

SCOPE OF WORK

CONTRACT TYPE

Specific Rate of Pay
Cost Plus Fixed Fee
Other

CONTRACT DATE: January 2020

PROJECT NUMBER: FBR 0702-385

PROJECT LOCATION: I-70 MP 211 over Forest Service Road (F-13-S_Minor)

PROJECT CODE: 22712

THE COMPLETE SCOPE OF WORK INCLUDES THIS DOCUMENT (ATTACHED TO THE CONTRACT FOR CONSULTANT SERVICES)

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SECTION 1 PROJECT SPECIFIC INFORMATION

1. PROJECT BACKGROUND

The Colorado Bridge Enterprise (BE) listed structure F-13-S_Minor as eligible for FASTER funding as a result of the structure becoming Poor (structurally deficient) based on an inspection performed on July 24th, 2017. Prior to the structure becoming structurally deficient (SD), it was classified as functionally obsolete (FO) due to insufficient vertical clearance.

F-13-S_Minor serves as a grade separation structure and is located on Forest Service Road in Summit County. It crosses under I-70 at mile post 211, approximately 2.6-miles west of the Eisenhower-Johnson Memorial Tunnel. The structure slopes from north to south at 7.2% grade, and I-70 slopes from east to west at 6% in the westbound direction and 7.5% in the eastbound direction. The structure is used as a turn-around for CDOT Maintenance and emergency vehicles. Forest Service Road is closed to the public, it also provides access to Straight Creek which CDOT maintains. Although the structure is not used as a drainage passage, it conveys flows during spring runoff when the adjacent storm water infrastructure is covered with snow and during heavy rainfall events when the adjacent storm water infrastructure is at capacity or impacted by sediment.

Structure F-13-S_Minor was originally constructed in 1964, it is a single celled concrete box culvert (CBC) 14-feet high, 20-feet wide, 194-feet long. The structure was originally designed for a maximum of 12-feet of fill over eastbound/westbound and for a maximum of 5-feet of fill over the median and structure ends, the design was based on the original alignment/profile of I-70. In 1964, initial construction of I-70 triggered multiple landslides north of I-70, approximately between MP 210 and 212. These landslides are known as Slides 1 through 4 and Slides A and B.

The western edge of Slide 1 is located approximately 160-feet east of the structure, and was mitigated in 1969 through means of slope regrading/excavating and drainage ditches/pipes to reduce hydrostatic pressure buildup within the decomposed bedrock material. Landslide mitigation then shifted alignment of I-70 to the south, and resulted in extending the structure's original length of 164-feet to 194-feet. Regrading also raised the profile of I-70 westbound, resulting in 18-feet of fill over the westbound portion of the structure. However, design of the structure remained at a maximum fill of 12-feet. Today, the fill over the structure varies from 6-feet to 18-feet.

In August of 2017, Region 3 began investigations to assess the complexity of replacing or repairing the structure. Due to the severity of the structural deficiencies and insufficient vertical clearance of the structure, it was determined replacement would be required. With considerations to the Interstate high traffic volumes, critical culverts at Straight Creek, active landslides north of I-70 (especially Slide 1), potential wildlife considerations per the I-70 Mountain Corridor Programmatic Environmental Impact Statement (PEIS), fiber optic lines along I-70, the Region concluded to complete a Feasibility Study to help identify all potential issues with replacing the structure.

In August of 2018, Region 3 contracted the assistance of a consultant to complete a Feasibility Study. Due to Interstate high traffic volumes, the team evaluated the feasibility of tunneling methods to limit traffic impacts during construction. Tunneling construction methods were found not feasible for the structure replacement due to non-cohesive materials under I-70. The following tasks were completed under the Study: survey, geotechnical investigation, preliminary environmental review, hydraulic overview, utility identification (Quality Level D), roadway assessment, structural concepts for replacement and shoring, conceptual construction phasing, Accelerated Bridge Construction (ABC) opportunities, and preliminary estimates for three conceptual alternatives. The Feasibility Study Report is available to all interested.

Moving forward with Design and Construction, challenges include but are not limited to: maintaining Interstate high traffic volumes, complex phasing and shoring, adjacent landslide, steep grades, non-cohesive soils with large boulders, short construction season, and nighttime environmental restrictions.

Project Design and Development Status: Below is a general description of work progressed to date and anticipated ongoing work, milestones, and potential early packages:

