

Draft Request for Proposals (RFP)

DRAFT Design – Professional Services Scope of Work

**I-70 Floyd Hill to Veterans Memorial Tunnels
Mile Point (MP) 241 to MP 249**



PROJECT NUMBERS: NHPP 0703-446/FBR 0703-457

PROJECT LOCATION: I-70 near Idaho Springs, CO

PROJECT CODE: 21912/22716

October 7, 2021

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 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 (NTP), 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. The Final Scope of Work submitted will be generated by CDOT personnel and be on CDOT letterhead.



SECTION 1 – PROJECT SPECIFIC INFORMATION

1.1. PROJECT BACKGROUND

I-70 Mountain Corridor Overview

The I-70 Mountain Corridor is a critical lifeline for Colorado, connecting Colorado’s Front Range with the mountain communities, recreational areas, and resorts that are all primary economic drivers for the state. I-70 is critical for the movement of freight from both the east and the west, linking economies from coast-to-coast and providing the only continuous route that brings goods and materials to Colorado’s mountain and Western Slope communities.

I-70 PEIS and ROD: 2011

The Floyd Hill Project improvements are 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>.

Concept Development Process: 2016-2017

From August 2016 to July 2017, CDOT conducted a Concept Development Process, which focused on developing conceptual recommendations to implement the PEIS Preferred Alternative on westbound I-70 from the top of Floyd Hill (MP 248) to the interchange of I-70 with US 40 (called Empire Junction) (MP 232). The Concept Development Process documents are available at:

<https://www.codot.gov/projects/i70mountaincorridor/concept-development-process>.

Tier 2 NEPA Process

The Tier 2 NEPA process for the Floyd Hill Project is currently in process. The Environmental Assessment (EA) was signed in July 2021 and released on August 2, 2021, for a 60-day public review period, with a decision document anticipated in 2022. The EA materials are available at:

<https://www.codot.gov/projects/i70floydhill>.

1.2. PROJECT LIMITS

The Project is located on I-70 between MP 249 (east of the Beaver Brook/Floyd Hill interchange) and MP 241 (Idaho Springs/Colorado Boulevard, west of the Veterans Memorial Tunnels). It is located mostly in Clear Creek County, with the eastern end in Jefferson County. The primary roadway construction activities would occur between County Road (CR) 65 (the Beaver Brook/Floyd Hill interchange, Exit 248) and the western portals of the Veterans Memorial Tunnels (milepost 247.6 and milepost 242.3, respectively), with the Project area extended east and west to account for signing, striping, and fencing.

1.3. PROJECT GOALS

The CDOT Project Goals reflect the values that this Project holds and expects. An exceptional proposal will demonstrate how each of the Project Goals will be pursued by the Proposer. The natural environment is an extremely important element that needs to be considered during the Project’s design development and construction.

The following Project Goals were developed for this RFP based upon the foundation of the Project Leadership Team Draft Project Goals listed in **Appendix C** of this SOW, which were completed by the Project Leadership Team (CDOT, FHWA, local governments, stakeholders) as part of the CSS process.



A. Improve Safety, Mobility, Operations and Maintenance

Improve the safety, mobility, operations, and maintenance characteristics throughout the Project. This will include replacing aging infrastructure, reconfiguring non-standard interchanges, updating to current design standards, increasing travel time reliability, achieving a minimum 55 miles per hour (“mph”) design speed, reducing emergency response times, and providing redundant access for local residents.

Utilizing state of the practice techniques, maximize the safety of workers, the traveling public, residents, and business owners during construction. Optimize the maintenance operations of the facility throughout the design life. Maintenance operations during construction will meet the established Maintenance Level of Service for the I-70 Mountain Corridor.

B. Foster Stakeholder Commitment and Partnership

Foster collaboration, communication, and partnerships among stakeholders throughout the I-70 Mountain Corridor. Implement the design guidance and CSS commitments through the Project development process. Leverage partnerships with stakeholders to maximize opportunity for shared use facilities along I-70 and the frontage road. CDOT, the CM, and the Design Team will collaborate with stakeholders in a timely manner to finalize the NEPA process. This collaboration will utilize the CSS process to encourage the incorporation of innovation throughout the Project. Additional information regarding the CSS process can be found within the EA materials at the EA web link provided in **Section 1.1** of this SOW.

C. Enhance Environmental Stewardship

Avoid and minimize impacts to environmental resources identified in the NEPA process and ensure that these commitments are carried forward into construction. Implement innovative methods for environmental stewardship and community supported enhancements that maximize opportunity for shared-use within and adjacent to the I-70 Mountain Corridor. Incorporate early wildlife mitigation considerations that improve safety for both the travelling public and wildlife.

D. Minimize Construction and Economic Impacts Through Innovation

Minimize inconvenience and impacts to the traveling public, residents, and business owners during construction. Accommodate and maintain freight and interstate travel. Provide access to recreation and jobs along the I-70 Mountain Corridor. Create a reliable communication system for disseminating information using accurate, meaningful, and timely communication technologies and resources.

E. Optimize Scope, Schedule, and Budget

Balance schedule and budget to maximize the scope and positive impact of the Project. Utilize innovation and manage risk to recover budget to reinvest in the Project.

1.4. PROJECT FUNDING

The funding for the full Project has not been fully identified at this time which requires CDOT to take a holistic approach to identify proactive measures to deliver as much of the Project Scope Elements with available funding, while maintaining synchronicity with future funding allotments. To achieve this goal, CDOT has continued to refine the scope and has developed strategies to maximize the available funding as soon as possible.



CDOT anticipates the final funding source determinations and the associated Project budget will be finalized by September 1, 2022.

CDOT is pursuing full funding for the Project, which could include alternate financing, toll revenues, federal grants, or a combination of all of these. The current identified Project funding sources include but are not limited to: Senate Bill 267, Bridge Enterprise, and High Performance Transportation Enterprise.

The High Performance Transportation Enterprise, an independent business enterprise within CDOT charged with pursuing innovative financing alternatives to deliver important surface transportation infrastructure projects in the state, is currently conducting a funding gap study to determine if alternative or creative funding or financing options, including tolling options, could be leveraged to supplement the CDOT sources.

1.5. PROJECT INFORMATION AND DEFINITION

The goal of the Project is to construct the below Project Scope Elements in their entirety to minimize impacts to stakeholders and the traveling public. All Project Scope Elements are included in this solicitation for services but are not guaranteed if funding is not identified or costs exceed the project budget or available funding resources. The Project Scope Elements may be modified based on available funding, packaging, CM input, Stakeholder input, and final design refinements. If it is determined to be in the interest of the Department, or to meet funding constraints, portions of the completed design may be procured separately. If, through the Tier 2 NEPA Process, a build alternative is not selected, CDOT reserves the right to terminate the contract.

Project Scope Elements

- I-70 Mainline Scope:
 - Roadway geometry improvements to WB & EB I-70 between Exit 241 at Idaho Springs and Exit 248 at Floyd Hill,
 - Continue WB third lane from the Hyland Hills/Floyd Hill Interchange (Exit 247), where it currently drops from three lanes to two lanes, through the Veterans Memorial Tunnels,
 - Addition of EB auxiliary lane from the bottom of Floyd Hill at the US 6 Interchange (Exit 244) to the Hyland Hills/Floyd Hill Interchange (Exit 247),
 - Replace EB/WB I-70 Mainline over US 6 and Clear Creek,
 - Intelligent Transportation System (ITS) improvements throughout the Project limits,
 - Addition of Tolling Infrastructure for the managed lane,
 - Storm sewer infrastructure and other utility improvements along impacted roadway,
 - Connect the Project to the Mountain Express Lanes, and
 - Restriping and static signing throughout the Project limits.
- Intersection and Interchange Improvements:
 - Replace US 6 to WB I-70 on ramp,
 - Replace Bridge Enterprise-eligible bridge - WB I-70 to US 6 off-ramp,
 - Add US 6 to EB I-70 on ramp, and
 - Roundabouts and intersection improvements at the Hidden Valley/Central City Interchange (Exit 243).



- Other
 - Realign approximately 1,200 linear feet of Clear Creek to the south by approximately 50 feet just east of the Veterans Memorial Tunnels,
 - Realign County Road 314 between the Veterans Memorial Tunnels and Hidden Valley Interchange,
 - Improve and update the Clear Creek Greenway between US 6 and the Veterans Memorial Tunnels to current ADA standards as approved by CDOT,
 - Connect frontage road between US 6 Interchange (Exit 244) and the Hidden Valley/Central City Interchange (Exit 243) (replaces EB I-70 off-ramp to US-6),
 - Rock Excavation,
 - Construct water quality features associated with improvements, and
 - Wildlife improvements, including fencing and benches under bridges.

