the Project Scope Elements.
- 2.8.2 The Consultant shall follow the latest version of the CDOT Roadway Design Guide, AASHTO A Policy on Geometric Design of Highway and Streets 2018, and the MUTCD.
- 2.8.3 Provide design of roadside elements, such as guardrail. Provide for Traffic and Safety Engineering recommendations.
- 2.8.4 Provide design of a roadway alignment to provide the most cost effective and safest layout that still meets the Project Goals and follows the core values defined in the CSS process. Document the safety revision and optimization effort in a final memo.
- 2.8.5 Provide traffic engineering expertise for crash reduction evaluation.
- 2.8.6 Provide detailed site grading expertise for the identifications of walls and conforming the roadway to the adjacent landscape. Coordinate efforts with the geotechnical, structural, and other areas of expertise as required.
- 2.8.7 Provide a Traffic Engineering Plan for management of traffic during construction for phasing purposes. Evaluate the current Region 1 Lane Closure Strategy and make recommendations for implementation on the Project.
- 2.8.8 Coordinate with Structural Engineer for Structure Selection Report requirements.
- 2.8.9 Provide recommendations for and layout of ITS components.

2.9 HYDRAULICS ENGINEERING

- 2.9.1 The Consultant shall adhere to guidelines in CDOT's Drainage Design Manual and applicable Procedural Directives for drainage design work.
- 2.9.2 The Consultant shall devise and implement a plan to inspect each culvert to assess its condition. Determine if the culverts can be used as is, need to be rehabilitated, replaced, abandoned, or rerouted. Provide an inventory and memorandum, based on the field reconnaissance, to the CDOT/PM. Review



- as-built information as part of the research effort.
- 2.9.3** Prepare detailed design work of rundowns to convey water from the roadway.
 - 2.9.4** Bridge Work: Prepare Hydrology and Hydraulic Drainage Reports. Follow the CDOT Drainage Design Manual and refer to chapter 10, Bridges.
 - 2.9.5** Hydrology:
 - 2.9.5.1** Determine the watershed hydrology
 - 2.9.5.2** Visit the site and obtain and review flood history and data
 - 2.9.5.3** Check for current floodplain studies and determine level of FEMA/CWCB level of coordination for a LOMR or LOMC if required
 - 2.9.6** Hydraulics Design Activities:
 - 2.9.6.1** Complete a water-surface profile
 - 2.9.6.2** Analyze bridge opening sizes
 - 2.9.6.3** Locate and place the bridge crossings
 - 2.9.6.4** Provide analysis and mapping of Base Flood Flows for 100 year and 500 year based on survey cross sections and assess impacts to surrounding property.
 - 2.9.6.5** Conduct a scour analysis
 - 2.9.6.6** Design revetment
 - 2.9.6.7** Provide required water elevations in the plan sheets
 - 2.9.6.8** Provide additional information as required by Region 1 Hydraulics Engineer (CDOT)
 - 2.9.6.9** Provide preliminary information, as noted above, for the FIR meeting
 - 2.9.6.10** Complete all documents for plans and reports as noted in the drainage design manual.
 - 2.9.7** Provide required plans per the CDOT Drainage Manual as well appropriate project specifications.
 - 2.9.8** Coordination between Hydraulics, Geotechnical and Bridge Engineer will be required for FIR/DOR/FOR submittal timing.
 - 2.9.9** Provide plans, specs, details, hydrology/hydraulic analysis, and drainage report of proposed storm sewer system per CDOT Drainage Manual.

2.10 ITS COMPONENTS

- 2.10.1** The Consultant shall provide all required expertise for all ITS components of the project which may include, but are not limited to:
 - a) VMS
 - b) Weather Stations
 - c) Blank Out Signs
 - d) Flashing median chevrons
 - e) CCTV Cameras
 - f) Fiber Optic Communications
 - g) Ethernet Network Gear
- 2.10.2** The Consultant shall provide design plans and specifications for all ITS components of the project.
- 2.10.3** The Consultant shall design ITS components such that they are fully and securely connected into the CDOT ITS Network and comply with all OIT CISP requirements.
- 2.10.4** The Designer shall coordinate with the High Performance Transportation Enterprise (HPTE) and CDOT ITS to determine the equipment and infrastructure needed for the Project Scope Elements.



- 2.10.5** The Consultant shall follow the federally required System Engineering Analysis (SEA) Process for all technology implemented on the project. Complete all required SEA Documentation throughout the design process. Refer to **Section 7 - Submittals** for SEA Documentation requirements.

2.11 UTILITY ENGINEERING

- 2.11.1** The Consultant shall provide all required expertise for areas requiring lighting and electronic components which may include, but are not limited to:
- a) Truck parking lighting
 - b) Chain station lighting and electronic signs
 - c) VMS
 - d) Variable Speed Limit signs
 - e) Chevrons
 - f) Integration of these systems into CDOT's fiber line and systems
- 2.11.2** The Designer shall provide design plans for all required utility installations for all ITS components of the project.
- 2.11.3** As part of the scoping process, prepare an assessment of all the utility needs and all Intelligent Transportations Systems (ITS) and Network Services.
- 2.11.4** Evaluate and determine whether SUE investigation is needed. If SUE investigation is needed, the Consultant shall follow CDOT SUE guidelines and provide SUE compliant plans following Senate Bill 18-167. If SUE investigation is not needed, the Consultant shall provide a SUE justification letter detailing this rationale.
- 2.11.5** Provide potholing for establishment of utility profiles and survey locations and depths where needed.
- 2.11.6** Design all relocations, and engage utility companies for the design of their facilities.
- 2.11.7** Coordinate scoping meetings with all utility providers and document meeting minutes.
- 2.11.8** Utility work should be completed prior to FIR (30% Design).

2.12 FHWA VALUE ENGINEERING EFFORT

At this time, CDOT does not anticipate the need for Value Engineering (VE) for this project. However, it is possible that changes in scope and/or cost during the design process may require VE for this project per FHWA Requirements. If that becomes the case, the Consultant shall follow the CDOT Project Development Manual and FHWA guidance to incorporate VE principles throughout the design process in order to maximize the project's benefits.

2.13 PROJECT COORDINATION

In addition to the stakeholders listed in **Section 1.6.**, the Consultant shall collaborate and coordinate with the groups below. Include the CDOT Project Management Team (defined below) in all coordination.

- Executive Oversight Committee
- CDOT Project Management Team
 - CDOT Program Engineer – Mike Keleman, PE
 - CDOT Design Project Manager – Maria Rocken
 - CDOT Design Resident Engineer – Ben Davis, PE



- CDOT Specialty Groups
 - Region 1 Materials
 - Region 1 Traffic
 - Region 1 Hydrology and Hydraulics
 - Region 1 Survey
 - Region 1 ITS
 - Region 1 Environmental
 - Region 1 Right-of-Way
 - Region 1 Utilities
 - CDOT Staff Bridge
 - CDOT Staff Geotech
 - CDOT Public Information Office
 - CDOT Operations Center
- Design Subconsultants
- CDOT Engineering Estimates and Market Analysis (EEMA) Group
- CDOT Maintenance Forces
- Headquarters and Regional Civil Rights Manager
- HPTE
- Bridge Enterprise

2.14 CSS STAKEHOLDER EFFORT

The goal of the CSS Stakeholder effort is to facilitate a collaborative approach to decision-making throughout the design and NEPA process. The CSS process will continue through all life cycles, including design, construction, and operations and maintenance.

This project will follow the I-70 Mountain Corridor CSS Process. The Consultant shall collaborate with CDOT and the stakeholders through this process and manage all the meetings and materials. Incorporate the CSS process into the design process to ensure that the correct decisions are made at the right time, with both the design and CSS process complementing each other while allowing each to move forward in a timely, unimpeded manner with no backtracking.

Listed below are anticipated Project Leadership Team (PLT) meetings, Technical Team (TT) meetings and Issue Task Force (ITF) meetings. Other CSS Stakeholder meetings may be required to complete the CSS process and integrate it into design.

- Project Leadership Team (PLT) Meetings
- Technical Team (TT) Meetings
- Issue Task Force (ITF) Meetings
- Stream and Wetland Ecological Enhancement Program (SWEEP) Meetings
- Emergency Response Meetings
- A Landscape Level Inventory of Valued Ecosystem Components (ALIVE) Meetings
- Preconstruction Public Meetings



SECTION 3

ENVIRONMENTAL PROCESS REQUIREMENTS

Note: This Section is not written specifically for an Environmental Impact Statement (EIS), Environmental Assessment (EA), or a Categorical Exclusion (CatEx), but includes elements that would be associated with any of these projects. As appropriate, and with the input and assistance of Region environmental personnel, the CDOT/PM should make this section specific to reflect the elements and level of detail for the EIS, EA, or CatEx, or post-NEPA activities (ensuring that all of the commitments within the NEPA document are implemented in the design package).

Use the most current version of the CDOT NEPA Manual when completing this section to assure that the level of detail and documentation included complies with CDOT expectations and requirements, and any other applicable state and federal laws and regulations. Nothing in this Section precludes federal, state or local agencies or officials from fulfilling their responsibilities under federal, state, or local laws and regulations, NEPA, as codified in 42 United States Code (USC), section 4321, et. Seq. or any of NEPA's implementing regulation.

3.1 CONSULTANT DISCLOSURE STATEMENT

40 Code of Federal Regulations (CFR) Section 1506.5(c) specifies that a disclosure statement to avoid conflict of interest must be prepared. If an environmental document is prepared with the assistance of a consulting firm, the firm must execute a disclosure statement.