- **Design:** Conceptual activities have been conducted under a Feasibility Study to determine impacts associated with the structure replacement. Design has not started and will accommodate input from the CM/GC contractor in the pre-construction phase through the CM/GC Project Delivery Method.
- **Structural:** Conceptual design for proposed structure alternatives has been developed to an approximate 10% level which generally represents feasible options for replacement acceptable to CDOT.
- **Roadway:** Conceptual design for this section of the I-70 corridor has been developed to an approximate 10% level which generally represents feasible geometric and resiliency improvements acceptable to CDOT.
- **Hydraulics:** Hydraulic overview of the project area was conducted to evaluate the existing drainage system. It was found to have sufficient storage and capacity to handle the 50-year event when properly maintained. Identification of I-70 drainage system's connection depths and locations shall be completed during design. Any changes to the median will impact the median drainage and will need to be addressed in design.
- **Geotechnical and Geohazards:** Geotechnical investigations have been completed for the bridge structure, final recommendations were used for the conceptual design of structural foundations and shoring for construction phasing. Final recommendations shall be used for final design of the bridge structure and shoring as needed for construction phasing. However, an additional geotechnical investigation may be required for the proposed median wall if pursued for design. An overview of geological conditions and hazards was also completed and recommendations have been provided for avoidance and mitigation during construction. The consultant shall work with CDOT and the CM/GC contractor to assess mitigation requirements for the adjacent landslide.
- **Environmental:** A desktop environmental review of the area was performed under the Feasibility Study. Overall, very few, if any resources are anticipated to be impacted by construction. Given the low probability for impacts to environmental resources, it is anticipated for the project to be cleared with a Categorical Exclusion (CatEx). The NEPA process will occur during design and will be completed by CDOT.
- **ROW:** All existing right-of-way (ROW) is within an existing Highway Easement Deed (HED) through the United States Forest Service (USFS) and therefore, no ROW issues are anticipated. Authorization from USFS will be required for construction.
- **Survey:** Field survey has been completed for the structure area. However, additional survey will be required for extended portions of I-70 if the median wall and realignment WB is pursued for design. A stamped project control diagram is available and shall be used for design to tie the surveys together.
- **Utilities:** An ASCE Quality Level D Subsurface Utility Engineering (SUE) investigation has been conducted for the project area. However, the underground utilities that run along I-70 will require Quality Level B or higher during design. The consultant should note the following known utilities: CenturyLink underground fiber optic runs parallel south of EB I-70; Comcast underground fiber optic runs parallel north of WB I-70 (shared duct with CDOT); CDOT underground fiber optic runs parallel north of WB I-70 (shared duct with Comcast fiber optic), Xcel Energy underground electric runs parallel north of WB I-70.

2. PROJECT GOALS

Preliminarily, this project is intended to produce the following improvements:

- A. Replace Structure F-13-S_Minor with a new structure that meets 100-year design life criteria and qualifies for full funding through the Colorado Bridge Enterprise Program.
- B. Accommodate two-way traffic in new structure below I-70 and meet vertical clearance requirements.
- C. Facilitate and foster collaboration, communication, and partnerships among all members of the project team, including CDOT and the Construction Manager/General Contractor (CM/GC) contractor.
- D. Minimize Interstate traffic impacts.
- E. Target construction season between June and October, one construction season duration is preferred but not required. Accelerated Bridge Construction methods shall be incorporated into the structural design.
- F. Design and Construct a Quality Project.
- G. Meet Schedule and Budget.
- H. Environmental - Adhere to all environmental compliance requirements.
- I. Stakeholder Involvement.
- J. Public communication - Provide accurate, meaningful, and timely communication to the public concerning the project.

3. PROJECT LIMITS

This project is located on I-70 over Forest Service Road. Construction limits on I-70 are between milepost 210.50 and milepost 211.5 in Summit County.

4. WORK ELEMENTS

The consultant will develop Construction Plans and applicable reports. The work will include but not limited to the following:

5. PROJECT MANAGEMENT

- Develop and track a design budget.
- Develop the Project Execution Plan to document the project plan and establish internal project management controls.
- Communicate project control requirements to the design team and ensure the established controls are followed.
- Coordinate activities with design leads, subconsultants, CDOT, and the CM/GC contractor.
- Provide acceptable monthly updates to CDOT on progress, schedule, budget, and project issues.

6. PROJECT MEETINGS

The consultant will, unless otherwise directed, meet with CDOT at the Mountain Residency located at: 1198 S Adams Ave, Silverthorne, CO 80498. Meetings with local agencies, utility companies, stakeholders and meetings requiring field visits will be held on site or at the CDOT Mountain Residency Office. The consultant will prepare handouts, graphics, and agendas for meetings and produce meeting minutes and make revisions as requested. The following meetings shall be included in the consultant's scope:

- Project Kickoff
- CM/GC Partnering and Project Scoping Workshop
- Pre-Survey Meeting
- Field Inspection Review – 30%
- Pre-Final Office Review - 60%
- Final Office Review - 90%
- Final Construction PS&E -100%
- CM/GC Risk Management Meetings
- Cost Estimate Review Meetings
- Other Project Meetings:
 - Weekly project updates to CDOT Project Manager (by phone)

7. ESTIMATED MILESTONES

The consultant shall have the capacity to meet the following estimated milestones:

- Project Kickoff: 1/29/20
- CM/GC Partnering and Project Scoping Workshop: 1/29/20-1/30/20
- Field Inspection Review Submittal (FIR-30%): 5/14/20
- Field Inspection Review Meeting (FIR-30%): 5/28/20
- CM/GC Risk Management Meeting (30%): 6/18/20
- Cost Estimate Review Meeting (30%): 6/18/20
- Pre-Final Office Review Submittal (Pre-FOR - 60%): 8/27/20
- Pre-Final Office Review Meeting (Pre-FOR - 60%): 9/10/20
- CM/GC Risk Management Meeting (60%): 9/24/20
- Cost Estimate Review Meeting (60%): 9/24/20
- Final Office Review Submittal (FOR – 90%): 11/30/20
- Final Office Review Meeting (FOR – 90%): 12/14/20
- CM/GC Risk Management Meeting (90%): 1/5/21
- Cost Estimate Review Meeting (90%): 1/5/21
- Final Construction PS&E (100%): 2/9/21
- If CAP not agreed upon, repackage PS&E for DBB 3/16/21-3/24/21

8. PUBLIC INVOLVEMENT

The Public Involvement (PI) consultant to prepare for and attend two public meetings.

- PI consultant will prepare a press release in the local paper
- PI consultant will prepare a CDOT website and administer a phone number and email for communication with the public
- PI consultant and prime shall attend meetings with Stakeholders
- PI consultant will compile a mailing list of people
- PI consultant and prime will prepare an advertisement. The PI consultant will mail the advertisement to the mailing list
- PI consultant will reserve a meeting location
- The public meeting will be open house format with a presentation
- Prime consultant will prepare up to five display boards
- Prime consultant will prepare and present a 5 to 10-minute presentation

9. FIELD SURVEY

The surveyor will perform the following tasks.

Research shall be done as per the CDOT Survey Manual.. The consultant shall provide a Field Survey as per CDOT Form 1217, including but not limited to:

- Attend Pre-Survey Conference.
- Obtain necessary right-of-entry (Permission to Enter Form) to permit work within the right-of-way. 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. The MHT shall be also submitted to the Project Manager.
- Provide traffic control per approved MHT for survey work.
- Complete a TMOSS (Topography Modeling Survey System) which encompasses the approaches of Structure F-13-S_Minor as needed for the realignment of WB I-70 and the median wall. New survey shall tie into to 2018 survey at the structure. Wetlands (however, not anticipated) will be marked by CDOT Environmental Staff and coordinated with the survey crew in the field on-site.
- Established Stamped Survey Control has been provided under the 2019 Feasibility Study and shall be used for new additional survey to tie the two surveys together.

- Locate Geotechnical borings. Additional borings may be required for the median wall on I-70, the surveyor shall survey all additional borings drilled under design.
- Obtain existing ROW Maps/Plans (provided by CDOT).

10. UTILITY COORDINATION

The Utility Coordinator will perform the following tasks:

Preliminary Design – Utility Coordination

- Location Maps – SUE provider will submit CO 811 SUE notification. If utility companies do not provide records in 10 days, Utility Coordinator will follow up with utility companies to request records, information on planned facilities, and inform them of the proposed project.
- Reviews and Investigations – Utility Coordinator will coordinate with design team, CM/GC contractor, and SUE provider to determine limits of geophysical investigations. After FIR meeting, Utility Coordinator will develop draft test hole plan with input from design team and CM/GC contractor. Utility Coordinator will review SUE provider's Quality Level (QL) B and QL A deliverables.
- Utilities to be protected in place or relocated if needed – Utility Coordinator will develop draft utility conflict matrix based on proposed design and SUE QL B deliverable.
- FIR – Utility Coordinator will develop FIR utility plans depicting existing utilities and preliminary utility conflicts. Utility Coordinator will attend FIR meeting and distribute FIR plans to utility owners for review and comment.

Final Design - Utility Coordination

- Utility Coordination Meetings – Utility Coordinator will meet/coordinate with affected utility owners to confirm timing and location of utilities to be protected in place or relocated.
- Utilities to be protected in place or relocated if needed – Utility Coordinator will revise utility conflict matrix based on utility coordination and project design, and will coordinate a plan with the design team, CDOT, and the CM/GC contractor to protect existing utilities in place or relocate if needed.
- FOR Utility Specifications and Agreements – Utility Coordinator will draft utility specifications and agreement letters for affected utility companies. CDOT will review draft utility agreements and submit to utility companies.
- FOR Plans – Utility Coordinator will develop FOR utility plans depicting existing, proposed design, revised utility conflicts, and recommended plan for protecting utilities in place or relocations. Relocations are not likely but may be needed. Utility Coordinator will attend FOR meeting and distribute FOR plans to utility owners for review and comment.

Final Design - Construction Plan Package

- PS&E Utility Specifications – Utility Coordinator will revise utility specifications.
- PS&E Utility Plans – Utility Coordinator will revise utility plans.

DELIVERABLES:

- FIR (30%) utility plans
- FOR (60% & 90%) utility plans and specifications
- Utility Conflict Matrix
- Utility Agreement/Notification Letters
- PS&E Stamped (Electronic) Utility plans and Specifications
- Utility records and meeting minutes from coordination meetings.