1.6. PROJECT ROLES

Lead and Supporting Agencies: CDOT is the lead agency and Owner of the Project. Oversight is provided by FHWA.

Stakeholders: Primary Project stakeholders and their role or involvement in the Project are listed in the following table:



Stakeholders

Agency/Stakeholder	Role or Involvement
Federal Highway Administration (“FHWA”)	<ul style="list-style-type: none"> ● Project oversight ● Member of the Project Leadership Team and Technical Team
United States Forest Service (“USFS”)	<ul style="list-style-type: none"> ● Member of the Project Leadership Team and Technical Team
Clear Creek County	<ul style="list-style-type: none"> ● Project limits primarily within Clear Creek County ● Member of the Project Leadership Team and Technical Team
Jefferson County	<ul style="list-style-type: none"> ● Small area of Project limits within Jefferson County ● Member of the Project Technical Team
City of Idaho Springs	<ul style="list-style-type: none"> ● Small area of Project limits within City limits ● Member of the Project Leadership Team and Technical Team
I-70 Coalition	<ul style="list-style-type: none"> ● Member of the Project Leadership Team and Technical Team
Colorado Parks and Wildlife (“CPW”)	<ul style="list-style-type: none"> ● Member of the ALIVE ITF ● Coordinating partners of the design and construction of wildlife mitigation ● Coordinate wildlife habitat consideration and connectivity during preconstruction ● Member of the Project’s Technical Team
US Fish and Wildlife Service (“USFWS”)	<ul style="list-style-type: none"> ● Member of the SWEEP ITF ● Interest in preservation and enhancement of fish habitat in Clear Creek and other secondary waterways ● Regulation of federally listed species in the project limits
Army Corps of Engineers (“ACOE”)	<ul style="list-style-type: none"> ● 404 Permit decisions
Colorado Motor Carriers Association	<ul style="list-style-type: none"> ● Input on freight consideration, decisions, and impacts for the Project ● Member of the Project Technical Team



Additional Coordination Contacts

Other Stakeholders	Role or Involvement
Private Property Owners and/or Residents	<ul style="list-style-type: none"> ● Roadway reconstruction input ● Will want to know travel impacts/delays/detours
Traveling public	<ul style="list-style-type: none"> ● Roadway safety/trip reliability input ● Will want to know travel impacts/delay/detours
Recreational users	<ul style="list-style-type: none"> ● Fishing/River access input ● Recreation Path input ● Trail input ● Commercial and private rafting industry ● Skiing industry
Emergency Responders/Incident Command	<ul style="list-style-type: none"> ● Emergency response/access input ● Will want to know travel impacts/delay/detours ● Members of local emergency responders are on the Project’s Technical Team ● Incident Management and Planning for all potential impacts ● CDOT Executive Leadership ● CDOT Traffic Operations Center (CDOT TOC)

Anticipated Utility Coordination/Relocations

Utility Identification	Facility type	Relocation Required?
Cable Television (Comcast)	Comcast provides cable television service to the corridor communities. There is one buried fiber conduit and several cables throughout the project area	TBD
Electric (Xcel Energy)	Xcel Energy has two main feeder lines and numerous smaller distribution lines in the western part of the study area	TBD
Telecommunications (CDOT and Zayo)	CDOT and Zayo have buried fiber optic and copper cable lines throughout the study area, including a continuous fiber optic conduit which runs along I-70 the entire length of the study area and services CDOT’s variable message signs along I-70	Yes
Gas (Xcel)	Low and High Pressure lines are potentially within the project area	TBD
Sanitary Sewers (ERWSD)	Location and potential conflicts to be further investigated	Not anticipated
Water	Location and potential conflicts to be further investigated	Not anticipated
Storm Sewer (CDOT)	CDOT has a storm sewer collection system within the corridor	Yes



1.7. WORK DURATION

The time period for this work described in this scope is estimated to begin March 1, 2022 and end December 1, 2027. It is estimated that the project can be constructed in five years from commencement. It is CDOT's goal to start construction on this project in Calendar Year 2023 as defined in the goals. The Consultant should expect to have design and construction overlap should the team proceed with concurrent packages.

1.8. COLLABORATION

This project will be delivered via Construction Management/General Contractor (CM/GC) procurement. The Consultant will need to work in conjunction with the Construction Manager (CM) to collaborate on innovation and constructability throughout the duration of the project, as well as follow the CM/GC process.

1.9. 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 work closely with CDOT's Project Manager, ICE, Construction Manager, and consultant construction management personnel. The Consultant shall supply Engineer signed and sealed electronic plans and reports. The Consultant shall collaborate with the NEPA effort and include the mitigation measures identified in the EA into the plans and specifications for the Floyd Hill Project.

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 for Construction Agreed Price ("CAP") negotiations of the planned improvements. Additionally, the Consultant is required to develop concepts and associated quantities to allow the Independent Cost Estimator (ICE) to create cost estimates to assist with CDOT decision making. The work will include, but is not limited to, the design of the roadway and interchange improvements, structural and retaining wall design, environmental, traffic, hydraulics, geohazards/geotechnical, rock cut, survey, utility, and water quality design.

The Project will be delivered via a Construction Management/General Contractor (CM/GC) procurement. The Consultant must work in conjunction with the CM/GC to collaborate on innovation, constructability, schedule, and risk throughout the duration of the project in addition to following the CM/GC process. The Consultant is also required to collaborate with the ongoing EA process, stakeholders, and ITF groups by providing design updates and necessary design files as needed to support the EA process and work toward a decision document.

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
- Attend project meetings
- Meet all project milestones
- Create and maintain project CPM schedules for design and construction
- Develop concepts and quantities for cost estimates



- Participate in public outreach meetings
- Provide environmental support to complete the Project and complete NEPA reevaluations as needed after the NEPA decision document has been completed.
- Provide Subsurface Utility Engineering (SUE) research, field investigation, utility coordination, and sealed plans.
- Attend site meetings and site visits, documenting critical dimensions.
- Provide FIR, DOR, FOR, and final project design, specifications, and quantities for estimates
- Provide phasing and detour concepts that will meet project goals
- Track project action items and deliverables

1.10. 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
- Key Personnel in the Statement of Interest section of the Proposal, see **Section 6** of the Design RFP, constitutes an agreement by the Proposer to make the Key Personnel available to complete the services of the contract at the level the Project requires. CDOT requires that all Key Personnel be engaged to perform their specialty for all services required by this contract, and the Key



Personnel shall be retained for the life of this contract to the extent practicable and to the extent that such services maximize the quality of work hereunder.

If the Consultant or a subconsultant decides to replace any of its Key Personnel, the Consultant shall notify the Project Director in writing of the desired change. No such changes shall be made until at least two qualified replacement candidates are recommended by the Consultant and a replacement is approved in writing by the Project Director or its designated representative. The approval shall not be unreasonably withheld. Failure of the Consultant to comply with the requirements of this provision may be the cause for CDOT's termination of the contract.

The Project Director or its designated representative will respond to the Consultant's written notice regarding replacement of Key Personnel within fifteen working days after receipt of the list of proposed changes. If the Project Director or its designated representative does not respond within that time, the listed changes shall be deemed to be approved.

If, during the term of the contract, the Project Director or its designated representative determines that the performance of approved Key Personnel is not acceptable, a notification shall be sent to the Consultant. The notification shall include a reasonable timeframe to correct such performance. Thereafter the Consultant may be required to reassign or replace such Key Personnel. If the Project Director or its designated representative notifies the Consultant that certain Key Personnel of a subconsultant should be replaced, the Consultant shall use its best efforts to replace such Key Personnel within a reasonable time, but not to exceed fifteen working days from the date of the notice.

1.11. 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 - CDOT Staff Bridge software shall be used in either design or design check, refer to the CDOT Bridge Design Manual
- Estimating - Transport (an AASHTO sponsored software) as used by CDOT
- ArcView for Water Quality data
- LIMS
- 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

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.



1.12. PROJECT COORDINATION AND MEETINGS

The Consultant will be required to provide primary coordination with the CDOT PM and specialty units as approved. There is an extensive list of stakeholders for this project for each PLT, TT and ITF as well as local agencies that are interested in the project. This list is included in **Section 1.6 Project Roles** in this SOW.