3.2 PROJECT INITIATION

- 3.2.1 Environmental Scoping.** The Consultant shall coordinate and hold an early environmental scoping meeting as directed by the CDOT/PM. Attendees will include the Regional Environmental Project Manager, the Regional Project Manager, appropriate members of the Environmental Programs Branch (EPB), CDOT/PM, and staff from Right-of-Way, Maintenance, Hydraulics, Traffic, and Utilities, as appropriate. This task will include a meeting with CDOT and the local agency representatives to discuss the initial work efforts of the project.
- 3.2.2 Review Applicable Existing Documents.** Review project-specific documents or data related to the assessment of environmental, social, and economic resources and impacts in the project area that are determined relevant. Examples of relevant documents are previous studies, planning efforts, access management plans, safety assessments, and other traffic studies. These resources may be CDOT documents or may have been created by local planning agencies or municipalities. Consider engineering and planning elements completed in earlier Life Cycle Phases (Planning and Scoping).
- 3.2.3 Extent of Study Required for Resources.** Determine the extent of study required for each resource area. The extent of study can be defined in four categories: 1) complete analysis required; 2) short analysis to define resources/impacts; 3) no analysis required; or 4) analysis already completed (for example, by a previous study).
- 3.2.4 Preparation and Coordination of Requirements.** During the early coordination/scoping process, determine the effort required for the preparation and coordination requirements to allocate: 1) work to be completed by CDOT Region Staff; 2) work to be completed by CDOT Headquarters Staff; 3) work to be completed by Consultant or it's project partners; and 4) outside agency concurrence or approvals required.
- 3.2.5 Extent of Narrative Required.** For each resource, determine during the scoping phase the extent to which documentation is required for each resource. The level of documentation can be included in several ways, such as: 1) a complete analysis/documentation included in the text; 2) a summary of the analysis performed included in the text; 3) a statement that no impacts are expected; or 4) inclusion of



information and coordination/documentation, such as technical memoranda, reference/ annotated bibliography, in an appendix of the document, referencing the appendix in the body of the text. This will be detailed to the extent possible using information available during the scoping phase.

- 3.2.6** Project Study Area/Logical Termini. Preliminary project study area limits are established in **Section 1.2** of this SOW. Perform necessary research and data collection to propose a study area boundary for environmental resources and logical termini for use in scoping. In coordination with the CDOT/PM, prepare a recommendation to the FHWA for approval of the logical termini, if applicable. Perform necessary study to determine logical termini and independent utility of this project in relation to other concurrent projects on the I-70 Corridor.
- 3.2.7** Maintain a NEPA Administrative Record that adheres to the established process. Make available any and all parts of this Administrative Record to the CDOT/PM (or his or her designee), or the Colorado Attorney General's office (as requested) at any time during the project's duration. All materials associated with the project Administrative Record will be delivered when closing the project in the format specified by the CDOT/PM. Final project invoice payments to the Consultant are conditional upon the professional and complete delivery of these materials to CDOT's office. Given the extent of documentation collected for the NEPA process, it is required that the Consultant updates the record regularly and provides information to CDOT electronically. This includes documentation and evaluation of the CSS process.

3.3 ENVIRONMENTAL ANALYSIS AND DOCUMENTATION

Conduct Contextual Analysis. Determine the effort required to examine the transportation needs in the project area definitively and completely, develop and evaluate transportation alternatives following the NEPA process, and develop the appropriate NEPA documents. Submit all environmental documentation, technical reports and technical memos to CDOT. Some documentation may be required to be supplied to reviewers at CDOT EPB, and FHWA for early review as appropriate and necessary. Analysis shall include the project's consistency with the I-70 Mountain Corridor PEIS and Record of Decision.

- 3.3.1** Purpose and Need. Develop a solid Purpose and Need statement, reviewed, and approved by appropriate parties. The objectives of the project should be clearly identified and agreed upon early in the project process to prevent backtracking and limit schedule changes. Develop and refine, as necessary, to address information collected on the project during data collection, transportation analysis, and public and agency scoping and involvement. Review previously prepared studies to help direct Purpose and Need information as appropriate (e.g., local planning studies, engineering feasibility studies, etc.). Submit no more than five versions of the Purpose and Need for review and comment.
- 3.3.2** Alternatives Development and Evaluation. Develop a range of reasonable alternatives that will satisfy the Purpose and Need requirements of the project, including, but not limited to, those identified in earlier and ongoing studies of the area. The Consultant team, in coordination with CDOT and FHWA, will determine the design year to use for the project. Changes in the design year during the project may be subject to a SOW modification.
- 3.3.3** Evaluate Alternatives Impacts. The Consultant shall take into account the projected design-year traffic volumes and projected opening day traffic volumes for new facilities as developed for this SOW, or as modified through later studies and calculations by CDOT. Evaluate the impacts of these alternatives according to established guidelines and examine the degree to which these alternatives satisfy the Purpose and Need requirements of the project. Set out these evaluations both schematically and in narrative form for review within a reasonable time after the notice to proceed.
- 3.3.4** Alternatives Screening Process. Apply an alternatives screening process to identify the reasonable alternatives (practical or feasible from a technical and economic standpoint), which will be subject to a more detailed evaluation. Develop NEPA-appropriate evaluation criteria, and measures of effectiveness, and submit them for review and approval by CDOT and FHWA before beginning the screening process. Thoroughly discuss the rationale for eliminating alternatives within the



documentation.

- 3.3.5** Preliminary Design of Alternatives. For each alternative that passes the screening process, incorporate preliminary design to a level that clearly allows the identification of impacts within each environmental resource area. These alternatives may be carried through the entire analysis process until a decision document is written. If CDOT or another agency or Consultants performs selected alternative studies, the Consultant shall incorporate the results of these studies into the appropriate document.

3.4 COST ESTIMATES AND FINANCIAL ANALYSIS

- 3.4.1** Develop cost estimates and Financial Analyses. As part of evaluating reasonable alternatives in the NEPA document, including the No-Action Alternative, develop cost estimates and financial analyses at varying levels of detail throughout the process. Analyze basic engineering, preliminary engineering, construction engineering, construction, and operating/maintenance for the design life. Develop a funding package identifying the funding sources necessary to construct and maintain the projects.
- 3.4.2** Incorporate into NEPA Document. Review the cost estimates and financial analysis, provide supplemental analysis as needed to support the Preferred Alternative, and incorporate findings into the draft NEPA document.
- 3.4.3** Preliminary Construction Cost Estimates. Prepare preliminary construction cost estimates based on 30% design on alternatives identified during the NEPA process. Project right of way acquisition and project environmental mitigation costs shall be included within the cost estimate. Include enough detail to ensure a reasonable degree of accuracy for the level of design performed. Submit the estimates, including the year from which the unit costs were assumed, to CDOT's Project Engineer for review and approval. Incorporate the analysis into the NEPA document.

3.5 DATA COLLECTION, FIELD INVESTIGATION, MITIGATION MEASURES

The following analyses are required for each of the alternatives that pass the screening process. Summarize each resource concisely, focusing on the project issues of concern in the NEPA document. The scope shall define the level of documentation, project tasks, and project deliverables for each of the resource areas. Identify the required area and resources to evaluate and determine the early coordination/scoping process as discussed above, but may evolve over the life of the project as new information is discovered through analysis. Reference other projects within the study area (to make sure existing conditions are alike between both projects, understand future planned conditions within the study area, and to appropriately evaluate cumulative impacts to resources); these projects may be related to transportation, but may also be entirely unrelated to transportation (such as a new strip mall, school, park, apartment building, for example). As determined by the Consultant team, the Region, and EPB, a larger area is typically evaluated for cumulative effects. Ensure the use of Geographic Information Systems (GIS) for environmental data is in compliance with CDOT GIS standards. Provide all GIS data to CDOT in electronic format with the annual updates for the administrative record.

Incorporate relevant information in the NEPA document sections such as Affected Environment, Environmental Consequences, and Mitigation Measures. The Consultant may prepare technical reports in support of the project. Review and reference these reports as appropriate in the NEPA document. If new or unique resources are identified during scoping, modify this SOW to include these, as appropriate.

- 3.5.1** Existing Roadway and Major Structures
- 3.5.1.1** Evaluate existing conditions to assess the proposed design relative to the following:
- Existing roadway safety and structure condition
 - General traffic concerns
 - Geometry and conditions including cross-sections, shoulders, medians and lane widths
 - Noise walls
 - Americans with Disabilities Act (ADA) accommodations and compliance



- f) Guardrail
- g) Lighting
- h) Traffic Signal Devices
- i) Signage, signals, lighting, grades, speeds, components, and structures

3.5.1.2 Construction Requirements

- a) General construction impact (of temporary nature)
- b) Material pits
- c) Haul roads

3.5.1.3 Multi-modal Transportation

Document existing multi-modal transportation facilities including bike paths/lanes, sidewalks, alignments for transit (heavy rail, light rail, bus routes), transit stops/stations, and multi-modal centers. Include signage, signals, lighting, grades, speeds, components, and structures in the effort. Coordinate with the CDOT Division of Transit and Rail to obtain relevant data.

3.5.2 Geospatial Data. Assemble, store, manipulate, and display data for resources as needed.

3.5.3 Air Quality. Perform the necessary air quality assessment or modeling as required and provide the results for integration into the NEPA document and Air Quality Technical Report (with modeling data assumptions). These will include, but are not limited to, analysis or discussion of: NAAQS, & Mobile source air toxics (MSAT) — qualitative, greenhouse gases (GHG), climate change, construction issues such as fugitive dust emissions, and mitigation measures. No Conformity Analysis is required since the project is in an attainment area.

CDOT staff will lead coordination with the Colorado Department of Public Health and Environment Air Pollution Control Division (CDPHE-APCD) and U.S. Environmental Protection Agency (EPA) as necessary. The analytical methodologies (including number of intersections to be modeled) will be determined through the coordination. Analyze each Build Alternative and the No-Action Alternative for impacts through the appropriate design year. Develop mitigation commitments, as necessary. The Consultant shall get approval from the CDOT Region and/or EPB air specialist (and possibly FHWA staff) for any methodologies to evaluate hazardous air pollutants. Utilize the most current standard, accepted FHWA language for MSATs.

3.5.4 Geologic Resources and Soil. Perform and document in the NEPA Document, and a Geologic Technical Report, a thorough investigation of the project area to determine possible geologic influences on the alternative designs under consideration, or vice versa. Evaluate constraints, including but not limited to major excavations, unsatisfactory subgrade materials, present and potential subsidence, potential for rockfall, the presence of abandoned mine sites, etc. Include a description of the corridor water table (i.e., depth/gradient) in this report.