The consultant should note the following known utilities: CenturyLink underground fiber optic runs parallel south of EB I-70; Comcast underground fiber optic runs parallel north of WB I-70 (shared duct with CDOT); CDOT underground fiber optic runs parallel north of WB I-70 (shared duct with Comcast fiber optic), Xcel Energy underground electric runs parallel north of WB I-70. The consultant should note there is an unnamed roadside drainage on the north side of I-70 northeast of Structure F-13-S_Minor.

11. SUBSURFACE UTILITY ENGINEERING (SUE)

The SUE provider will perform the following tasks. Work will be performed in accordance with the American Society of Civil Engineers Construction Institute Standard 38-02 (ASCE/CI 38-02), as well as Colorado Senate Bill 18-16, and includes the following activities:

- SUE provider shall attend the pre-survey meeting.
- Obtain necessary right-of-entry (Permission to Enter Form) to permit work within the right-of-way. 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. The MHT shall be also submitted to the Project Manager.
- Provide traffic control per approved MHT for survey work.
- Prepare field books, log sheets, and crew scheduling and logistics for the initial utility designating field campaign.
- Identify existing utilities including ownership and type of facility in the project vicinity, the horizontal and vertical location of the utility with reference to the bridge structure and the contact information for that utility based on findings from the Subsurface Utility Engineering (SUE) investigation (described below) in conjunction with the Utility Coordinator.
- Survey utility potholes within the designated survey limits.
- All surveying of painted utility field designations shall be a sub-centimeter accuracy
- SUE consultant shall provide QL-C data on all overhead lines and QL-B on utility pole locations. The owner of each overhead utility shall be identified.

Phase 1: 2D Quality Level (QL) B data acquisition using electromagnetic (EM) induction, acoustic, and/or other geophysical technologies), characterization, and 2D depiction (CADD file) of existing utility infrastructure data to develop a reliably qualified base map and data set from which to develop and support future design, coordination, and construction decisions. Although Phase 1 utility designating of buried infrastructure will have goal of QL B (i.e., position is determined via a combination of geophysical, survey and engineering methods) some facilities such as non-conductive water is pragmatically designated to a mixture of QL C (i.e., based on surveyed surface features and record data), B, and A (i.e., exposed survey grade observations such as possible at manholes) during the Phase 1 field effort. Likewise, some non-conductive piping and/or ducts lacking tracer wire may be designated to QL D (i.e., based on evidence consisting of available record information and/or verbal accounts) during the Phase 1 effort. Data quality is improved as and where required during subsequent project utility engineering phases. Any utilities designated to QL C and/or QL D quality levels will be explained and described in the Phase 1 SUE existing utility report as to why a quality level below QL B has been used.

Phase 2: Vacuum Excavations will be taken at specific utility target locations to be determined by the project design team, CDOT, CM/GC contractor, and utility coordination staff. Populating utility data management system GEOfeature™ with hydraulic structure and test hole information from the field investigation. The Phase 2 investigation primarily consists of utility locating (discrete QL A vacuum excavated test holes). SUE provider and a vac truck contractor will perform excavation operations and the engineering survey of each test hole location. The test hole locations will need to be coordinated between SUE provider and project team based on identified utility conflicts and areas where more detailed data, including three dimensional coordinates, are required to complete designs and mitigate/accommodate conflicts. For the purpose of this work “locate” means to establish by engineering, surveying, drafting, and vacuum excavation practices the accurate horizontal and vertical position of subsurface utilities with vertical tolerances of generally 0.1 feet based on referenced benchmarks. Written logs for all test holes are utilized, derived elevations are transcribed onto CAD reference files, and “locate” points area mapped to Quality Level A on the plans.

12. ENVIRONMENTAL SUPPORT

- **Archaeology, Paleontology, Section 106 and 4(f):** by CDOT
- **Hazardous Materials:** by CDOT
- **Historic Resources and Paleontological:** by CDOT
- **Threatened and Endangered Species:** by CDOT

- **General Wildlife and Migratory Birds:** by CDOT
- **Riparian/Senate Bill 40 (SB 40):** by CDOT
- **Vegetation and Noxious Weeds:** by CDOT
- **Wetlands/Waters of the US:** by CDOT
- **Water Resources and Quality: Stormwater/Erosion Control Plans:** The consultant will develop the stormwater management plan based on CDOT's latest template. Assume over an acre of disturbance. Erosion control plans will be developed, and items will be estimated for initial, interim, and final stabilization.

13. ROADWAY DESIGN

The following work will be conducted by, or under the direct supervision of a Colorado licensed registered professional engineer. AASHTO methodologies, CDOT standards, CDOT's Access Code, the MUTCD, AASHTO's Roadside Design Guide, and CDOT's Region 3 Lane Closure Strategy will be used as design criteria and guidelines. CAD work will be completed in Microstation in accordance with CDOT's CADD Manual using the latest CDOT workspace. Design models will be prepared using Inroads.