The Kick-Off Workshop will emphasize the importance of partnering within the CM/GC delivery method by focusing on team building and partnering over a 2-day period. This workshop is mandatory for all key team members including key subcontractors. This workshop will be facilitated by CDOT and will cover at a minimum the following items:

- Introduction to the Project, CM/GC, partnering, Project stakeholder engagement, roles and responsibilities identification. Subcontractors performing major and high-risk work items should be in attendance.
- The Team will review Project status, vision, goals, objectives, funding, preliminary pre-construction schedule, what success would look like, current design, etc.
- Initial discussion of innovations, phasing, and risk mitigations being proposed by the CM, Design Consultant, and ICE.
- Cost Model review and coordination with the ICE during OPCCs.
- Cost Model components.
- Project Schedule meetings in accordance with the schedule developed by the CM.
- Agreement on progress meeting frequencies and initiate working groups for various elements of the Project. Progress meetings may include project management meetings, design meetings, discipline/specialty meetings, stakeholder meetings, and public meetings.
- Strategy, timing, and approach for the Project Innovation and Value Engineering Workshop.

The Project Innovation and Value Engineering Workshop will be co-facilitated by CDOT, the CM, ICE, and the Design Consultant. Attendance and duration will be determined at the Kick-Off Meeting. It is also anticipated that Project stakeholders' input will also be incorporated into this workshop. The approach, agenda, format, and duration for the workshop will be developed in collaboration with CDOT, the CM, ICE, and the Design Consultant. The CM shall provide input into how to achieve the desired results for the Project. This workshop could require several sessions, over an extended period. The purpose of this workshop is to evaluate the Preferred Alternative, consider any CM innovations or design refinements for the Project, incorporate value engineering principles to the Project, incorporate stakeholder input and get support for endorsement of any potential changes to the Preferred Alternative.

The Consultant shall be prepared to participate in Project Vision Meetings to analyze how Project progress is aligning and tracking with Project Goals. Items of focus include priorities, commitments, approach, scope, schedule, and cost reasonableness. The Project Vision Meetings are anticipated to be scheduled quarterly at a minimum to achieve the Project Goals and will be conducted by the CM.

1.13. 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. 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.



1.14. WORK PRODUCT

The following work products include all 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 / Final SUE Work
- Schedules
- Meeting Minutes
- CSS Stakeholder Coordination and Public Outreach
- Survey
- Wetlands / 404
- Geotechnical Investigation
- Structural Engineering
- Highway Design and Traffic/Safety Engineering
- Hydraulics and Hydrology
- Environmental Compliance and EA Reevaluation
- 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/CAP 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.

1.15. ADDITIONAL PROJECT INFORMATION

Additional information regarding this project is included downloadable documentation found under the Project Delivery tab at the following link: <https://www.codot.gov/projects/i70floydhill>



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:
Kurt Kionka, PE
I-70 Floyd Hill to Veterans Memorial Tunnels Project
425A Corporate Circle
Golden, CO 80401
C: 720-390-8701
kurt.kionka@state.co.us
- B. Active day-to-day administration of the contract will be delegated to the CDOT/PM:
Tyler Brady, PE
I-70 Floyd Hill to Veterans Memorial Tunnels Project
425A Corporate Circle
Golden, CO 80401
W: 720-497-6902
tyler.brady@state.co.us

2.2. PROJECT MANAGEMENT

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

- The consultant shall provide the Key Personnel as identified in the Design RFP for the overall interdisciplinary needs of the Project.
- Attend CDOT PM check-in meetings with all Consultant PM and Task Leads present as needed
- Provide monthly progress reports and invoicing, track progress of deliverables against the developed schedule, and ensure internal project controls are being followed. If the project falls behind schedule, provide a plan to get back on track.
- Assist with maintaining the CDOT Project webpage with appropriate updates.
- Provide Project Management efforts in following areas at a minimum:
 - Risk Management – develop and execute a plan for risk management which will include the following:
 - The plan for how to identify, track, analyze and respond to project risks
 - Track risks and provide recommendations to either avoid, transfer, mitigate or accept individual risks to the project scope, schedule, and budget
 - Roles and responsibilities
 - Maintain the contact list for the project and all stakeholders
 - Document decision making hierarchy for the project
 - 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.
 - Contract Management – develop and execute a plan for contract management including working with the CDOT PM to develop the task orders.
 - 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.
 - Task orders will be written to define the task order scope. Notify the CDOT PM about potential out of scope items.



- Cost Management – develop the quantities required for the construction cost estimate at major project milestones. Since this project will be delivered via CM/GC, this project will have an independent cost estimator to complete the actual construction estimate.
- Schedule Management – develop and execute a schedule management plan including:
 - The plan to develop, maintain and communicate the project schedule for the time and resources on the project.
 - The schedule shall be a detailed schedule using one of the programs allowed in **Section 1.11** in this SOW tracking all major milestones, CSS process, deliverables for the design process, and tie to CM/GC deliverables. 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.
- Change Management – develop and execute a change management plan that will include the following:
 - Define how project deliverables and documentation will be controlled, changed, and approved. Note how changes could impact the project scope, schedule, and budget.
 - Identify who should approve the changes and how they will be communicated and documented.
- Communication Management – assist in developing a communication management plan for the design development process. It should be noted that communication management needs for the completion of the NEPA process and decision document will be the responsibility of the current consultant team. CDOT envisions that consultant support for Communication Management during the design development and construction phase(s) of the Project will be contracted through a separate contract. The Consultant shall support CDOT as needed, and the plan shall include the following:
 - The processes that are required to ensure timely and appropriate planning, collection, creation, distribution, management, control and monitoring of project information.
 - Ensure that project information is consistently distributed in a timely manner to the team members that need it in the appropriate format.
 - Meeting planning
 - Participate in establishing the frequency of meetings and the most effective team members to invite and attend
 - For major meetings establish a meeting plan template defining who, what, where, when, why, how, etc.
 - For all stakeholder meetings, including public, PLT, TT, ITF, small group stakeholder and others the following shall apply:
 - A Consultant liaison shall be available to participate as needed.
 - Specific Coordination Meetings will require Consultant participation for major stakeholder meetings like PLT, TT, ITF and Public meetings.
 - Track crucial project decisions in a communications log
 - Provide communication as appropriate with internal CDOT Specialty units as directed by the CDOT PM
 - Contact and coordinate project needs with CDOT personnel and additional entities noted in **Section 1.6** of this SOW.
 - Document and report to CDOT PM when items have been submitted for review and log and track responses.



- 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 back on each discipline/action that is progressing.
- Quality Management – Develop and execute a quality management plan for all project deliverables. The plan shall include quality assurance and quality control:
 - Ensure accuracy and elimination of errors reducing the need for rework
 - 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
 - Provide contract documents that take into consideration constructability and maintainability
 - 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.
- Action Items and Deliverables tracking: Track action items and note date assigned, date completed, item, and who is responsible. Provide management of consultant team tasks and team members, including sub consultants and vendors, and work or task leads. Report progress to CDOT PM. 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.
- Routine Reporting and Billing
 - Coordinate all activities with the CDOT PM
 - See requirements for monthly billing in **Section 4** General Information in this SOW.
 - 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.
 - Provide Vendor backup as part of all executed Task Orders

2.3. PRELIMINARY ENGINEERING / CONSTRUCTION PLANS

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 field work as required to complete this SOW. Consultant shall supply a vendor for traffic control services. Submit an MHT to CDOT PM for review. Coordinate field work 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:

- Project Scoping: Host a formal project scoping meeting to address the following items:
 - This Project requires the early identification of all required variables at the initial scoping meeting. The Consultant shall be familiar with all the mitigation requirements of the EA, the scope of improvements and the CSS process.
 - Establish and layout the plan to deliver the project to construction
 - Prepare a plan for preliminary quantities
 - Prepare preliminary plan and profile of improvements
 - Applicable traffic data and traffic review of scope items
 - Environmental considerations
 - Establish and confirm the design requirements for the following items:



- Typical sections
- Horizontal and vertical alignment
- Detour alignment
- Drainage and hydraulics
- Approach of project
- Aesthetic features
- Pedestrian and bicycle facilities
- Landscaping
- Lighting
- Major structures
- Minor structures
- Walls
- Pedestrians/recreation
- Signs/miscellaneous
- Safety
- ITS components
- Traffic control
- Access control
- Source of materials
- Roadway and roadside clearances
- Erosion control
- Pavement options
- Wetland / 404 Permit
- Review construction requirements
- NEPA Commitments
- Maintenance concerns
- ROW
- Survey
- Traffic and safety issues
- Utility
- Contract
- Geotechnical and Geohazards
- Coordination of all disciplines
- ITS components
- Other
- Reference 23 CFR Part 625, Design Standards for Highways
- Field Inspection Review (FIR): Host a formal FIR Meeting:
 - 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.
 - Provide a detailed preliminary cost estimate.
- Design Office Review (DOR): Host a formal DOR Meeting:
 - The DOR package shall incorporate all the ongoing TT/ITF efforts.
 - This shall be a 60% design development issue package that provides plan sheets and details for all of the planned improvements items and also includes:
 - Title Sheet
 - Standard Plans List
 - Typical Sections
 - General Notes
 - Summary of Approximate Quantities



- Tabulation Sheets
- Plan and Profiles
- Wall layouts
- Structure layouts
- Storm water plans
- ITS concepts and coordination
- Preliminary construction Phasing
- Traffic Control
- SWMP
- Custom Detail Concepts as required for construction
 - Identify required Project Specifications
 - Provide a preliminary detailed cost estimate with summary of approximate quantities
- FOR: Host a formal Final Office Review of the plans, specifications, and cost estimate
 - Address all comments from the DOR plan set
 - Update all plans and specs to a 90% design development issue level.
 - Submit all required reports
 - All TT/ITF efforts shall be completed

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

This project is a CM/GC project, the Consultant need only provide quantities for the cost estimates. Cost estimating will be performed by an independent cost estimator. However, the Consultant should plan on the preparation of cost estimates as noted above for FIR, DOR, and FOR.

When applicable, the engineering and overall process must consider ALL of the proposed Project Scope Elements as part of the EA 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:

- Final PSE: Provide a final Plans, Specs and Estimate for review prior to final AD/CAP set. 99% Design Development Plans
- Final AD/CAP set of plans. 100% construction documents

2.4. SURVEY COORDINATION

The goal of the survey effort is to tie the existing aerial mapping to CDOT control and verify accuracy and supplement areas of missing information. Additional detail may be needed or desired around structures or other improvement locations. Provide complete ROW Plan development services for any private property acquisition or U.S. Forest Service Highway Easement Deed (HED) needs. Prepare legal descriptions for any private property acquisitions. It is the intent of this SOW to 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.



- The State has aerial mapping of the project limits and does not anticipate that a survey of the entire project limits is required. The Consultant shall review the existing information and determine areas that need additional detail.
- Verify existing CDOT Control. Additional control may need to be added to the existing CDOT Control.
- 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.
- 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. It is expected that the Consultant will adhere to SUE requirements in Section 2.11 of this SOW.
- The consultant shall complete CDOT PM Form 1217 to determine the precise survey limits.
- Attend Pre-Survey Conference.
- Prepare and obtain “Permission to Enter Property” forms for the purpose of surveying within private ownership parcels. If surveying on USFS property, obtain the necessary approvals from the USFS.
- 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, Method of Handling Traffic (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.
- 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.
- Prepare TMOSS Topographic survey of designated areas
 - Wetlands will be marked by Environmental Consultant and coordinated with the survey crew in the field on site. Flagged wetlands shall be surveyed.
 - Designate and locate the Ordinary (visible) High Water Mark of Clear Creek
 - Provide utility locates for design purposes and survey located underground and above ground utilities. Provide coordination with local utility companies. Provide inverts of manholes as is best reasonably possible. (See also Section 2.11 of this SOW)
 - Provide potholing for establishment of utility profiles and survey locations and depths to utilities.
 - 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.
 - Coordinate with CDOT Hydraulic Engineer if cross sections or flow lines of the river are required for Clear Creek.
 - Determine Existing Right of Way and HED limits. Provide a DGN file of the existing Right of Way Model.
 - Locate Geotechnical Borings.
- Obtain Title Commitments for any private properties from which ROW or easements may be required.
- Provide Survey Report



- Prepare right-of-way plans in CDOT format for impacted private properties and USFS property based on title commitments. 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.
- Stake the proposed parcels and easements for appraisal purposes. A one-time staking effort may be assumed.
- 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 or Jefferson County Clerk and Recorder's office as appropriate.
- All Survey deliverables shall be submitted in MicroStation Open Roads (ORD) format.

2.5. GEOTECHNICAL INVESTIGATION

- Incorporate geotechnical mitigation requirements from the EA into project design and recommendations.
- 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.
- 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 instead of wall construction, such as exposed roadside cut areas.
- The consultant shall follow the guidelines set forth in the latest CDOT Geotechnical Design Manual for the preparation of the Geotechnical Investigation Report. Including, but not limited to:
 - Standards for CDOT Geotechnical Work Table 2-1
 - Accepted Geotechnical Software for CDOT Projects Table 2-2
 - A full literature review
 - Field Reconnaissance
 - Minimum Requirements for Subsurface Explorations Table 3-2 for:
 - Pavement Design
 - Foundations
 - Retaining Walls
 - Culverts
 - Landslide Evaluation
 - Cut Slopes
 - Embankments
 - Follow the prescribed methods for subsurface exploration.
- Refer to the latest CDOT Bridge Design Manual for other requirements and requirements for geology sheets.
- 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.
- 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.

- 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 to determine classifications, moisture, density, resistance values, pH, sulfides, and strength parameters.
- Review geotechnical hazard maps provided as part of the EA and provide appropriate recommendations as needed in collaboration with the CDOT Geohazards Program.
- 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, mitigation to reduce the risks of disturbance to the sensitive area shall be recommended.
- Identification of geotechnical issues and concerns associated with locations.
- Provide a draft report for CDOT specialty unit and PM review prior to issuing the final stamped version. Final engineer stamped versions are required.
- 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.
- This project will need a Life Cycle Cost Analysis for the pavement section. Most likely, CDOT materials will perform the calculation.

2.6. STRUCTURAL ENGINEERING

- The Consultant shall provide Structural Engineering services for the design and construction of walls, bridges, and other structural items as required including structure selection reports, wall selection reports and plan sheets. Provide cost effective innovation and coordinate with the CDOT PM and CM for alternative selection. Collaboration with the aesthetic and landscaping requirements and the CSS process is to be expected.
- The Consultant shall follow the latest CDOT Bridge Design Manual Policies and Procedures. At the time of this SOW there is a January 2020 version.
- Project scoping shall also include a determination that a new structure is required, or rehabilitation of an existing structure is feasible. This determination shall be confirmed through preliminary design.
- Provide structure inspection services of existing walls.
- The consultant shall provide inspection services on existing bridge structures.
- Due to the size of this project, meetings with Staff Bridge prior to each milestone will be required for all FIR, DOR and FOR meetings.
- The preliminary design for major and minor structures, walls, and other miscellaneous structures within CDOT ROW shall be conducted as required to ensure that CDOT obtains a structure layout and type selection that achieves the project's objectives and minimizes revisions during the final design and construction phases.
- The Structure Selection Report is due by DOR.
- Coordinate required recommendations with the geotechnical engineer.
- The general scope of work includes, but is not limited to:
 - Bridge Replacement
 - Bridge Rehabilitation
 - Wall Design
 - Wall Rehabilitation



- New bridges
- Cantilever Monotube overhead signs
- Poles
- Fence
- Gates
- Any additional major/minor structures
- The design effort on this project may require alteration of existing walls to accommodate the desired roadway alignment and improvements.
- Participate in the survey SOW needs.
- This portion of the project will require a CSS aesthetic component.

2.7. HIGHWAY DESIGN AND TRAFFIC/SAFETY ENGINEERING

- Provide geometrical highway design and traffic engineering expertise for the Project Scope Elements.
- 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.
- Provide for Traffic and Safety Engineering recommendations.
- A preliminary alignment has been designed for the proposed improvements as part of the EA. The Consultant shall confirm or modify the EA 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. The safety revision and optimization effort shall be documented in a final memo.
- Provide traffic engineering expertise for crash reduction evaluation.
- 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 to complete the Project.
- 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.
- Coordinate with Structural Engineer for Structure Selection Report requirements.
- Provide recommendations for and layout of ITS components.