3.5.5 Water Quality

3.5.5.1 Identify the status of the water resources (quality, etc.) for the purposes of describing the “affected environment” before construction: ground water/aquifers, lakes, rivers, streams, and springs, locations of drinking water treatment plants and locations of sewage treatment facilities.

3.5.5.2 Identify water resource and quality impacts of the project during and following construction. Consider the project location and design concepts in relation to existing water resources including groundwater or alluvial waters or aquifers (particularly sole source), drainage ditches and other State Waters as defined by CDPHE Water Quality Control Division, aquatic as well as riparian habitat, and Sensitive Waters (Class 1 Aquatic Life, Recreation 1, and Water Supply, 303[d] listed, etc.).

3.5.5.3 Colorado Discharge Permit System (CDPS) design and permitting issues.

3.5.5.4 Develop a mitigation plan that includes conclusions of effects, permanent best management practices (BMPs), temporary/construction BMPs, erosion control measures, and definition of maintenance responsibilities.

3.5.5.5 Prepare a water Quality Technical Report.



- 3.5.5.6** Understand, Implement and Champion the SWEEP MOU.
 - 3.5.5.7** Identify project specific recommendations from the Clear Creek Sediment Control Action Plan and seek opportunities to implement as a part of proposed action.
 - 3.5.5.8** Floodplains Assessment
 - 3.5.5.9** Identify location of floodplains and any planned changes to the floodplains from adjacent development.
 - 3.5.5.10** Add information to environmental resource mapping of existing conditions.
 - 3.5.5.11** Determine the probable impacts of each alternative with respect to floodplains and drainage.
 - 3.5.5.12** Identify adverse effects on the project area with respect to floodplains and drainage for each alternative (including during construction and relative to actual operating conditions).
 - 3.5.5.13** Develop possible actions to mitigate for the adverse impacts and coordinate with roadway and structural designers.
 - 3.5.5.14** Analyze the impacts and mitigation. As part of the analysis, include a determination of significant impacts due to the following:
 - a) Single community access routes.
 - b) Risk for social or economic losses due to flooding.
 - c) Alteration of beneficial floodplain values.
 - d) Recommend preparation of Conditional Letter of Map Revision (CLOMR), Letter of Map Revision (LOMR) requirement
 - 3.5.5.15** Prepare a Floodplain and Drainage Assessment Report and incorporate appropriate water quality control measures and BMPs as per the CDOT MS4 permit, New Highway Development program. The Region or EPB specialist will review and finalize the report.
- 3.5.6** Wetlands
- 3.5.6.1** Wetlands Determination/Delineation:
 - a) Conduct a field evaluation for the presence of wetlands within the project study area. Use Global Positioning System (GPS) for this activity.
 - b) Delineate the boundaries and size of all anticipated jurisdictional and non-jurisdictional wetlands and waters of the US within the project area.
 - c) Prepare wetlands maps that delineate the wetland boundaries within the corridor.
 - d) Coordinate the findings with the CDOT Region and the USACE. Obtain jurisdictional determination of the wetlands from the USACE.
 - 3.5.6.2** Prepare a Wetland Finding Report. A CDOT EPB will review a draft report prior to finalization of the report. EPB shall approve the final version before it is included in NEPA document. The Consultant shall use the Functional Assessment of Colorado Wetlands (FACWet), as appropriate according to current CDOT procedures. Conduct a wetland assessment based on the NEPA document addressing the amount of permanent and temporary wetlands impacts and mitigation. Identify wetland mitigation as early as possible in the NEPA process. Evaluate mitigation sites for availability and suitability for wetland habitat.
 - 3.5.6.3** Understand, implement and champion the SWEEP MOU.
- 3.5.7** Vegetation and Noxious Weeds
- 3.5.7.1** Conduct necessary field surveys and identify vegetation and noxious weeds within the project area. Use GPS for this activity. Plot major vegetation zones/ecosystems, and weed locations and densities on a map.
 - 3.5.7.2** Perform an impact analysis.
 - 3.5.7.3** Prepare an Integrated Noxious Weed Management Plan.
- 3.5.8** Fish and Wildlife
- 3.5.8.1** Conduct necessary field surveys and identify fish, wildlife, and their habitat within the project area. Use GPS to identify habitat, as appropriate.
 - 3.5.8.2** Coordinate with the Colorado Division of Wildlife (CDOW) and US Fish and Wildlife



- Service (USFWS).
- 3.5.8.3** Perform an impact analysis.
 - 3.5.8.4** Develop appropriate mitigation measures.
 - 3.5.8.5** Prepare a Biological Resources Report.
 - 3.5.8.6** Understand, implement, and champion the ALIVE MOU.
- 3.5.9** Threatened and Endangered (T&E) Species
- 3.5.9.1** Write letters for the CDOT EPB Wildlife Program Manager’s signature to the Colorado Division of Wildlife (CDOW), US Fish and Wildlife Service (USFWS), and Colorado Natural Heritage Program (CNHP) requesting a T&E species list.
 - 3.5.9.2** Conduct necessary desktop and field surveys and identify T&E species and/or Designated Critical Habitat.
 - 3.5.9.3** Review existing planning documents to determine any existing Habitat Conservation Plans (HCP) for T&E species.
 - 3.5.9.4** Identify impacts to species and recommend mitigation.
 - 3.5.9.5** Based on affected environment and habitat, prepare the T&E species impact assessment.
 - 3.5.9.6** Develop a Biological Assessment for the USFWS if federally listed T&E species and/or Designated Critical Habitat will be impacted and if there is a federal nexus.
 - 3.5.9.7** Develop a HCP with the USFWS if T&E species and/or Designated Critical Habitat will be impacted and if there is a federal nexus.
 - 3.5.9.8** Identify any impacts and develop a mitigation plan to conform to requirements of the Endangered Species Act.
 - 3.5.9.9** Understand, implement, and champion the ALIVE MOU.
- 3.5.10** Historic Properties
- 3.5.10.1** Perform and provide the survey report for review by the CDOT Region Historian or EPB Senior Staff Historian, and incorporate the information into the NEPA document. Existing resources and lists are not meant to be exhaustive.
 - 3.5.10.2** Collect and Evaluate of Baseline Information as defined by Section 106 of the National Historic Preservation Act of 1966, as amended.
 - 3.5.10.3** Understand, implement and champion the I-70 Mountain Corridor 106 Programmatic Agreement.
- 3.5.11** Historic Clearance
- 3.5.11.1** Determine the area of potential effect (APE), in coordination with CDOT and the State Historic Preservation Officer (SHPO).
 - 3.5.11.2** Conduct a literature and records search for previously recorded historic resources in the Area of Potential effect (APE) at the Office of Archaeology & Historic Preservation (OAHP).
 - 3.5.11.3** Conduct an intensive architectural field survey of the APE and determine National Register of Historic Places (NRHP) eligibility for each resource 45 years or older. Potential resources include man-made structures, ditches, railroads, etc.
 - 3.5.11.4** Identify and coordinate with consulting parties (e.g., public, historic preservation groups, local historical societies, museums) regarding historic properties in the project area.
 - 3.5.11.5** Write a comprehensive Historic Resources Survey Report according to guidelines established by the OAHP to submit for review by the CDOT Region and/or EPB Senior Staff Historian.
 - 3.5.11.6** Determine potential impacts, both direct and indirect, to historic resources and recommend mitigation strategies to avoid, minimize, or mitigate impacts.
 - 3.5.11.7** Prepare correspondence as necessary for the CDOT Region and/or EPB Senior Staff Historian to submit to the SHPO.
 - 3.5.11.8** Identify any impacts and develop a mitigation plan to conform to requirements of the Endangered Species Act.



- 3.5.11.9 Prepare Section 4(f) documents as required.
- 3.5.11.10 Work with the CDOT Region historian or EPB Staff Historian to obtain any necessary approvals.
- 3.5.12 Historic Bridge Clearance (if applicable)
 - 3.5.12.1 Assist CDOT to research the Statewide Historic Bridge Inventory to determine the eligible or non-eligible status of bridges that may be in the project area.
 - 3.5.12.2 Prepare correspondence as necessary for the CDOT Region and/or EPB Senior Staff Historian to submit to the SHPO.
 - 3.5.12.3 If bridges that have been determined to be eligible or listed on the NRHP are present, develop alternatives to bridge replacement, including: No-Action, rehabilitation, build a companion structure, build a new bridge in a different location, and others dictated by the project circumstances.
 - 3.5.12.4 Collaborate with the CDOT Region and/or EPB Senior Staff Historian to develop a Memorandum of Agreement, if necessary, to mitigate adverse impacts to historic bridges for agency review and execution.
 - 3.5.12.5 Prepare an archival documentation or other creative mitigation of the bridge to mitigate adverse effects according to standards established by the OAHP.
 - 3.5.12.6 When applicable, prepare information for CDOT Adopt-a-Bridge program to mitigate adverse effects.
 - 3.5.12.7 Work with the CDOT Region and/or the EPB Senior Staff Historian to obtain any necessary approvals.
 - 3.5.12.8 Prepare Section 4(f) documents as required.
- 3.5.13 Archaeology
 - 3.5.13.1 Complete a review of historic Sanborn Fire Insurance maps and other appropriate archival sources to determine if the area may contain significant archaeological sites or features.
 - 3.5.13.2 If necessary, conduct an intensive field survey of the project corridor(s) and undertake site-specific test excavations to determine NRHP eligibility. The Consultant shall not undertake test excavations before consulting with CDOT.
 - 3.5.13.3 Complete laboratory analyses of all collected artifacts and ancillary specimens.
 - 3.5.13.4 Write a comprehensive survey report according to guidelines established by the OAHP.
 - 3.5.13.5 Develop a data recovery plan to mitigate potential adverse effects to significant archaeological localities, as appropriate and necessary.
 - 3.5.13.6 Coordinate the mitigation plan with the EPB Senior Staff Archaeologist, SHPO, and other required agencies.
 - 3.5.13.7 Conduct data recovery excavations at any significant archaeological site that cannot be avoided during construction.
 - 3.5.13.8 Analyze artifacts.
 - 3.5.13.9 Prepare and submit a Data Recovery Excavation Report, which describes, in a thorough and comprehensive fashion, the project results and the nature of the site in the context of the regional archaeological database. The report must also include site management recommendations in the context of the NRHP.
 - 3.5.13.10 Coordinate with Tribal consultation and support EPB Senior Staff Archaeologist as needed.
 - 3.5.13.11 Prepare Section 4(f) documents as required.
- 3.5.14 Paleontological Resources
 - 3.5.14.1 Perform a literature and museum fossil database search and field assessment.
 - 3.5.14.2 Determine the presence or absence of paleontological resources.
 - 3.5.14.3 Conduct an analysis to determine the scientific significance (research and/or educational value) of the resource.