I-70 through the project limits is a two-way divided highway through mountainous terrain with 60-mph posted speed. In the WB lanes, vehicles over 26,000 lbs gross weight are limited to 35-mph due to very steep downhill grades. At the structure, I-70 has three 12-foot lanes in each direction, totaling to 6-lanes for both directions. The shoulders on EB are 4-feet wide on the inside and 10-feet wide on the outside. The shoulders on WB are 4-feet wide on the inside and 8-feet wide on the outside. The median varies from 0-feet at locations with concrete barrier to 40-feet at the structure, and the elevation difference between EB and WB at the structure is roughly 10-feet. Guardrail is located on the outside shoulders on both EB and WB directions, a combination of concrete barrier and guardrail is located in the median.

The existing layout of the interstate intersection does not allow for CDOT snow plows traveling WB to safely access the structure. Realignment of I-70 WB can increase the WB outside shoulder width and reduce exiting speeds without interrupting traffic. Most importantly, realignment of I-70 WB is anticipated to be needed for construction phasing of the new structure.

Access points in the area include emergency pull out ramps and access to and from the existing structure. The sight distance for the WB exit to the structure is limited due to the horizontal alignment of I-70 and also the restricted outside shoulder width. Widening the shoulder would not only increase safety, but can provide construction phasing benefits.

A conceptual alignment of I-70 was developed to determine feasibility. A summary of recommended approaches for design are:

- The design speed of the WB exit shoulder should be designed based on the turning movement of a WB50.
- Determine the maximum allowable shift of I-70 WB to the south that will not impact I-70 EB alignment. Incorporate a wall to maximize the WB shift.
- The conceptual design assumed a superelevation of 8% based on the radius and design speed on as-builts. Additional survey is needed to determine exact superelevation and design requirements.
- Final design shall consider median wall limits and address impacts to the existing median drainage.
- An opening of 36-feet allows for two-way traffic in the new structure with minimal overlap for two head-to-head design vehicles.

Preliminary Roadway Design and Roadside Development: This work will develop the roadway design to an FIR level.

- Refine the horizontal and vertical alignment of I-70 and Forest Service Road.
- Complete CDOT Form 463. Identify design variances and complete CDOT Form 464 if necessary.

- Design the guardrail or concrete barriers as needed for the bridge approaches to protect any other roadside hazards.
- Develop the roadway design model in Inroads.
- Develop the intersection alignment and profile to ensure the roadway design is feasible.
- Develop cross sections for both I-70 and Forest Service Road.
- Develop a Preliminary Stormwater Management Plan.
- Develop preliminary specifications for the project.
- Constructability and maintenance of traffic shall be considered during the preliminary design phase to ensure the feasibility of the design.

Final Roadway Design and Roadside Development: This work will develop the roadway design to a final level.

- Address FIR comments.
- Finalize the guardrail and roadside design.
- Finalize the Inroads model.
- Finalize intersection details.
- The consultant will develop traffic control and phasing plans for maintenance of traffic during construction, two-lanes in each direction must be maintained throughout construction. This task will require coordination with CDOT and the CM/GC contractor.
- Develop tabulations for all items required for I-70 and Forest Service Road.
- Develop tabulations of traffic control items.
- Develop the final signing and striping plan and tabulations.
- Finalize the Stormwater Management Plan, including the SWMP Site Map and Tabulation of Stormwater Management Items.
- Revise the Form 463 as necessary.
- Finalize design details, typical sections, and plans.
- Finalize specifications for the project.

14. HYDROLOGY AND HYDRAULICS

Design efforts shall evaluate the 50-year criteria based on the unique setting of the new structure and the ramifications of an event greater than the 50-year event. The structure's elevation may warrant a design reoccurrence interval greater than the 50-year event.

The existing structure is a grade-separation structure used as a turn-around for emergency personnel, not as a drainage passage. However, the structure conveys flows during spring runoff when the adjacent storm water infrastructure is covered with snow and during severe rainfall event when the adjacent storm water infrastructure is at capacity or impacted by snow and/or debris. It should be noted that the existing structure roadway surface becomes icy during the winter months. Mitigating measures shall be considered during design.

Drainage for I-70 within the project limits shall be evaluated during design. The existing drainage system appears to have sufficient storage and capacity to handle the 50-year event when the system is properly maintained through removal of sediment buildup. Identification of the existing I-70 drainage system's connection depths and locations shall be completed during preliminary design. Construction of the median wall will impact the median drainage and will need to be addressed during design.

15. GOETECHNICAL

Final recommendations for the new structure were completed under the 2019 Feasibility Study and are acceptable for final design of the new structure. However, if the recommended median wall is pursued for design, the consultant shall complete a geotechnical investigation for the wall design.

The consultant will work with CDOT and the CM/GC contractor to conduct in-depth evaluations and analysis to identify and mitigate landslide risk for proposed construction. CDOT will provide the pavement design, R value for embankments and slope recommendations.

16. STRUCTURAL DESIGN

The designer will work with CDOT and the CM/GC contractor to determine structure selection and opportunities for ABC based on schedule, cost, and feasibility. The consultant will design the replacement structure, proposed median wall (if applicable), and proposed shoring as needed for phasing. The consultant will incorporate structural specifications and costs into the deliverables.