2.8. HYDRAULICS ENGINEERING

- The Consultant shall adhere to guidelines in CDOT's Drainage Design Manual and applicable Procedural Directives for drainage design work.
- 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.
- Prepare detailed design work of rundowns to convey water from the roadway.
- Bridge Work: Prepare Hydrology and Hydraulic Drainage Reports. Follow the CDOT Drainage Design Manual and refer to chapter 10, Bridges.
- Hydrology:
 - Determine the watershed hydrology
 - Visit the site and obtain and review flood history and data
 - Check for current floodplain studies and determine level of FEMA/CWCB level of coordination for a LOMR or LOMC if required
- Hydraulics Design Activities:
 - Complete a water-surface profile



- Analyze bridge opening sizes
- Locate and place the bridge crossings. Coordinate with CDOT Region 3 for input on the alternative evaluation to come to a consensus on the recommended plan.
- 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.
- Conduct a scour analysis
- Design revetment
- Provide required water elevations in the plan sheets
- Provide additional information as required by Region 1 Hydraulics Engineer (CDOT)
- Provide preliminary information, as noted above, for the FIR meeting
- Complete all documents for plans and reports as noted in the drainage design manual.
- Provide required plans per the CDOT Drainage Manual as well appropriate project specifications
- Coordination between Hydraulics, Geotechnical and Bridge Engineer will be required for FIR/DOR/FOR submittal timing
- Provide plans, specs, details, hydrology/hydraulic analysis, and drainage report of proposed storm sewer system per CDOT Drainage Manual.
- Integrate a new storm sewer system into the existing system considering recommendations and commitments from the EA.

2.9. ENVIRONMENTAL COMPLIANCE AND NEPA REEVALUATION(S)

- The Designer shall monitor and ensure that the Project adheres to all of the mitigations noted in the EA and decision document.
- Provide Environmental expertise as required to review project materials and ensure compliance with the EA and decision document.
- It is assumed that the design effort will realize an efficiency in the detailed effort that will require a Reevaluation of the EA, of which, the environmental portion of the work will be completed by the current consultant team as part of the decision document. The Consultant's role in this process shall be to provide design support to the existing EA team to advance toward a NEPA decision document. If additional changes warrant a Reevaluation(s) after the decision document, the Consultant will be responsible for developing that Reevaluation(s). Reevaluation work will require the Consultant to facilitate both the design and environmental scope.
- Provide guidance, expertise and coordination with FHWA for confirmation of the preferred alternative.
- The EA evaluated the following items for impacts and mitigation. The Consultant shall have the ability to reassess the following areas if impacted by changes after a decision document is issued that follows the appropriate NEPA guidelines and direction. Following are the required areas of expertise:
 - Air Quality
 - Biological Resources - wildlife, Threatened and Endangered species, wetlands, aquatic species and resources, vegetation, noxious weeds
 - Floodplains
 - Geologic Resources
 - Hazardous Materials
 - Cultural Resources - Section 106, Archaeology, Paleontology
 - Social Resources
 - Noise: This resource also requires a pre-construction benefitted receptor survey to determine whether or not the recommended noise wall will be built, which the Consultant will be required to develop and administer.



- Section 4(f) Historic and Non-Historic
- Recreational Resources
- Transportation Resources (safety, traffic, etc.)
- Utilities
- Water Quality
- Wetlands
- Visual

2.10. WETLANDS AND 404 PERMIT

- Provide expertise in identifying jurisdictional waters of the US (WOTUS), including wetlands, and non-jurisdictional connectors per current laws, regulations, and guidance pertaining to Section 404 of the Clean Water Act, and per current US Army Corps of Engineers regional wetland delineation standards and special requirements of the Omaha District and provide the appropriate level of 404 permitting. Guide CDOT through the permitting process and establish the timeline to keep the project on schedule for the desired construction start date.
- Update Wetland Determination, Field Delineation, and FACWet Functional Assessment if necessary due to changes after the decision document.
 - Ensure digital maps of wetland polygons, other waters of the US and ordinary high water mark (OHWM) areas are included in appropriate FIR, DOR, FOR and AD/CAP plan sheets. Coordinate with Project Surveyor to have wetland flags surveyed as necessary. All wetland mapping and reporting should be in accordance with the Corps Omaha District's Minimum Standards.
- Obtain Preliminary Jurisdictional Determination of wetlands and waters of the US from the US Army Corps of Engineers (USACE) Omaha District after coordination with CDOT R1 Wetland Biologist with the 404 permit application or pre-construction notification (PCN).
- Assist the State in obtaining a permit from the Army Corps for construction impacts and mitigation of wetlands. The actual impacts identified in the EA may change based on refined design and the Consultant shall be prepared for either a Nationwide permit or an Individual permit process:
 - Provide services required to obtain an Individual Permit through the Army Corps, or
 - Request for Nationwide Permit Authorization
 - Prepare a complete Pre-Construction Notification (PCN) for Section 404 Permitting. The PCN will include the wetlands delineation, a compensatory wetland mitigation plan with monitoring requirements, Section 7 and Section 106 reports, and all relevant plan and profile sheets showing wetland mapping and impacts, including information related to fills below OHWM in all waters of the US. Include appropriate volumes of riprap, and appropriate grading and structure plans. Coordinate the appropriate information with the CDOT R1 Wetland Biologist prior to submitting to the Corps.
 - Review plans for compliance with 404 permit.
- Provide: Plan sheets with revegetation recommendations; seed mixes, plant lists and revegetation notes; Draft Permit to CDOT, Final Permit submitted to Corps including final conceptual wetland mitigation and monitoring plans; comments on drawings and specifications.
- Integrate this process and expertise into the SCAP and SWEEP effort for potential on-site mitigation requirements or enhancements around bridge(s). The State may choose to provide additional riparian enhancements above and beyond the 404 requirements to meet stakeholder needs.



2.11. ITS AND UTILITY ENGINEERING

- ITS components shall be designed such that they are fully integrated into the CDOT ITS Network.
- 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.
- The Designer shall provide design plans for all required utility installations for all ITS components of the project.
- Provide all required expertise for areas requiring lighting and electronic components.
- As part of the scoping process, prepare an assessment of all the utility needs and all Intelligent Transportations Systems (ITS) and Network Services.
- Follow CDOT SUE guidelines for existing conditions survey.
- Provide SUE compliant plans following Senate Bill 18-167.

Subsurface Utility Engineering (SUE)

Utility Investigation Activities - the scope of work for utility investigation may include:

- a. The Consultant shall conduct and document an investigation of the project area to determine existing utility conditions within the project limits. As part of the investigation the Consultant will meet with all utility providers and collect utility key maps for all utilities in the project area, identify all known utilities: including lighting, irrigation, ITS, storm sewer, ownership, type, size and special conditions should utility relocation be required, and research and obtain copies of utility easements (public and private) and utility franchise agreements to determine conditions under which the utility was established in its present location (e.g. by revocable permit or by a privately owned easement. The utility investigation requirements are to meet Quality Levels A and/or B as required under CI/ASCE 38 or explain why QLA/B could not be achieved. The Consultant shall employ Professional Engineers who are able to stamp plans.
- b. Project Goals
 - 1) Quality Level B involves the use of Quality Level D and C methods of utility investigation plus the use of surface geophysical techniques to determine the existence and horizontal position of underground utilities. This activity is called "designating." The information obtained in this manner is surveyed to project control. Two-dimensional mapping information is obtained. This information is usually sufficient to accomplish preliminary engineering goals.
 - 2) Quality Level A involves the use of Quality Level D, C and B methods of investigation plus the use of minimally intrusive excavation methods at critical points to determine the precise horizontal and vertical position of underground utilities, as well as the type, size, condition, material, and other characteristics. This activity uses test holes (sometimes called Locating). It is the highest level presently available. When surveyed and mapped, precise plan and profile information is available for making final design decisions. Records research shall include but limited to the following sources:
 - 811 Notification
 - Contacts List



- Public Agencies
 - Utility Owner
 - Colorado 811
 - County Clerk’s Office
 - Landowner
 - Internet Search
 - Visual Site Inspection
 - Irrigation Companies
- 3) 3D Modeling involves the use of CADD to depict the precise horizontal and vertical profile of each utility in areas of high conflict. This tool is only utilized where precision locating and design of utilities is essential for project success. Some areas of the project may require 3D modeling and will be determined after 60% design, but the ability to model utilities within CDOT’s MicroStation workspace may be required in a supplemental SOW.
- c. Utility Investigation Methodology
- 1) Project Scoping
 - a) Quality Level B Utility Investigation
 - b) Use existing survey project control data, GIS data, plans and electronic data from utility providers, and field survey to prepare utility design plans that meet ASCE Quality Level (QL) B identified within the project limits identified within CDOT’s SUE checklist (provided by CDOT). The QLB areas will be determined between the SUE Consultant and CDOT’s UEPM. Survey accuracy of all observations shall be in accordance with CDOT’s Survey Manual.
 - 2) FIR (Field Inspection Review)
 - a) This work is performed at 30% design, prior to FOR Plan development
 - b) Quality Level A Utility Investigation
 - 3) FOR (Final Office Review)
 - a) This work is performed at 60% design, during FOR Plan development
 - b) 3D Modeling
 - 4) PS&E (Plans, Specifications & Estimate)
 - a) Ready for Utility Clearance and Advertisement
- d. Deliverables
- 1) Project Scoping:
 - a) PointMan CDOT’s live Subsurface Utility Mapping mobile application will be available for all designated utilities during the SUE survey or submit a shape file of all existing utilities found during the SUE survey if PointMan is not used.
 - b) The end product (the CADD file and project plans) that contain the horizontal location of utilities, ownership, type, and size of the line including any special conditions of the line.