- 3.5.14.4** If necessary, develop the Paleontological Technical Report, including mitigation proposals. The EPB Staff Paleontologist will review the report for adequacy.
- 3.5.14.5** Coordinate the mitigation plan with the EPB Staff Paleontologist.
- 3.5.15** Land Use
- 3.5.15.1** Collect, map and evaluate baseline information. Prepare information on land use and zoning, including maps of existing, planned and future uses.
- 3.5.15.2** Prepare land use mapping. Mapping may include parcel use categories such as land in public ownership, commercial, retail, wholesale, industrial, residential, vacant, mixed etc., which identifies jurisdictional boundaries, and land usage along each alternative. The Consultant may obtain information from Department of Local Affairs, from old Sanborn maps, from archival aerial photos, from the local city, town or County, and/or from field verification.
- 3.5.15.3** Identify any impacts or consequences to land uses and recommend appropriate mitigation measures as necessary.
- 3.5.16** Social and Economic Resources
- 3.5.16.1** Collect, map, and evaluate baseline information to investigate and document the effects of the project alternatives on community cohesion, safety and security, neighborhoods, and accessibility of facilities and services.
- 3.5.16.2** Investigate the effects of the project alternatives on commercial and industrial enterprises, employment, local tax base, regional earnings, etc. When relevant, utilize recent Census data. Perform this task at the regional and corridor level, as well as part of a cumulative effects analysis, as appropriate.
- 3.5.16.3** Identify any impacts or consequences and recommend appropriate mitigation measures as necessary.
- 3.5.17** Environmental Justice
- 3.5.17.1** Collect the necessary U.S. Census and other applicable data to identify existing low-income and minority populations, as well as adverse effects and mitigation measures or alternatives that would avoid or reduce the impacts according to environmental justice guidelines. Evaluate impacts to these communities using CDOT and FHWA guidance in accordance with Executive Order 12898. Identify beneficial effects of the project on these populations. The analysis will cross-reference other resources as appropriate (e.g., noise, air and water pollution, aesthetics, community cohesion, relocation impacts).
- 3.5.17.2** As part of the project's public participation or public involvement program, ensure that meaningful opportunities for all members of the community to provide input to the project exist. Document the degree to which affected low-income or minority populations have been afforded the opportunity to provide input in the NEPA process related to the development of purpose and need, alternatives analysis and screening, impact analysis, preferred alternative identification, and mitigation measures development.
- 3.5.17.3** Collaborate with EPB's Environmental Justice specialist to determine the level of Environmental Justice outreach activities necessary to obtain sufficient input from low-income and/or minority populations. Document all outreach efforts and input (or feedback) for low-income and/or minority communities within an Environmental Justice Technical Report.
- 3.5.18** Bicycle and Pedestrian Facilities
- 3.5.18.1** Research and identify existing and future planned bicycle and pedestrian facilities in the project area. Collect necessary data from project design documents, community transportation plans, local land developers, open space and park trails, or local governmental agency or community interest groups to determine if any facilities will be impacted, and as a result, what



mitigation is necessary.

3.5.18.2 If the corridor is a heavily traveled biking facility, the scope of work shall include meetings to coordinate with bike users throughout the NEPA process.

3.5.18.3 If Section 4(f) resources are impacted, reference Section 4(f) and 6(f) Evaluation.

3.5.19 Residential/Business/Right-of-Way (ROW) Relocation

The following activities will be performed and documented by a qualified member of the Consultant team, in coordination with the CDOT Region ROW manager (or designee), or Headquarters ROW specialist assigned to the project, in accordance with Title 23 CFR 710:

3.5.19.1 Prepare a table identifying and listing all potentially affected properties including, at a minimum, ownership names, property and mailing addresses, estimated areas of impacts, and indicating which alternatives impact each property. Submit this table to the CDOT Region ROW Manager for review, which may be included in the NEPA document (without personal property details) at the discretion of the CDOT Region and/or Headquarters ROW staff.

3.5.19.2 Perform a ROW field inspection of each short-listed alternative. Ascertain number of parcels, types of improvements, and possible issues (e.g., historic sites). Estimate family sizes for residential relocations.

3.5.19.3 Compile a ROW acquisition and relocation cost estimate.

3.5.19.4 Prepare a property ownership map based on tax records, which identifies ownerships.

3.5.19.5 Develop and document mitigation measures.

3.5.20 Transportation Resources

3.5.20.1 Develop traffic volumes using available traffic demand models; determine the design year during the scoping process for the project. Forecasts should be based on existing roadways and roadways that are committed to be constructed (that is, “No Action”—those that will be constructed regardless of whether the project in question moves forward). Develop future traffic forecasts for the No-Action Alternative and any build alternatives. Develop a technical report to summarize the travel demand forecast process.

3.5.20.2 Conduct existing and future traffic operations analysis for the No-Action Alternative and build alternative(s) to inform the design of the climbing lane. Complete analysis in accordance with the latest edition of the Highway Capacity Manual or similar methodology. The Consultant shall use a micro simulation software package (i.e., VISSIM, TransModeler, or others as approved by CDOT) to evaluate the operations of the entire roadway network and report the appropriate measures of effectiveness for the alternative(s). The selection of the software package for the required analyses will depend on the size and other characteristics of the network, the alternatives to be analyzed, and the measures of interest. At a minimum, analysis will consider existing traffic volumes, accident history, percent of truck traffic, directional splits on all arterials, turning movements at intersections, interchange and ramp characteristics, grade, travel/access patterns, level of service, delays, travel times and speeds, and areas of congestion. During the alternatives development and evaluation process, conduct the appropriate level of operations analysis on the alternatives considered. Develop a Transportation Technical Report to document results of the operations analysis.

3.5.20.3 Conduct safety analysis in accordance with Highway Safety Manual procedures based on data collected from CDOT Staff Traffic and Safety Branch and input from local emergency services and Colorado State Patrol; obtain weighted hazard index from CDOT/PM; evaluate trends; document safety issues and how to address them.

3.5.21 Utilities and Railroads

3.5.21.1 In coordination with the CDOT Region Utilities specialist, collect utility location key maps for all existing and planned utilities in the area. Conduct all field utility locates. Analyze the potential impacts on or from utilities in the project area as well as any appropriate mitigation measures.



3.5.22 Section 4(f) and Section 6(f) Evaluation

3.5.22.1 Inventory and map project area for Section 4(f) and/or 6(f) facilities.

3.5.22.2 Determine if any potential impacts or ROW acquisitions include Section 4(f) properties (e.g., publicly owned parks, recreational facilities, nationally significant historic sites, wildlife refuges) or Section 6(f) properties (those that have received Land and Water Conservation Funds).

3.5.22.3 Determine and evaluate project impacts on Section 4(f) and/or 6(f) properties using preliminary design information, and the necessary commitments for mitigation measures. Determine whether impacts qualify under the “de minimis” 4(f) use. Prepare an analysis that includes avoidance alternatives, discussion of prudent and feasible, least harm (if necessary), minimization, and mitigation related to Section 4(f) properties. This may include the development of a new alternative(s) as an avoidance alternative(s).

3.5.22.4 Determine if the Section 4(f) use could be evaluated as a De Minimis Finding. If so, prepare that documentation in consultation with CDOT Region or EPB Staff.

3.5.22.5 Prepare the Draft and Final documentation for Section 4(f) and/or 6(f) evaluation. This will go through the Region Planning and Environmental Manager (RPEM) to the EPB for review.

3.5.22.6 Prepare evaluation and coordinate reviews with RPEM and EPB staff for review by FHWA.

3.5.23 Farmlands

In coordination with the Natural Resource Conservation Service (NRCS), investigate and quantify the effect of the project alternatives on farmlands—determining whether farmlands in question are classified as “prime” or “unique,” as well as the extent to which impacts may affect local communities. Complete the US Department of Agriculture Farmland Conversion Form (Form AD 1006) as necessary. Develop mitigation measures, if applicable, for impacts.

3.5.24 Noise

3.5.24.1 Prepare a Technical Noise Assessment in accordance with the most recent CDOT Noise Analysis and Abatement Guidelines. Include the following in the analysis and the noise assessment document:

- a) Definition of relevant noise abatement criteria and identification of noise-sensitive land uses.
- b) Determination of existing noise levels (by measurement and/or modeling).
- c) Prediction of future traffic noise levels for all alternatives, including the No-Action Alternative, using FHWA’s current Traffic Noise Model.
- d) Determination of traffic noise impacts.
- e) Identification and evaluation of feasibility and reasonableness of noise abatement measures. Coordinate with Project Engineer concerning locations and heights of proposed abatement measures.
- f) Development of recommendations regarding noise abatement measures.
- g) Assessment of construction related noise issues.

3.5.24.2 Document the items above in a Noise Technical Report. Prior to beginning this work, the Consultant shall meet with CDOT to review the appropriate noise methodology. Submit the report to CDOT for review and acceptance. Incorporate the findings into the NEPA document.

3.5.25 Visual Resources

3.5.25.1 Identify and inventory the highway corridor landscape units/types/themes, and project view shed. Identify key views, including to and from the highway and other likely locations of viewers. Analyze existing visual resources, viewer response/exposure, and any impacts expected from the project. Reference Project Specific Areas of Special Attention and Aesthetic Guidelines. Recommend and develop mitigation measures for identified impacts.

3.5.25.2 When specified, investigate the following: natural areas (e.g. scenic landscapes such as national parks or forests), wildlife habitat, topography, major drainages, unique landforms,



soil types, plant communities. Quality (including vividness, intactness, and unity), viewer sensitivity/exposure (over space and time) and existing aesthetic liabilities.