Conceptual structural alternatives were completed under the 2019 Feasibility Study. The new structure shall accommodate two-way traffic and account for head-to-head turning movement of a WB50. The clear span has been set to 36-feet which includes two 12-foot lanes, two 4-foot shoulders, and two 2-foot barriers. The vertical clearance of the new structure shall exceed 16.5-feet. Due to the location of the structure, the designer shall account for designing a buried structure under I-70 with a minimum of 4-feet of fill over the new structure to mitigate icing and differential frost heave of the pavement.

Due to short construction season, Accelerated Bridge Construction shall be anticipated by the designer. Under the Study, CDOT's Pre-scoping ABC Rating Worksheet was completed and resulted in a score of 88, making this project an excellent candidate for ABC techniques.

The consultant shall prepare a Structure Selection Report (SSR) for all major structures needed for design. It is anticipated that the consultant will prepare a SSR for both the new proposed bridge replacement structure and also the median wall (if applicable).

17. COST ESTIMATES

- **30% Preliminary (FIR) Cost Estimate:**
 - CDOT unit prices, supplemented by recent Region 3 bids, and adjusted for location will be used to estimate the costs for major known items (earthwork, roadway, walls, etc.).
 - Other unknown items (erosion control, traffic control, etc.) will be estimated by a percentage of the major items.
- **60% (Pre-FOR) Cost Estimate**
 - CDOT unit prices, supplemented by recent Region 3 bids, and adjusted for location will be used to estimate the costs for all items.
- **90% (FOR) Cost Estimate**
 - Revise the estimate at the FOR submittal
- **Final Cost Estimate**
 - Revise the estimate at the PS&E submittal

18. QUALITY CONTROL/QUALITY ASSURANCE

Perform quality assurance and cross disciplinary reviews for all related work. Quality control checking is included within the technical work tasks.

19. MAJOR DELIVERABLES

- **FIR (30%) level plans and cost estimate. FIR plan set will include the following sheets:**
 - Title sheet
 - Standard plans list
 - Typical sections
 - Preliminary Quantities
 - General Notes
 - Plan and profile sheets showing drainage layout, existing right-of-way and existing utilities
 - Preliminary intersection sheets
 - Bridge plans
 - Wall plans
 - Preliminary Stormwater Management Plan
 - Cross sections

- **Pre-FOR (60%) level plans, specifications, and cost estimate. Pre-FOR plan set will include the following sheets:**
 - Title sheet
 - Standard plans list
 - General Notes
 - Typical sections
 - Summary of Approximate Quantities
 - Tabulation Sheets
 - Survey control diagram
 - Removal plan sheets
 - Geometric Layout
 - Roadway plan and profile sheets. Include drainage callouts on roadway plans.
 - Intersection detail sheets
 - Grading plans
 - Culvert profiles and drainage details
 - Bridge Plans
 - Wall Plans
 - Shoring Plans
 - Stormwater Management Plan and SWMP Site Map
 - Wetland sheets (if applicable, CDOT will provide direction)
 - Traffic control plans and tabulation
 - Construction phasing plans and typical sections
 - Sign tabulation
 - Pavement marking tabulation
 - Final signing and striping plans
 - Utility Plans
 - Cross sections
 - Specifications

- **FOR (90%) level plans, specifications, and cost estimate. FOR plan set will include the following sheets:**
 - Title sheet
 - Standard plans list
 - General Notes
 - Typical sections
 - Summary of Approximate Quantities
 - Tabulation Sheets
 - Survey control diagram
 - Removal plan sheets
 - Geometric Layout
 - Roadway plan and profile sheets. Include drainage callouts on roadway plans.
 - Intersection detail sheets
 - Grading plans
 - Culvert profiles and drainage details
 - Bridge Plans
 - Wall Plans
 - Shoring Plans
 - Stormwater Management Plan and SWMP Site Map
 - Wetland sheets (if applicable, CDOT will provide direction)
 - Traffic control plans and tabulation
 - Construction phasing plans and typical sections
 - Form 859 Construction Schedule in Microsoft Project (coordinated with CDOT and the CM/GC contractor)
 - Sign tabulation

- Pavement marking tabulation
- Final signing and striping plans
- Utility Plans
- Cross sections
- Specifications
- **SUE Report**
- **Form 859 & Construction Schedule in Microsoft Project (coordinated with CDOT and the CM/GC contractor)**
- **Drainage Report**
- **MESA Report:** by CDOT
- **CDOT Hazardous Materials Form 881:** by CDOT
- **Environmental Documentation:** by CDOT
- **Environmental Permits:** Nationwide 404 Permit by CDOT (if required)

20. Construction Plan Package and final cost estimate

The construction contract package shall consist of the final 100% construction plans, specifications, and project special provisions. The consultant will completely describe the work required to build the project including project special provisions and detailed quantities. This project will be delivered via the CM/GC project delivery method. In the event a CAP is not agreed upon after the third attempt, the consultant shall assist CDOT in preparing Bid Package materials to advertise the project through Design-Bid-Build (DBB) and will also provide assistance during the Advertisement phase to respond to contractor questions and required revisions to the plan set. The consultant shall provide the following:

- Electronic copies of the following:
 - Roadway
 - *Horizontal and Vertical data*
 - *Earthwork quantities*
 - *Cross sections*
- Final engineering package. The consultant shall submit pdf copies of the following:
 - All project calculations or worksheets
 - All final reports and their approvals
 - Copies of variances, design decisions, and variance approvals
 - Project meeting minutes
 - Professional Engineer Stamped (Electronic) Record plans sets

Record plan sets for final design of roadways and structures will be produced which shall bear the electronic seal and signature of the responsible Consultant Engineer on each sheet. The set shall be retained by the Consultant for three (3) years. The electronic set shall be submitted to CDOT through ProjectWise Share Site provided by CDOT.