- c) The CADD file and project plans should depict the lines in approved CDOT utility line type standards and colors, include all utility easements, and power source locations with easements, per CDOT's available CADD workspace.
 - d) Define limits of work SUE work and include SUE report per ASCE 38 Standards. SUE report shall be included, and will include the following if requested by CDOT:
 - e) All overhead utilities and pole inventory and including guy anchors-Power source diagrams
 - f) Telephone source diagrams
 - g) Fiber optic diagrams
 - h) Storm sewer diagrams
 - i) Water diagrams
 - j) Sewer diagrams
 - k) Vault diagrams
 - l) Easements shown on plans
 - m) Produce a utility contact list: Including utility provider, contact name, email address, work & cell phone numbers. Used for both utility notes and specifications.
 - n) The utility plan sheets will include the utility line work with proper designation colors.
 - o) Complete scoping design for utility plans.
 - p) Include service line locations for water, sewer, electrical, communications and natural gas.
 - q) Show transmission main lines and secondary feed lines with labels.
 - r) Distinguish lines between CDOT owned facilities, local agency facilities and utility provider facilities.
 - s) Produce utility plan sheets for review with utility providers including an oversize plan sheet for coordination and meetings.
 - t) Include known easements for the utility providers; inside, adjacent to and outside CDOT ROW on the utility plans.
 - u) Provide a table for each utility provider that includes size and type of the providers' facilities.
 - v) Include manhole rim labels and inverts in and out labels that match CDOT project datum elevation.
- 2) FIR (Field Inspection Review)
- a) Provide for and manage the test hole services, including permitting.
 - b) Provide a test hole map for survey locates.
 - c) Provide a test hole test hole chart and incorporate test hole location into the FIR Utility Plans. In the event there is insufficient design available to perform the test hole activities prior to FIR, the consultant shall coordinate the final test hole work into the FOR plan level submittal
 - d) Sewer/Storm manholes will be verified; rim elevations, inverts in and inverts out, include pipe size and pipe material. Include labels for other sewer appurtenances, lift stations, drop manholes, vents and force mains.
 - e) Water lines to be verified; elevations for valve boxes including size, pipe size and pipe material. Include labels for other water appurtenances, air vacs, PRV vaults, vents and curb stops.



- f) Dry utility labels for vaults, pull boxes, manholes, drop down transformers and other providers attached to all overhead utility line poles.
- 3) FOR (Final Office Review)
- a) If requested provide Utility 3-D modeling in high conflict areas where precision placement of utilities is deemed essential.
 - b) Support CDOT with the development of cross sections leveraging SUE deliverables with both vertical and horizontal data.
 - c) Support the development of drainage profiles leveraging SUE deliverables with both vertical and horizontal data.
 - d) Support wall and bridge profiles leveraging SUE deliverables with both vertical and horizontal data.
 - e) Support CDOT with Landscape plans leveraging SUE deliverables with both vertical and horizontal data.
 - f) Support CDOT with signal and lighting plans leveraging SUE deliverables with both vertical and horizontal data.

DESIGN PHASE – Utility Coordination

- 1) Project Scoping
- a) Act as liaison between CDOT and the utility companies during design as it pertains to information, scheduling, coordination and documents.
 - b) The Consultant will be responsible for obtaining all permits for work within CDOT ROW related to SUE investigations separate from the SUE consultant.
 - c) Coordination of scoping meetings with all utility providers and meeting minutes.
 - Using CDOT Utility Checklist for each utility provider.
 - Coordinating work with SUE consultant
 - Obtain GIS information from utility providers
 - d) Request and receipt of utility maps and easements from utility companies will be coordinated with CDOT project manager and with CDOT Utility Engineering Program Manager (UEPM).
 - e) The consultant will conduct a review of utility information share findings with SUE consultant and CDOT UEPM.
 - f) Request franchise agreements from the local agencies. Determine responsible party for cost implications.
 - g) Request any secondary utility provider feeds, laterals, services and other attachments to the main utility provider's facility.
 - h) Consultant to work with SUE consultant, surveyor and CDOT UEPM that information is adjusted and matches CDOT project datum.
 - i) Provide photos of existing utility facilities and conditions in the project limits.
 - j) Review and comment on SUE related plans with CDOT project manager and CDOT UEPM.
 - k) Develop mapping and associated pertinent information of existing utilities, street lighting, and irrigation ditch facilities within the project limits of each construction project. underground-at grade-overhead utilities



- l) Ascertain and define all utility, street lighting, and irrigation ditch conflicts within the highway construction project limits by an in-depth review of complex highway plans. Contact individual utility, and irrigation companies to convey and jointly resolve these conflicts. The typical construction project requires contact with 4-6 individual companies.
 - m) Schedule and conduct subsequent meetings with utilities to resolve complex issues.
- 2) FIR (Field Inspection Review)
- a) Coordination of FIR meetings with all utility providers and meeting minutes. (Both Office and Field)
 - b) Review, recommend revisions, and approve relocation and/or installation plans developed by utility companies to insure compatibility with CDOT construction plans. This process requires input from and coordination with CDOT construction and design personnel, and appropriate State and Local agencies.
 - c) Use CDOT's Work Plan (template to be provided) document for non-reimbursable relocation, modification and/or adjustment of existing utilities, irrigation ditches and street lighting companies. These documents describe work that must be performed in a prescribed time and method and require signatory concurrence from the affected company and appropriate CDOT personnel.
 - d) Use CDOT's Utility Conflict Matrix plan sheet (template to be provided) to develop and review utility matrix conflicts with CDOT UEPM and work on a preliminary plan of action.
 - e) Produce and review a proposed test hole location map with CDOT UEPM.
 - f) The consultant will coordinate with SUE consultant, CDOT UEPM, test hole provider and survey company on test hole schedule along with field site coordination.
 - g) The Consultant will be responsible for obtaining all permits for work within CDOT ROW related to SUE investigations separate from the SUE consultant.
 - h) Provide a matrix of potential utility conflicts utilizing CDOT's standard utility conflict matrix plan sheet.
 - i) Produce utility plan sheets for review with utility providers including an oversize plan sheet for coordination and meetings.
 - j) Complete FIR design for utility plans.
 - k) The utility plan sheets will include the utility line work with proper designation colors, per CDOT's MicroStation workspace.
 - l) The consultant will coordinate with CDOT project manager and CDOT UEPM and utility companies on the FIR design plans for review and comment.
 - m) Review and interpret all FIR plans to insure that utility facilities have been accurately and completely depicted, including field verification of all utility locations.
 - n) Schedule and conduct subsequent meetings with utilities to resolve complex issues.



- p) Initiate and prepare contracts with utility companies for reimbursable modifications. Review estimates for content, check mathematical accuracy, and submit for CDOT signatures and authorization, in compliance with all CDOT, State and Federal rules and regulations. Following issuance of the notice to proceed, act as primary contact for coordination of design, bidding, construction and billings.
 - q) Responsible for creation of final utility specification documents and preparation of subsequent written certification to proceed with construction. The utility specification defines the process to be followed for performance of utility, street lighting, railroad, and irrigation ditch relocations or installations. This includes who will perform the work, when it will be performed, time allotted for the work, and method of construction.
- 4) PS&E (Advertisement)
- a) Coordination of PS&E meetings with all utility providers and meeting minutes. (Both Office and Field)
 - b) Final coordination with the utility providers on the potential relocation areas.
 - c) Produce and coordinate final utility notification letters for review.
 - d) Prepare and coordinate final utility cost relocation estimates for budget and utility contracts.
 - e) The consultant will coordinate with SUE consultant, CDOT project manager, CDOT UEPM and utility companies on the PS&E design plans for review and comment.
 - f) Review and interpret all PS&E design plans to insure that utility facilities have been accurately and completely depicted, including field verification of all utility locations.
 - g) Schedule and conduct subsequent meetings with utilities to resolve complex issues. Review billings and preparation of payment documentation pertaining to work performed under utility and railroad reimbursable contracts to insure compliance with CDOT, State and Federal rules and regulations. This process includes obtaining written concurrence from CDOT personnel, and/or performing personal site inspection, to verify that work was performed in accordance with said contracts.