3.5.26 Energy

3.5.26.1 Document the construction and operational energy requirements and conservation potential of various alternatives under consideration. Include a calculation of energy consumption during construction in the documentation.

3.5.27 Hazardous Materials

Perform and document the following Initial Site Assessment (ISA) and/or Modified Environmental Site Assessment (MESA) activities:

3.5.27.1 Conduct regulatory research that includes the collection, mapping and evaluation of data for the following resources:

- a) Hazardous Waste Lists compiled by U.S. EPA or CDPHE. Utilize a database provider if appropriate.
- b) Records kept by U.S. EPA or CDPHE on hazardous waste regulation violations or citations.
- c) Lists kept by the appropriate fire department.
- d) Available historic tax records which indicate past land use. Coordinate with property ownership and land use data research, such as Sanborn Fire Insurance Maps.
- e) Available historic aerial photos of the corridor (e.g., United States Geological Survey, public libraries, etc.).
- f) Historic topographic maps.
- g) Any pertinent records maintained by CDOT.
- h) Documented personal interviews, if approved by the CDOT/PM.
- i) Agency file reviews.

3.5.27.2 Analyze results of regulatory research and records review and identify potential impacts that construction activities may have on existing hazardous waste sites. Assess potential liability issues and hazards to the public and construction workers and develop potential mitigation options. Prepare the ISA/MESA Document to include the following:

- a) Prepare the draft and subsequent final ISAs to address comments provided by CDOT.
- b) ISAs will conform to American Society for Testing and Materials (ASTM) standards for Phase I reports (with limitations), and make a determination of the necessity of a Phase II report.
- c) Identify how the presence of hazardous waste locations may affect each alternative, including the no-action alternative. Use GIS mapping as appropriate.

3.5.27.3 Conduct In-Situ Tests via performing the following and providing a survey report, as determined on a project-specific basis:

- a) Select locations for soil boring/monitoring wells based on information obtained above, geologic review, and alignment considerations.
- b) Install monitoring wells, and obtain soil and water samples, and geotechnical and geologic data for chemical analysis.
- c) Perform asbestos and lead based paint testing as determined appropriate.

3.5.27.4 Perform Phase II site assessment if deemed important for the alternatives screening process.

3.5.27.5 Understand, implement, and champion the ALIVE MOU.

3.5.28 Cumulative Impacts

3.5.28.1 Evaluate the cumulative effects on resources, ecosystems and human communities for each alternative. The analysis will consider incremental impacts of each alternative in conjunction with all past, present, and reasonably foreseeable future actions, no matter what entity (federal, non-federal, local government or private) is taking or has taken the action. Develop the scope of the analysis in consultation with FHWA and CDOT. Base temporal and spatial boundaries on the natural boundaries of resources of concern and the period of time that the proposed action's impacts will persist.

3.5.28.2 Incorporate the analysis into the NEPA document. Identify mitigation measures specific to



cumulative impacts, as needed.

3.5.28.3 Incorporate standard FHWA global climate change language within every cumulative impacts section of the NEPA document.

3.5.29 Consistency with I-70 Mountain Corridor Record of Decision:

3.5.29.1 Provide analysis and documentation to show how the Project does not preclude the long term Preferred Alternative for the Mountain Corridor.

3.6 PUBLIC ENGAGEMENT AND AGENCY INVOLVEMENT

3.6.1 Develop an Agency Coordination Plan.

3.6.2 Prepare a Stakeholder Involvement Plan.

3.6.2.1 The plan shall support the Project Work Plan and the level of effort included in the plan shall reflect the complexity and expected controversy of the project.

3.6.2.2 Develop a stakeholder database.

3.6.2.3 Identify methods for public notification and dissemination of information, such as newsletters, flyers, postcards, web site, press releases, miscellaneous informational materials, etc.

3.7 NEPA DOCUMENTATION PROCESS

3.7.1 Preliminary Data Submission

3.7.1.1 Provide a report detailing all the data collected for the resources listed under “Data Collection, Field Investigation and Analysis” and “Environmental Analysis and Documentation” of this Scope of Work for the affected environment and impact sections of the NEPA document. The level of effort will be directly commensurate with the class of action and degree of controversy of the project. Revisit the Scope of Work for possible updates at the end of this Preliminary Data Submission task when more is understood about the impacts or analyses that will be necessary (determined during scoping and data collection).

3.7.2 Draft and Final NEPA Document Preparation

3.7.2.1 The Consultant shall assign a team leader qualified to (1) manage the NEPA process, (2) develop a schedule for document preparation, printing, review, and comment response, (3) direct the Consultant team in the following tasks in coordination with the CDOT Region, EPB, and FHWA. Refer to the CDOT NEPA Manual for the required number of copies to provide for document review for each phase of the NEPA process.

3.7.2.2 Distribute the internal draft NEPA document and relevant technical reports for review to a distribution list specified by CDOT. Prepare the draft NEPA document and relevant technical reports with each version. Provide effort for review cycles of the draft NEPA document and relevant technical reports. Coordinate and conduct no more than two comment resolution meetings for distribution list comments. Respond to comments promptly.

3.7.2.3 Lead the effort with the Project team to determine whether the “class of action” (CE, EA or EIS) decided upon during the scoping process is still valid after the impacts and mitigation measures have been determined. This should require no more than two meetings.

3.7.2.4 Determine review process to be used for the NEPA document.

3.7.2.5 Coordinate with CDOT, appropriate agencies, and FHWA to discuss the impacts and mitigation measures. Take necessary actions to resolve issues.

3.7.2.6 Prepare a NEPA document outline for review by CDOT and FHWA. Prepare no more than three versions of the outline. Submit the outline document(s) to CDOT, FHWA, and other appropriate agencies for review and approval.

3.7.2.7 Prepare and provide the complete draft NEPA document and relevant technical reports in



electronic format to CDOT. Provide effort for review cycles of the draft NEPA document and relevant technical reports for CDOT review. Coordinate and conduct no more than two comment resolution meetings for CDOT comments.

- 3.7.2.8** Prepare and provide the complete draft NEPA document and relevant technical reports to CDOT EPB. Provide effort review cycles of the draft NEPA document and relevant technical reports for CDOT EPB review. Coordinate and conduct no more than two comment resolution meetings for CDOT EPB comments. If deemed appropriate by the PMT and CDOT, the Consultant may conduct a concurrent review between the Region and EPB.
- 3.7.2.9** Prepare and provide the complete draft NEPA document and relevant technical reports to FHWA Colorado Division and FHWA. Provide effort for review cycles of the draft NEPA document and relevant technical reports for FHWA Colorado Division and FHWA Legal review. Coordinate and conduct no more than two comment resolution meetings for FHWA comments.
- 3.7.2.10** Distribute the draft NEPA document and relevant technical reports for review to a distribution list specified by CDOT. Prepare the draft NEPA document and relevant technical reports with each version including a comment/response period. Provide effort for review cycles of the draft NEPA document and relevant technical reports. Coordinate and conduct no more than two comment resolution meetings for distribution list comments.
- 3.7.2.11** After each review cycle, make appropriate revisions to each subsequent version, draft NEPA document and relevant technical reports until all comments are sufficiently addressed. Provide copies of each subsequent draft to CDOT for distribution to appropriate agencies, and FHWA. If needed, hold a review meeting to discuss review comments.
- 3.7.2.12** For the review cycles listed above, prepare a comment/response matrix for each draft NEPA document and relevant technical reports that describes how each comment was addressed. Distribute this matrix with each version of the draft document and relevant technical reports that CDOT and FHWA review.
- 3.7.2.13** Submit the NEPA document to CDOT for signature and routing to FHWA for approval.
- 3.7.2.14** Draft NEPA Document Distribution, Advertising and Public Review, Review and Concurrence, and Public NEPA Document Availability and Advertisement.
- 3.7.2.15** Provide the following services in coordination with the CDOT Region or EPB specialist or CDOT Public Relations specialist as appropriate.
- 3.7.2.16** Create draft and final text for the public Notice of Availability of the NEPA document and the date, time and location of the public hearing (if appropriate for NEPA document) for placement in all appropriate local papers and within the Federal Register (if for an EIS) and provide to the FHWA Operations Engineer for processing.
- 3.7.2.17** Follow the signature process outlined in the CDOT NEPA Manual.
- 3.7.2.18** Prepare all aspects of the project necessary for public review of the NEPA document and relevant technical reports, including placing the documents in libraries, on the project web site, and with agencies. For public dissemination the Consultant shall provide an agreed upon number of copies of the signed NEPA document.
- 3.7.2.19** Compile public comments in the format determined by the CDOT/PM.
- 3.7.2.20** Provide an electronic version of the NEPA document and relevant technical reports on the CDOT website in PDF, or other read only format.
- 3.7.2.21** Make revisions to the final draft NEPA document and relevant technical reports. Prior to preparing the signature copy, provide the resulting NEPA document and relevant technical reports to CDOT for distribution and final review. The Consultant shall submit a signature copy of the NEPA document and relevant technical reports to CDOT for signatures and routing to FHWA for approval, and then will provide copies of the signed final NEPA document to CDOT.

3.7.3 Public Hearing



Provide the following services, in coordination with the CDOT Region and EPB:

- 3.7.3.1** Determine location for public meeting and ascertain that facilities are ADA compliant and culturally neutral.
- 3.7.3.2** Advertise the public hearing meeting date and location.
- 3.7.3.3** Hire a translator, or sign language communicator, as needed.
- 3.7.3.4** Provide audio/visual equipment and support for presentations, as needed.



SECTION 4 EXISTING FEATURES

Note: This Section lists known features in the area. It should not be considered as complete, and should include, as appropriate, information from Section 2 Project Management and Coordination. The Consultant should be alert to the existence of other possible conflicts.