21. SERVICES AFTER DESIGN

Post design services shall be included under this scope. The consultant shall:

- Review shop drawings
- Respond to Request for Information (RFI's) as requested
- Provide revised contract documents for minor design revisions
- Conduct occasional site-visits
- Review submittals
- Review design calculations as needed for items designed by contractor's staff, items such as precast structures

22. PROJECT COSTS

The construction cost of this project is estimated at \$15 million

23. WORK DURATION

The time period for the work described in this scope is estimated to begin **January/February 2020**. Completion of work is dependent on construction duration. Construction completion is anticipated by either November 2021 or November 2022. The contract shall extend through March 31, 2023.

24. CONSULTANT RESPONSIBILITY AND DUTIES

After gaining Colorado Department of Transportation (CDOT) and Colorado Bridge Enterprise (BE) concurrence on the recommended action and NEPA approval, the Consultant is responsible for developing a complete (plans, specifications, and cost estimate) package of recommended improvements. The work will include (but not be limited to) the design of structural, roadway, traffic, hydraulics, geotechnical/geohazards, environmental, survey, and utility items.

25. WORK PRODUCT

The Consultant work products are:

- A. Project Coordination
- B. Meeting Minutes
- C. Schedules
- D. Field Survey
- E. Stakeholder Coordination and Public Outreach
- F. Hydraulic Drainage Report
- G. Structure Selection Report for New Bridge Structure and Wall
- H. Geotechnical Investigation Report for Wall
- I. Utility Coordination
- J. Subsurface Utility Engineering (SUE) Report
- K. Field Inspection Review (FIR) Plans and Estimates
- L. Pre-Final Office Review (Pre-FOR) Plans, Specifications, and Estimates
- M. Final Office Review (FOR) Plans, Specifications, and Estimates
- N. Construction Plan Package (100%)
- O. Advertisement/Bid Plans, Specifications, Cost Estimate (if applicable)
- P. Professional Engineer Stamped (Electronic) Record Sets
- Q. Professional Engineer Stamped (Electronic) Utility Plans

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

26. WORK PRODUCT COMPLETION

All submittals must be accepted by the CDOT Contract Administrator or designee.

27. ADDITIONAL PROJECT INFORMATION

Additional information regarding this project is included in the following documents:

- A. 2019 Feasibility Study Report for Structure F-13-S_Minor
- B. 1964 As-constructed I-70 and Structure F-13-S_Minor Plans
- C. 1969 As-constructed Structure F-13-S_Minor Extension Plans
- D. ROW plans for project limits

Electronic copies of these documents are available on CDOT's Google Drive at:

https://drive.google.com/open?id=1sro7vZ4b6Kab9g_7yhjPwYJ0D1olQfdI

SECTION 2

PROJECT MANAGEMENT AND COORDINATION

1. CDOT CONTACT

The Contract Administrator for this project is: Grant Anderson, Resident Engineer.
Active day-to-day administration of the contract will be delegated to the CDOT/PM:

Sarah Navarro
Professional Engineer I
1198 S. Adams Ave
Silverthorne, CO 80498
PO BOX 2236
Frisco, CO 80443
Office phone: 970-328-9936 (Eagle)
Office phone: 303-512-5605 (Silverthorne)

2. PROJECT COORDINATION

Direct Coordination will be completed by CDOT (with support from the consultant) with the following entities (list may not be all-inclusive):

- A. Colorado Bridge Enterprise (BE)
- B. United States Forest Service (USFS)
- C. Summit County
- D. Towns of Dillon and Silverthorne
- E. Federal Highway Administration (FHWA)
- F. Colorado Parks and Wildlife (CPW)
- G. US Fish and Wildlife Services (USFWS)
- H. Emergency Responders
- I. Utilities
- J. Traveling Public

SECTION 3 EXISTING FEATURES

- 1. STRUCTURES**
F-13-S_Minor (I-70 MP 211 over Forest Service Road)
(Additional minor structures and walls impacted)
- 2. UTILITIES**
CenturyLink, Comcast, Xcel Energy, CDOT
Contact Utility Notification Center of Colorado (U.N.C.C.) at 1-800-922-1987 or 811
- 3. IRRIGATION DITCHES**
No known ditches.
- 4. RAILROADS**
No known railroads
- 5. OTHER**