2.12. PROJECT COORDINATION

In addition to the stakeholders listed in **Section 1.6.**, the CM shall partner and coordinate with the groups below. The CDOT Project Management Team (defined below) shall be included in all coordination.

- Executive Oversight Committee
- CDOT Project Management Team
 - CDOT Program Engineer – Mike Keleman, PE
 - CDOT Regional Environmental Manager – Vanessa Halladay
 - CDOT Project Director – Kurt Kionka, PE
 - CDOT Design Project Manager – Tyler Brady, PE
 - CDOT Construction Project Manager – Jeff Hampton, PE
- CDOT Specialty Groups
 - Region 1 Materials
 - Region 1 Traffic
 - Region 1 Hydrology and Hydraulics
 - Region 1 Survey
 - 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 Consultant and Subconsultants
- Project Construction Manager (Owner's representative in construction) and any subcontractors
- ICE
- CDOT Engineering Estimates and Market Analysis (EEMA) Group
- CDOT Maintenance Forces
- Headquarters and Regional Civil Rights Manager
- HPTE
- Bridge Enterprise



2.13. PROJECT CO-LOCATION

Plans to co-locate with the Design Team and CM for the preconstruction phase of this Project and throughout construction will be determined after selection. The location and timeframe for co-location is to be determined but is anticipated to be in the Denver Metro or within the Project vicinity. Co-location is at the discretion of CDOT.

2.14. CSS STAKEHOLDER EFFORT

The goal of the CSS Stakeholder effort is to continue the collaborative approach to decision-making that has been employed as part of the preliminary 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. The CSS process shall be incorporated 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 for each to move forward in a timely, unimpeded manner with no backtracking.

This section covers the 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. The following are the estimated required meetings:

- Project Leadership Team (PLT) Meetings – 12 estimated
- Technical Team (TT) Meetings – 12 estimated
- Issue Task Force (ITF) Meetings
- Stream and Wetland Ecological Enhancement Program (SWEEP) Meetings - 6 estimated
- Emergency Response Meetings - 4 estimated
- A Landscape Level Inventory of Valued Ecosystem Components (ALIVE) Meetings - 4 estimated
- Greenway Meetings - 4 estimated
- Other ITF Meetings determined through the I-70 Mountain Corridor CSS process - 12 estimated
- Preconstruction Public Meetings – 4 estimated



SECTION 3 – EXISTING FEATURES

3.1. STRUCTURES

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.

- F-15-BV
- F-15-BR
- F-15-BH
- F-15-CR
- F-15-D
- F-15-CQ
- F-15-BX
- F-15-BZ
- F-15-CM
- F-15-BL
- F-15-BM
- F-15-CA
- F-15-CB

3.2. UTILITIES

Anticipated Utility Relocation/Coordination:

- Cable Television (Comcast)
- Electric (Xcel Energy)
- Fiber Optic/Communications (CDOT and Zayo)
- Gas (Xcel)
- Sanitary Sewer (ERWSD)
- Water
- Storm Sewer (CDOT)
- Other unknown utilities may exist

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

3.3. IRRIGATION DITCHES

None Anticipated

3.4. RAILROADS

None Anticipated

3.5. PERMANENT WATER QUALITY CONTROL MEASURES

Existing Permanent Water Quality Features exist within the Project Limits. Each will have to be evaluated using current design criteria and determination made on incorporation.

3.6. WATER FEATURES

- Clear Creek
- Sawmill Gulch
- Johnson Gulch
- Beaver Brook
- Soda Creek
- Other Tributaries



SECTION 4 – GENERAL INFORMATION

4.1. NOTICE TO PROCEED

Work shall not commence until the written Notice-to-Proceed is issued by CDOT. 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

4.2. PROJECT COORDINATION

See Section 2 – Project Management and Coordination

4.3. ROUTINE REPORTING AND BILLING

The Consultant shall provide the following on a routine basis:

- Coordination:
 - Coordination of all contract activities by the C/PM
- Periodic Reports and Billings:
 - The periodic reports and billings required by CDOT Procedural Directive 400.2 (Monitoring Consultant Contracts), including monthly drawdown schedules.
 - Consultant Invoicing Guidelines. Please provide the following seven sections and information in each invoice in the following order:
 1. Form 1313
 2. Invoice
 - Provide invoice in a similar format to the original PCW
 - Noting each employee, time worked, multiplier, 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
 - 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
 - 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. Progress Report shall be submitted 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.
 - 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.



- A report 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.
 - A description of the cause for delays beyond the planned completion of time of work activities or milestones contained in the project.
 - 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 showing 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.
 - 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.
 - Documentation of meetings that were held during the subject time period.
 - 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
 - The Prime, Sub-consultants and Vendors shall submit detailed hourly back up of effort noting time/date of activities and number of hours or costs. Lodging backup shall be submitted through ODC backup.
 6. ODC backup – Only Submit documentation pertaining to the project and the invoice
 - Provide a summary of ODC Cover sheet
 - Purpose of trip, Date of Trip, Who went
 - 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.
- 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.

4.4. PROJECT DESIGN DATA AND STANDARDS

- **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.
- **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 5 – WORK ACTIVITY ASSIGNMENTS

This list establishes the consultant's individual task responsibility. The consultant shall maintain the ability to perform all work tasks which are indicated below by an 'X' mark in the consultant column in accordance with the applicable CDOT standards. Selected work tasks shall be assigned only after coordination and consultation with CDOT. The Project Team is responsible for coordinating the required work schedule for those tasks accomplished by CDOT and other agencies. **Many of the included Consultant Responsibilities revolve around maintaining and providing the appropriate expertise for the Reevaluation of the decision document if required. Some are marked with an * asterisk.**

<u>PRECONSTRUCTION</u>	CDOT/Other	Consultant	Notes
A. Project Initiation and Continuing Requirements:			
1. Initial Project Meeting	_____	_____X_____	
2. Review Environmental Mitigation Requirements	_____	_____X_____	
3. Independent Design Review	_____	_____X_____	
4. Project Schedule	_____	_____X_____	
5. Develop Design Criteria	_____	_____X_____	
6. Initiate Survey (Map Preparation)	_____	_____X_____	
7. Right-of-Entry and Permits	_____	_____X_____	
8. Traffic Control	_____	_____X_____	
9. Initial Submittals	_____	_____X_____	
10. Progress Meetings	_____	_____X_____	
11. Structure Review Meetings	_____	_____X_____	
12. Project Management	_____	_____X_____	
B. Project Development:			
1. Communication and Consensus Building			
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			
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. Project Control	_____	_____X_____	
e. Photogrammetry			