4.1 STRUCTURES

M.P.	STRUCTURE NUMBER	DESCRIPTION
216.19	F-13-P	I-70 Mainline Eastbound Bridge over US-6
216.19	F-13-O	I-70 Mainline Westbound Bridge over US-6
218.3	F-13-L	I-70 Mainline Eastbound Bridge
218.3	F-13-J	I-70 Mainline Westbound Bridge
221.25	F-13-T	Bridge over I-70 Mainline at Bakerville On/Off Ramps

4.2 UTILITIES

Anticipated Utility Relocation/Coordination:

- a) Fiber Optic/Communications (CDOT and Zayo)
- b) Electric (Xcel Energy and CDOT)
- c) Gas (Xcel Energy) at EJMT
- d) Other Communications (Lumen & MCI/Verizon & Comcast)
- e) Other unknown utilities may exist.

Contact Utility Notification Center of Colorado (U.N.C.C.) at 1-800-922-1987 or 811, or co811.org

4.3 IRRIGATION DITCHES

None Anticipated

4.4 RAILROADS

None Anticipated

4.5 PERMANENT WATER QUALITY (PWQ) CONTROL MEASURES

Existing Permanent Water Quality Features exist within the Project Limits. The Consultant shall evaluate each using current design criteria and determination made on incorporation.

4.6 WATER FEATURES

- Clear Creek
- Quayle Creek
- Kearney Gulch
- Watrous Gulch
- Herman Gulch
- Dry Gulch



4.7 HIGHWAY EASEMENT

There is an existing USPS highway easement along I-70 within the Project limits.



SECTION 5 GENERAL INFORMATION

5.1 NOTICE TO PROCEED

Work shall not commence until CDOT issues the written Notice-to-Proceed. Work may be required, night or day, and/or weekends, and/or holidays, and/or split shifts. CDOT must concur in time lost reports prior to the time lost delays being subtracted from time charges. Subject to CDOT prior approval, the time charged may exclude time lost for:

- Reviews and Approvals
- Response and Direction

5.2 PROJECT COORDINATION

See Section 2 – Project Management and Coordination.

5.3 ROUTINE REPORTING AND BILLING

The Consultant shall provide the following on a routine basis:

5.3.1 Coordination: Coordination of all contract activities by the C/PM

5.3.2 Periodic Reports and Billings:

5.3.2.1 All current CDOT Engineering Contracts policies, procedures and guidance shall be followed.

5.3.2.2 Consultant Invoicing Guidelines. Please provide the following seven sections and information in each invoice in the following order:

1. Form 1313
2. Invoice
 - a) Provide invoice in a similar format to the original Project Cost Worksheet (PCW)
 - Note each employee, time worked, multiplier, and fee
 - Sum total hours worked and labor, subtotal fixed fees, subtotal sub-consultants, subtotal vendor under prime (sub consultants should note their own vendors on their invoices), provide invoice total, total billed to date and total amount left on TO for Prime, Sub and Vendor for ease of tracking
 - b) Provide columns next to employees ensuring Consultant has reviewed for:
 - Employee on original TO
 - Employee on MPA and date
 - Employee added to TO by letter and date
 - Employee added to MPA Date and documentation
 - c) Provide a header for the invoice noting:
 - SAP OL#, SAP PO#, Invoice Date, Invoice #, Project # and subaccount #, current billing period, TO# and any other pertinent information.
3. Submit Progress Reports per the contract documents. The progress report shall also summarize all the work performed by the Prime, Sub Consultants and Vendors. Provide header as noted in 2c. Each item below requires a section in the Progress Report.
 - a) Monthly schedule update and report on progress of each work activity or milestone identified in the contract, to show the amount of work accomplished during the current month and the amount of work accomplished overall.
 - b) Earned value reporting on the time scheduled for each work activity or milestone identified in the contract to show planned time completion and actual times used to do the work.



- c) A description of the cause for delays beyond the planned completion of time of work activities or milestones within the project.
- d) A report on the cost incurred to date on each work activity or milestone contained in the contract and a comparison to the cost estimates for such activity or milestone. Monthly billings will include a monthly budget forecast sheet that shows invoicing from start estimated through completion tracking the project budget. In other words, verify the burn rate of prime, subs, and vendors to ensure they are on track and on task.
- e) A description of possible remedies to get activities or milestones that are behind schedule, back on schedule, and to get activities or milestones that are exceeding cost estimates, back within planned costs.
- f) Documentation of meetings that were held during the subject time period.
- g) A report on the participation of DBE Sub-consultants.
4. Letter(s) adding employee(s) to task order with all required information (should have been approved by CDOT/PM prior to any work done by employee per HQ Contract/Agreement Unit-see Add Employee Process document)
5. Labor backup – timesheets
 - a) The Prime, Sub-consultants and Vendors shall submit detailed hourly back up of effort noting time and date of activities and number of hours or costs. Submit lodging backup through ODC backup.
6. ODC backup – only submit documentation pertaining to the project and the invoice
 - a) Provide a summary of ODC cover sheet
 - Purpose of trip, Date of Trip, Who went
 - b) Mileage logs, per diem and/or meals documents (listing of days and rates or receipts for actuals), lodging receipts, receipt or documentation of other ODC items including vendor receipts/invoices.
7. Sub-consultant billings and Vendors - should have the same documentation as prime, except Form 1313, which is optional.

5.3.3 General Reports and Submittals: In general, all reports and submittals must be approved by CDOT prior to their content being utilized in follow-up work effort.

5.4 PROJECT DESIGN DATA AND STANDARDS

5.4.1 General: Appendix A provides a comprehensive list of state and federal reference material. However, Appendix A does not contain all local agency reference material that may be pertinent to some projects. The Consultant is responsible for obtaining and ensuring compliance with the most recent CDOT-adopted version of the listed references including standards and specifications, manuals, and software, or as directed by the CDOT/PM. Conflicts in criteria shall be resolved by the CDOT/PM.

5.4.2 Construction Materials/Methods: The materials and methods specified for construction will be selected to minimize the initial construction and long-term maintenance cost to the State of Colorado. Non-typical construction materials and methods must be approved in writing by CDOT.



**SECTION 6
WORK ACTIVITY ASSIGNMENTS**

Note: This list establishes the individual task responsibility. Those tasks identified as CDOT/Other should utilize an abbreviation system to indicate whether the task will be completed by CDOT or another agency (i.e. “C” for CDOT and abbreviations as provided below). The consultant shall maintain the ability to perform all work tasks that are indicated below by an ‘X’ in the consultant column, in accordance with the forms and conditions contained herein, and the applicable CDOT standards. Where appropriate, mark “N/A” for not applicable items.

PRECONSTRUCTION	CDOT/Other	Consultant	Notes
A. Project Initiation and Continuing Requirements:			
1. Initial Project Meeting	_____	X	
2. Independent Design Review	_____	X	
3. Project Schedule	_____	X	
4. Develop Design Criteria	_____	X	
5. Initiate Survey (Map Preparation)	_____	X	
6. Right-of-Entry and Permits	_____	X	
7. Traffic Control	_____	X	
8. Initial Submittals	_____	X	
9. Progress Meetings	_____	X	
10. Structure Review Meetings	_____	X	
11. Project Management	_____	X	
B. Project Development:			
1. Communication and Consensus Building	_____	X	
a. Contact List	_____	X	
b. Public Notices/Advertisements	_____	X	
c. General Meetings			
(1) Small Group	_____	X	
(2) General Public	_____	X	
(3) Project Review	_____	X	
d. Communication Aids			
(1) Graphics Support	_____	X	
(2) Newsletter	_____	X	
(3) Wall Displays	_____	X	
(4) Study Model	_____	X	
2. Project Review Team	_____	X	
3. Survey	_____	X	
a. Pre-Survey Conference	_____	X	
b. Survey Data Research	_____	X	
c. Secure Rights of Entry	_____	X	
d. Project Control Survey			
(1) Locate or establish HARN Stations	_____	X	
(2) Monumentation	_____	X	
(3) Project Control	_____	X	



<u>PRECONSTRUCTION</u>	<u>CDOT/Other</u>	<u>Consultant</u>	<u>Notes</u>
e. Supplemental Surveying	_____	_____X_____	
f. Accuracy Tests	_____	_____X_____	
g. Review (by Registered Professional Land Surveyor)	_____	_____X_____	
4. Conceptual Design	_____	_____X_____	
a. Aesthetics	_____	_____X_____	
b. System Feasibility	_____	_____X_____	
c. Alternatives Analysis	_____	_____X_____	Provide optimization of improvements
d. Final Alternatives Reports	_____	_____X_____	
e. Interchange Approval Process	_____	_____X_____	
5. Data Collection, Field Investigation, Mitigation Measures	_____	_____X_____	
a. Traffic Related			
(1) Traffic Study	_____	_____X_____	
(2) Accident Study	_____	_____X_____	
(3) Noise Study	_____	_____X_____	
(4) Air Quality	_____	_____X_____	
(a) Air Quality Monitoring	_____	_____X_____	
(b) Air Quality Analysis	_____	_____X_____	
(5) Alternate Transportation Sys.	_____	_____X_____	
b. Archaeology			
(1) Gather Data & Analysis	_____	_____X_____	
(2) Mitigation Implementation	_____	_____X_____	
c. Paleontology			
(1) Gather Data & Analysis	_____	_____X_____	
(2) Mitigation Implementation	_____	_____X_____	
d. Initial Geology Investigation	_____	_____X_____	
e. Water Quality			
(1) Quality Analysis	_____	_____X_____	
(2) Quality Monitoring	_____	_____X_____	
f. Ecological Assessment	_____	_____X_____	
g. Historical			
(1) Historical Bridge Clearance	_____	_____X_____	
(2) Historical Study & Clearance	_____	_____X_____	
h. Floodplain and Drainage Assessment	_____	_____X_____	
i. Right-of-Way			
(1) Early ROW	_____	_____X_____	
(2) ROW Review	_____	_____X_____	
j. 4(f)/6(f) Activity			
(1) Evaluation	_____	_____X_____	
(2) Clearance/Concurrence	_____	_____X_____	
k. Threatened and/or Endangered Species			
(1) Determination of Presence	_____	_____X_____	
(2) Implement Mitigation	_____	_____X_____	
l. Wetlands			