1.	Camera Calibration Report	_____	_____	
2.	Flight Plan	_____	_____	
3.	Flight	_____	_____	
	4. Contact Prints	_____	_____	
5.	Negatives	_____	_____	
6.	Enlargements	_____	_____	
7.	Photo Index	_____	_____	
8.	Supplemental Survey (wing points)	_____	_____	
	f. Supplemental Surveying	_____	X	Confirmation of existing information
	g. Accuracy Tests	_____	X	
	h. Review (by Registered Professional Land Surveyor)	_____	X	
4.	Conceptual Design	_____	_____	
a.	Aesthetics	_____	X	Provide optimization of improvements
	b. System Feasibility	_____	X	
	c. Alternatives Analysis	_____	X	
	d. Final Alternatives Reports	_____	X	
	e. Interchange Approval Process	_____	X	
5.	Data Gathering Analysis, and Mitigation Development	_____	_____	
a.	Traffic Related	_____	_____	
	1. Traffic Study	_____	X*	
2.	Accident Study	_____	X*	
3.	Noise Study	_____	X*	
4.	Air Quality	_____	_____	
a.	Air Quality Monitoring	_____	_____	
	b. Air Quality Analysis	_____	X*	
	2. Alternate Transportation Sys.	_____	_____	
b.	Archaeology	_____	_____	
	1. Gather Data & Analysis	_____	_____	
	2. Mitigation Implementation	_____	X*	
c.	Paleontology	_____	_____	
	1. Gather Data & Analysis	_____	_____	
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			
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			
t. Energy Usage			X
2. Environmental Assessment (EA) Process			* Potential Reevaluation after decision document
3. Environmental Impact Study (EIS) Process			
4. Design Report Process			X
5. 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		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		
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.	Truck Escape Ramps		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		
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		
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		
a.	Initiate ROW Authorization Process		X
b.	Final Utility Plans		X
c.	Final Railroad Plans		
6.	Right-of-Way		
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		
a.	Materials Data		X
b.	Stabilization validity		X
c.	Stabilization Plan		X
8.	Traffic Engineering		
a.	Permanent Signing/Pavement Marking Plans		X
b.	Signalized Intersections		X
c.	Traffic Control Plan		X
9.	Roadside Planning		
a.	Landscaping		X
b.	Other		X
1.	Sprinkler systems/Liquid Anti-Icing		X
2.	Bike paths		X
3.	Sound barriers		X
4.	Truck escape ramps		X
5.	Rest Areas		
6.	Guardrail and delineator		X
7.	Safety analysis		X
c.	Lighting Plans		X
10.	Roadway 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		

SERVICES AFTER DESIGN	CDOT/Other	Consultant	Notes
A. Review of Shop Drawings		X	
B. Construction Services			
1. Coordinate Schedule		X	
2. Provide field observation			
a. Pile driving/caisson drilling		X	
b. Major concrete pours		X	
c. Placement of girders		X	
d. Splicing of girders		X	
e. Post-tensioning duct and anchorage placement		X	
f. Post-tensioning operations		X	
3. Technical assistance			
a. Design Support during Construction		X	Provide services after submittal of construction package, not full CM services
4. Submittals			
a. Diary		X	
b. Documentation/justification		X	
c. Progress reports		X	
d. Calculations, drawings, and specifications		X	
e. Daily time sheets		X	
C. Post Design Plan Modifications			
D. Post Construction Services:			
1. Final earthwork determination			
2. As-built plans			
3. Revisions to Right-of-Way Plans (Excess Land)		X	
4. Monument ROW		X	



5.	Set Property Corners (Remainders)	<u> </u>	<u> X </u>
6.	Deposit ROW Plans	<u> </u>	<u> X </u>
E.	Construction Engineering	<u> </u>	<u> </u>



SECTION 6 – 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 Compatible Data – Openroads Designer	_____	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 Assessment		X*
17.	Wetlands Findings Report		X*
18.	Hazardous Materials Findings		X*
19.	Environmental Assessment (EA)		
a.	Preliminary EA		
b.	Certified Verbatim Transcript		
c.	Finding of No Significant Impact (FONSI)		
20.	Environmental Impact Statement		
a.	Draft EIS		
b.	Certified Transcript of Meeting		
c.	Final EIS		
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.	Preliminary Design		X
a.	Electronic Survey		
b.	Traffic Data & Recommendations		X
c.	Soils Investigation Report		X
d.	Pavement Design Report		X
e.	Existing Bridge Condition Report		X
f.	Foundation Investigation Report		X
g.	Engineering Geology Plan Sheet(s)		X

* This project needs to cover the mitigation requirements from the EA AND the Consultant needs to provide the expertise for and develop a Reevaluation if necessary (after a decision document is issued)



	h. Preliminary Hydraulics Report		X
	i. Utility Relocation Recommendations		X
	j. Ditch Structure Plans		X
	k. Stabilization Plan		X
	l. FIR Plan Set		X
24.	Final Design		
a.	Corrected FIR Plan Set		X
	b. Preliminary Cost Estimate		X
	c. List of Deviations from Standard Design Criteria		X
	d. Final Hydraulics Report		X
	e. Signing/Pavement Marking Plans		X
	f. Signal Warrants		
	g. Signalized Intersection Plans and specifications		X
	h. Traffic Control Plan		X
	i. Structural Selection Report		X
	j. Foundation Investigation Request		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. Sound Barrier Plans & Specs.		X
	f. Truck Escape Ramp Plans & Specs.		X
	g. Rest Area Plans & Specs.		X
	h. Lighting Plans		X
C. Right-of-Way			
1.	Title Commitments		X

* Provide expertise for and develop a Reevaluation after a decision document if necessary



2. Preliminary Ownership Map (include in the FIR plan set)	_____	_____
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):

- No. 27.1 Social Marketing – Use of Web 2.0 and Similar Applications
- No. 31.1 Website Development
- No. 400.2 Monitoring Consultant Contracts
- No. 501.2 Cooperative Storm Drainage System
- No. 514.1 Field Inspection Review (FIR)
- No. 516.1 Final Office Review (FOR)
- No. 1217a Survey Request
- No. 1304.1 Right-of-Way Plan Revisions
- No. 1305.1 Land Surveys
- No. 1601 Interchange Approval Process
- No. 1700.1 Certification Acceptance (CA) Procedures for Location and Design Approval
- No. 1700.3 Plans, Specifications and Estimates (PS&E) and Authorization to Advertise for Bids under Certifications Acceptance (CA)
- No. 1700.5 Local Entity/State Contracts and Local Entity/Consultant Contracts and Local Entity/R.R. Contracts under C.A
- No. 1700.6 Railroad/Highway Contracts (Under Certification Acceptance)
- No. 1905.1 Preparation of Plans and Specifications for Structures prepared by Staff Bridge Branch

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)

A.5. AREA:

- County of Clear Creek Roadway Design and Construction Manual, Latest



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
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
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
D&RGW	Denver & Rio Grande Western Railroad
EA	Environmental Assessment
EIS	Environmental Impact Statement
ESAL	Equivalent Single Axle Load



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
PAPER SIZES	See Computer-Aided Drafting Manual (CDOT); Table 6-13 and Table 8-1
PE	Professional Engineer registered in Colorado
PM	Program 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
SFHA	Special Flood Hazard Area
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



APPENDIX C: PROJECT LEADERSHIP TEAM DRAFT PROJECT GOALS

A. Improved I-70 Safety, Mobility and Operations

Improve the safety, mobility, and operational characteristics of the I-70 corridor by replacing aging infrastructure, minimizing substandard design and atypical interchanges, achieving a 55 miles per hour (“mph”) design speed where feasible, and maximizing travel time reliability throughout the corridor. Improve emergency response times and provide redundant access for local residents. Maximize safety of workers, traveling public, residents, and business owners during construction.

B. Stakeholder Commitment, Partnership, and Environmental Stewardship

Facilitate and foster collaboration, communication, and partnerships among all stakeholders throughout the five life cycle phases of the I-70 Mountain Corridor Context Sensitive Solutions (“CSS”) process as outlined in Appendix A of the Final Programmatic Environmental Impact Statement (“PEIS”). Maintain the design guidance developed through CSS in all phases. Implement innovative methods for environmental stewardship and community supported enhancements that maximize opportunities for shared-use within and adjacent to the I-70 Corridor. Community supported enhancements include but are not limited to: wildlife mitigation and frontage road access to amenities such as the Clear Creek Greenway from Veterans Memorial Tunnels to US 6. Adherence to all environmental compliance requirements, including those documented in the I-70 Mountain Corridor PEIS/Record of Decision (“ROD”) commitments and stakeholder agreements while minimizing impacts to both the environment and the aesthetics of the corridor.

C. Minimize Construction Impacts

Minimize inconvenience to the traveling public, residents, and business owners during construction. Accommodate and maintain freight and interstate travel providing motorists access to recreation and jobs along the corridor. Provide accurate, meaningful, and timely communication to minimize construction impacts and create a reliable communication system for disseminating information.

D. Fiscal Responsibility, Resources, and Project Scope

Optimize the Project scope with the available financial resources, i.e. getting the largest scope from the given budget. Clearly define Project risks to achieve cost certainty as soon as possible to fully understand Project costs and define the Project scope. Provide packaging and phasing flexibility with currently available financial resources while still maintaining CDOT’s commitment to build the entire Project.

E. Schedule

Implement the final design and commence construction so that the Project can be open to traffic as soon as possible to address the deteriorating bridge and economic impacts to the State from congestion on I-70. Achieve a 2022 calendar year construction commencement to minimize inflation costs of the Project.