PRECONSTRUCTION	CDOT/Other	Consultant Notes
(1) Wetlands Determination	_____	_____X_____
(2) Wetlands Findings Report	_____	_____X_____
m. Hazardous Materials		
(1) Field Search	_____	_____X_____
(2) Research	_____	_____X_____
(3) Conduct in-situ tests	_____	_____X_____
(4) Analyze and Assess Impacts	_____	_____X_____
n. Existing Roadway/Major Structure	_____	_____X_____
o. Construction Requirements	_____	_____X_____
p. Aesthetic Considerations	_____	_____X_____
q. Utilities	_____	_____X_____
r. Economics	_____	_____X_____
s. Farmland	_____	_____X_____
t. Energy Usage	_____	_____X_____
6. NEPA Documentation Process	_____	_____X_____
7. Design Report Process	_____	_____X_____
8. Obtain Permits	_____	_____X_____
C. Preliminary Design:		
1. Design Field Surveys		
a. Presurvey Conference	_____	_____X_____
b. Survey Data Research	_____	_____X_____
c. Secure Rights of Entry	_____	_____X_____
d. Project Control Survey		
(1) Locate or Establish HARN Stations	_____	_____X_____
(2) Monumentation	_____	_____X_____
(3) Local Project Control	_____	_____X_____
e. InRoads TMOSS Survey Openroads Designer	_____	_____X_____
f. Terrain Survey	_____	_____X_____
g. Utility Survey	_____	_____X_____
h. Hydraulic Survey	_____	_____X_____
i. Material Survey	_____	_____X_____
j. Supplemental Surveying	_____	_____X_____
k. Survey Report	_____	_____X_____
l. Accuracy Tests	_____	_____X_____
m. Review (by Registered PLS)	_____	_____X_____
n. Wetland Boundary	_____	_____X_____
2. Traffic Engineering	_____	_____X_____
3. Materials Engineering		
a. Preliminary Soil Investigation	_____	_____X_____
b. Pavement Rehabilitation	_____	_____X_____
c. New Pavement Structure	_____	_____X_____
d. Pavement Justification Report	_____	_____X_____
e. Pavement Design Report	_____	_____X_____
f. Existing Bridge Investigation	_____	_____X_____



g. Foundation Investigation	_____	X
h. Geotechnical	_____	X
4. Hydrology/Hydraulics Engineering	_____	X
a. Hydrology	_____	X
b. Hydraulics	_____	X
c. Preliminary Hydraulics Report	_____	X
5. Utility Coordination	_____	X
a. Location Maps	_____	X
b. Reviews and investigations	_____	X
(1) "Potholing"-Excavation	_____	X
(2) "Potholing"-Surveying Utility Locations	_____	X
c. Relocation recommendations	_____	X
d. Ditch Company coordination	_____	X
6. Roadway Design and Roadside Development	_____	X
a. Roadway Design	_____	X
b. Roadside Development	_____	X
(1) Guardrail and delineator	_____	X
(2) Curb Ramps and Sidewalk	_____	X
(3) Landscaping	_____	X
(4) Sound Barriers	_____	X
(5) Bike paths	_____	X
(6) Chain up Stations	_____	X
(7) Rest Areas	_____	X
(8) Safety analysis	_____	X
c. Lighting Plan	_____	X
7. Right-of-Way	_____	X
a. Research	_____	X
b. Ownership Map	_____	X
c. Appraisal	_____	X
d. Acquisition	_____	X
8. Major Structural Design	_____	X
a. Structural Data Collection	_____	X
b. Structure concept study	_____	X
c. Value Engineering	_____	X
d. Structure Selection Report	_____	X
e. Foundation Investigation Request	_____	X
9. Construction Phasing Plan	_____	X
10. Preparation for the FIR	_____	X
11. Field Inspection Review	_____	X
12. Post FIR Revisions	_____	X



D. Final Design:		
1. Project Review	_____	X
2. Design Coordination	_____	X
3. Utility Coordination	_____	X
4. Hydraulic Design	_____	X
a. Data Review	_____	X
b. Storm Water Pollution Prevention Plan	_____	X
c. Major Structure Channel Design	_____	X
d. Final Hydraulics Report	_____	X
5. Interim Plans	_____	X
a. Initiate ROW Authorization Process	_____	X
b. Final Utility Plans	_____	X
6. Right-of-Way	_____	X
a. ROW Plans Content	_____	X
b. Title Insurance and Closing Services	_____	X
c. Authorization Plan	_____	X
d. Appraisal Staking	_____	X
e. ROW Plan Revisions (During Negotiations)	_____	X
f. ROW Acquisition	_____	X
7. Materials Engineering	_____	X
a. Materials Data	_____	X
b. Stabilization validity	_____	X
c. Stabilization Plan	_____	X
8. Traffic Engineering	_____	X
a. Permanent Signing/Pavement Marking Plans	_____	X
b. Signalized Intersections	_____	X
c. Traffic Control Plan	_____	X
9. Roadside Planning	_____	X
a. Landscaping	_____	X
b. Other	_____	X
(1) Sprinkler systems/Liquid Anti-Icing	_____	X
(2) Bike paths	_____	X
(3) Sound barriers	_____	X
(4) Chain up Stations	_____	X
(5) Rest Areas	_____	X
(6) Guardrail and delineator	_____	X
(7) Safety analysis	_____	X
10. Roadway Design	_____	X
a. Cut Slope and Embankment Design	_____	X
11. Final Major Structural Design	_____	_____
a. Structure Final Design	_____	X
b. Preparation of Structure Plans and Specifications	_____	X
c. Independent Design, Detail, and Quantity Check	_____	X
d. Bridge Rating and Field Packages	_____	X
e. Structure Final Review Plans and Specifications	_____	X



12. Construction Phasing Plan	_____	X	
13. Plan Preparation for FOR	_____	X	
14. Final Office Review	_____	X	
15. Construction Plan Package	_____	X	
16. Respond to Job Showing Questions	_____	X	
17. Revise Plans during Advertisement – if necessary	_____	X	
E. Corridor Management Support:			
1. Design Control	_____	X	
2. Information Services	_____	X	
3. Budget Planning Support	_____	X	
F. Value Engineering	_____	X	
SERVICES AFTER DESIGN			
A. Review of Shop Drawings	_____	X	
B. Construction Services			
1. Design support during construction	_____	X	
2. Diary	_____	X	
3. Documentation/justification	_____	X	
4. Progress reports	_____	X	
5. Calculations, drawings, and specifications	_____	X	
6. Daily time sheets	_____	X	
C. Post Design Plan Modifications			
D. Post Construction Services:			
1. Final earthwork determination	_____	X	
2. As-built plans	_____	X	
3. Revisions to Right-of-Way Plans (Excess Land)	_____	X	
4. Monument ROW	_____	X	
5. Set Property Corners (Remainders)	_____	X	
6. Deposit ROW Plans	_____	X	
E. Construction Engineering			
	_____	X	



**SECTION 7
SUBMITTALS**

SUBMITTALS	CDOT/Other	Consultant	Notes
A. Project Initiation and Continuing Requirements:			
1. Periodic Reports & Billings	_____	_____X_____	
2. Meeting Minutes	_____	_____X_____	
3. Project Schedule	_____	_____X_____	
4. Completed Specific Design	_____	_____X_____	
5. Survey Plan	_____	_____X_____	
6. Permissions to Enter (Form 730)	_____	_____X_____	
7. Traffic Control Plan	_____	_____X_____	
8. Initial Submittal of InRoads TMOSS and/or MOSS	_____	_____X_____	
9. Initial Submittal of an Original Plan Sheet	_____	_____	
B. Project Development:			
1. Public Communication Contact List	_____	_____X_____	
2. Route Location Survey:			
a. Electronic Survey Files	_____	_____X_____	
b. Survey InRoads TMOSS Data Openroads Designer	_____	_____X_____	
c. Monument Records	_____	_____X_____	
d. Control & Monumentation Plan Sheets	_____	_____X_____	
e. Aerial Photography Index Map Sheets	_____	_____	
f. Aerial Photography Contact Prints	_____	_____	
g. Aerial Photography Negatives	_____	_____	
h. Photogrammetry			
(1) Electronic Data	_____	_____	
(2) Base Map Sheets	_____	_____	
(3) Base Map Index Sheet(s)	_____	_____	
i. Rectified Photos with Mylar Originals	_____	_____	
3. System Feasibility Study	_____	_____	
4. Final Alternatives Report	_____	_____	
5. Noise Assessment Report	_____	_____X_____	
6. Air Quality Report	_____	_____X_____	
7. Archaeology Survey Report & Mitigation Plan	_____	_____X_____	
8. Paleontology Preliminary Report & Mitigation Plan	_____	_____X_____	
9. Water Quality Report (SCMP)	_____	_____X_____	
10. Ecology Report	_____	_____X_____	
11. Historical Bridge Clearance or Mitigation Plan	_____	_____X_____	
12. Historical Cultural Resources Report	_____	_____X_____	
13. Floodplain and Drainage Assessment Report & Mitigation Plan	_____	_____X_____	
14. ROW Report	_____	_____X_____	
15. 4(f)/6(f) Mitigation Plan	_____	_____X_____	
16. Threatened and/or Endangered Species	_____	_____	



SUBMITTALS	<u>CDOT/Other</u>	<u>Consultant</u>	Notes
Assessment		X	
17. Wetlands Findings Report		X	
18. Hazardous Materials Findings		X	
19. NEPA Documentation			
a. Preliminary Data Submission		X	
b. Draft & Final NEPA Documentation Preparation		X	
c. Finding of No Significant Impact (FONSI)		X	
20. Stakeholder Involvement Plan		X	
21. Design Report Process			
a. Preliminary Design Report		X	
b. Final Design Report		X	
22. Permits			
a. 401 Permit		X	
b. 402 Permit		X	
c. 404 Permit		X	
d. Wildlife Certification		X	
e. NPDES Storm Water Permit		X	
23. SEA Assessment Documentation			
a. Technology/SEA Assessment	X		
b. Alternative Analysis		X	
c. Concept of Operations		X	
d. System Functional Requirements		X	
e. High Level System Design		X	
f. Detailed Level System Design		X	
g. Testing and Integration		X	
h. Agreement with Partners		X	
i. Standard Operating Procedures (SOP)		X	
j. Maintenance Plan		X	
k. Validation Plan		X	
24. Preliminary Design			
a. Electronic Survey		X	
b. Traffic Data & Recommendations		X	
c. Soils Investigation Report		X	
d. Pavement Design Report		X	
e. Existing Bridge Condition Report		X	
f. Geotechnical Report		X	
g. Engineering Geology Plan Sheet(s)		X	
h. Preliminary Hydraulics Report		X	
i. Utility Relocation Recommendations		X	
j. Ditch Structure Plans		X	
k. Stabilization Plan		X	
l. FIR Plan Set		X	
25. Final Design			
a. Corrected FIR Plan Set		X	
b. Preliminary Cost Estimate		X	
c. List of Deviations from Standard Design			



SUBMITTALS	<u>CDOT/Other</u>	<u>Consultant</u>	<u>Notes</u>
Criteria		X	
d. Final Hydraulics Report		X	
e. Signing/Pavement Marking Plans		X	
f. Signal Warrants			
g. Signalized Intersection Plans and specifications			
h. Traffic Control Plan		X	
i. Structural Selection Report		X	
j. Geotechnical Investigation Report		X	
k. Structure Final Review Plans and Special Provisions		X	
l. Construction Phasing Plan		X	
m. FOR Plan Sheets and Special Provisions		X	
n. FOR Cost Estimate		X	
o. FOR Revised Plans and Special Provisions		X	
p. Final Review Revisions		X	
q. Final Utility Plan Set		X	
25. Roadside Planning			
a. SWMP Plans & Specs.		X	
b. Certification of Plant Availability		X	
c. Sprinkler System Plans & Specs.		X	
d. Bike path Plans & Specs.		X	
e. Chain Up Stations Plans & Specs.		X	
f. Rest Area Plans & Specs.		X	
g. Lighting Plans		X	
C. Right-of-Way			
1. Title Commitments		X	
2. Preliminary Ownership Map (include in the FIR plan set)		X	
3. Area Calculations		X	
4. Authorization Plans		X	
5. Legal Descriptions		X	
6. ROW Authorization Plans		X	
D. Construction Plan Package			
1. Roadway Design Data Submittal (Form 463)		X	
2. Major Structure Design Final Submittal		X	
3. Record Plan Sets		X	



APPENDIX A: REFERENCES

A.1. AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO) PUBLICATIONS (using latest approved versions):

- A Policy on Design Standards-Interstate System
- A Policy on Geometric Design of Highways and Streets
- Guide for Design of Pavement Structures
- Standard Specifications for Highway Bridges
- Guide for the Design of High Occupancy Vehicle and Public Transfer Facilities
- Guide for the Development of Bicycle Facilities
- Standard Specifications for Transportation Materials and Methods of Sampling and Testing – Part I, Specifications and Part II, Tests
- Highway Design and Operational Practices Related to Highway Safety
- Roadside Design Guide
- Load Resistance Factor Design (LRFD) Specifications

A.2. COLORADO DEPARTMENT OF TRANSPORTATION PUBLICATIONS (using latest approved versions):

- Design Guide (all volumes)
- Bridge Design Guide
- Bridge Detailing Manual
- Bridge Rating Manual
- Project Development Manual
- Erosion Control and Stormwater Quality Guide
- Field Log of Structures
- Cost Data Book
- Drainage Design Manual
- NEPA Manual
- Environmental Stewardship Guide
- Quality Manual
- Survey Manual
- Field Materials Manual
- Standard Plans, M & S Standards
- Standard Specifications for Road and Bridge Construction and Supplemental Specifications
- Item Description and Abbreviations (with code number) compiled by Engineering Estimates and Market Analysis Unit (“Item Book”)
- Right-of-Way Manual
- The State Highway Access Code
- Utility Manual
- TMOSS Generic Format
- Field TMOSS Topography Coding
- Topography Modeling Survey System User Manual
- Interactive Graphics System Symbol Table
- I-70 Mountain Corridor Design Criteria and Aesthetics Guidance



A.3. CDOT PROCEDURAL DIRECTIVES (using latest approved versions):

- The Consultant shall adhere to all applicable CDOT Procedural Directives.

A.4. FEDERAL PUBLICATIONS (using latest approved versions):

- Manual on Uniform Traffic Control Devices
- Highway Capacity Manual
- Urban Transportation Operations Training – Design of Urban Streets, Student Workbook
- Reference Guide Outline – Specifications for Aerial Surveys and Mapping by Photogrammetric Methods for Highways
- Executive Order 12898
- Executive Order 11988 & 13690 FHWA Federal-Aid Policy Guide
- FHWA NHI Hydraulic Circular (HEC) and Hydraulic Design Series (HDS) Reports
- Technical Advisory T6640.8A
- U.S. Department of Transportation Order 5610.1E
- Geometric Geodetic Accuracy Standards and Specifications for Using GPS Relative Positioning Techniques
- ADAAG Americans with Disabilities Act Accessibility Guidelines
- 23 CFR 771, the FHWA Technical Advisory T6640.8A
- 44 CFR 59-72, standards of the National Flood Insurance Program (NFIP)
- ASCE 38-02 or current standard
- Utility Accommodation Code 2 CCR 601-18

A.5. AREA (using latest approved versions):

- County of Clear Creek Roadway Design and Construction Manual



APPENDIX B: DEFINITIONS

Note: For other definitions and terms, refer to Section 101 of the CDOT Standard Specifications for Road and Bridge Construction and the CDOT Design Guide.

AASHTO	American Association of State Highway & Transportation Officials
ADT	Average two-way 24-hour Traffic in Number of Vehicles
AREA	American Railway Engineering Association
ATSSA	American Traffic Safety Services Association
AT&SF	Atchison, Topeka & Santa Fe Railway Company
ADAAG	Americans with Disabilities Accessibility Act Guidelines
BAMS	Bid Analysis and Management Systems
BFE	Base Flood Elevation
BLM	Bureau of Land Management
BNRR	Burlington Northern Railroad
CA	Contract Administrator – The CDOT Manager responsible for the satisfactory completion of the contract by the Consultant.
CAP	CDOT’s Action Plan
CBC	Concrete Box Culvert
CDOT	Colorado Department of Transportation
CDOT/PM	Colorado Department of Transportation Project Manager – The CDOT Engineer responsible for the day-to-day direction and CDOT Consultant coordination of the design effort (as defined in Section 2 of this document)
CDOT/STR	Colorado Department of Transportation Structure Reviewer – The CDOT Engineer responsible for reviewing and coordinating major structural design
CDPHE	Colorado Department of Public Health and Environment
CEQ	Council on Environmental Quality
CISP	Colorado Information Security Policy
CMGC	Construction Manager / General Contractor Project Delivery Method
COG	Council of Governments
COGO	Coordinate Geometry Output
CONSULTANT	Consultant for the Project
CONTRACT ADMINISTRATOR	Typically a Region Engineer or Branch Head. The CDOT employee directly responsible for the satisfactory completion of the contract by the Consultant. The contract administration is usually delegated to a CDOT Project Manager (as defined in Section 2 of this document).
C/PM	Consultant Project Manager – The Consultant Engineer responsible for combining the various inputs in the process of completing the project plans and managing the Consultant design effort.
CWCB	Colorado Water Conservation Board
CY	Calendar Year
DEIS	Draft Environmental Impact Statement
DHV	Future Design Hourly Volume (two-way unless specified otherwise)
DOR	Design Office Review
DRCOG	Denver Regional Council of Governments
DSB	Disadvantaged Business Enterprise
D&RGW	Denver & Rio Grande Western Railroad
EA	Environmental Assessment
EIS	Environmental Impact Statement
ESAL	Equivalent Single Axle Load
ESB	Emerging Small Business Enterprise



ESE	Economic, Social and Environmental
FEIS	Final Environmental Impact Statement
FEMA	Federal Emergency Management Agency
FHPG	Federal Aid Highway Policy Guide
FHWA	Federal Highway Administration
FIPI	Finding In Public Interest
FIR	Field Inspection Review
FONSI	Finding of No Significant Impact
FOR	Final Office Review
GPS	Global Positioning System
MAJOR STRUCTURES	Bridges and culverts with a total clear span length greater than twenty feet. This length is measured along the centerline of roadway for bridges and culverts, from abutment face to abutment face, retaining structures are measured along the horizontal distance along the top of the wall. Structures with exposed heights at any section over five feet and total lengths greater than a hundred feet as well as overhead structures including (bridge signs, cantilevers and butterflies extending over traffic) are also considered major structures.
MPO	Metropolitan Planning Organization (i.e. Denver Regional Council of Governments, Pikes Peak Area Council of Governments, Grand Junction MPO, Pueblo MPO, and North Front Range Council of Governments).
MS4	Municipal Separate Storm Sewer System
NEPA	National Environmental Policy Act
NFIP	National Flood Insurance Program
NGS	National Geodetic Survey
NICET	National Institute for Certification in Technology
NOAA	National Oceanic and Atmospheric Administration
OIT	Office of Information Technology
PAPER SIZES	See Computer-Aided Drafting Manual (CDOT); Table 6-13 and Table 8-1
PE	Professional Engineer registered in Colorado
PM	Project Manager
PLS	Professional Land Surveyor registered in Colorado
PRT	Project Review Team
PS&E	Plans, Specifications and Estimate
PROJECT	The work defined by this scope
PWQ CM	Permanent Water Quality Control Measure
ROR	Region Office Review
ROW	Right-of-Way: A general term denoting land, property, or interest therein, usually in a strip acquired for or devoted to a highway
ROWPR	Right-of-Way Plan Review
RTD	Regional Transportation Director
T/E	Threatened and/or Endangered Species
SEA	System Engineering Analysis
SFHA	Special Flood Hazard Area
SUE	Subsurface Utility Engineering
SH	State Highway Numbers
TMOSS	Terrain Modeling Survey System
TOPOGRAPHY	In the context of CDOT plans, topography normally refers to existing cultural or manmade details.
UDFCD	Urban Drainage and Flood Control District
USCOE	United States Army Corp of Engineers