SECTION 4 GENERAL INFORMATION

- 1. NOTICE TO PROCEED**
Work shall not commence until the written Notice-to-Proceed is issued by CDOT. 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 the time lost for:
 - A. Reviews and Approvals
 - B. Response and Direction
- 2. PROJECT COORDINATION**
 - A. Routine Working Contact
Routine working contact shall be between the CDOT/PM and the Consultant Project Manager (C/PM)
 - B. Project Manager Requirements
Each Project Manager shall provide the others with the following:
 - a. A written synopsis or copy of their respective contacts by telephone and in person with others
 - b. Copies of pertinent written communications
- 3. ROUTINE REPORTING AND BILLING**
The Consultant shall provide the following on a routine basis:
 - A. Coordination:
Coordination of all contract activities by the C/PM
 - B. Periodic Reports and Billings:
The periodic reports and billings required by CDOT Procedural Directive 400.2 (Monitoring Consultant Contracts), including monthly drawdown schedules.
 - C. 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. PERSONNEL QUALIFICATIONS**
The C/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. Should the personnel change at some point during the contract, documentation shall be provided to qualify the replacement personnel.

BR – Bridge Design, BI – Bridge Inspection, CE – Civil Engineering, EN – Environmental Engineering, GE – Geotechnical Engineering, HD – Highway & Street Design, HY – Hydraulics, MA – Engineering Management (Contract Admin), MC – Engineering Management (Construction), MT Materials Testing, SO – Soils Engineering, SE – Structural Engineering, SU – Surveying, TP – Transportation Engineering, TR – Traffic Engineering.

5. CDOT COMPUTER/SOFTWARE INFORMATION

The consultant shall utilize the most recent CDOT adopted software. The primary software used by CDOT is as follows:

- | | | |
|----|-----------------------|---|
| A. | Earthwork | InRoads |
| B. | Drafting/CADD | InRoads and Microstation with CDOT's formatting configurations and standards. |
| C. | Survey/photogrammetry | CDOT TMOSS, InRoads, ESRI geo-referenced Shapefiles |
| D. | Structural Rating | AASHTOWare |
| E. | Estimating | Transport (an AASHTO sponsored software) as used by CDOT
And Microsoft Excel |
| F. | Specifications | Microsoft Word |
| G. | Scheduling | Microsoft Project |

6. COMPUTER DATA COMPATIBILITY

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. Refer to Section 8, Table 1 - Submittals, for additional information regarding current formats and the acceptable transmittal media.

7. PROJECT DESIGN DATA AND STANDARDS

- A. General:
Appendix A provides a comprehensive list of state and federal reference material. However, Appendix A does not contain local agency reference material which 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.
- B. Specific Design Criteria:
Appendix B is a list of specific design criteria. The list is comprehensive and may include items that are not required for tasks defined in this scope. The Consultant shall submit any proposed changes to the pertinent criteria to the CDOT/PM at one of the periodic progress meetings prior to initiating design.
- C. 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

PROJECT INITIATION AND CONTINUING REQUIREMENTS

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

***Other Agency Abbreviations:**

- 1) Summit County = SC

	CDOT (C)/ Other*	Consultant
1. PROJECT MEETINGS The types and numbers of meetings shall be flexible and determined by an interactive process as approved by the CDOT/PM. Public Hearing efforts are accounted for in Section 5.		
A. Initial Project Meeting - Schedule and facilitate initial project kick-off meeting. All appropriate disciplines should be included in the scoping meeting. Create an invitation list, send notices with a draft agenda prior to the meeting, and provide meeting minutes to all those invited. Whenever possible, the kick-off meeting will include an on-site inspection to familiarize the entire project team with the character and conditions of the area. The scoping meeting will also be used to clearly identify scope elements, responsibilities and coordination necessary to complete the work.	C	X
B. Progress Meetings – The Consultant team will meet periodically with CDOT and the CM/GC contractor as required (typically at two-week intervals). The meetings will review: activities required to be complete since the last meeting, problems encountered/anticipated and potential solutions, project schedule update, action items, and coordination required with other agencies.	C	X
C. Scoping, Preliminary Concepts, Structure Selection, FIR, Pre-FOR, and FOR milestone meetings – The Consultant shall facilitate the identified milestone meetings.	C	X
D. Public Meetings The Consultant shall provide the presentation aids, and help conduct the meeting.		X
i. Small Group Meetings (one-on-one) - Meet with property and business owners or others directly affected by the project work to identify likely impacts and discuss possible mitigation or resolutions.	SC, C	X
ii. General Public Meetings (information and workshops) - These meetings may be used to establish communications with the public, add to the “contact list”, and gather information regarding local concerns. The meetings may also take the form of a work session or workshop with the affected parties.	SC, C	X
iii. Public Review Meetings - These meetings are intended to disseminate project progress information to the public and representatives of local entities.	SC, C	X
E. Meeting Minutes Project meeting minutes shall be completed by the Consultant and provided to the CDOT/PM within one week of the actual meeting. When a definable task is discussed during a meeting, the minutes will identify the “Action Item”, the party responsible for accomplishing it, and the proposed completion date.		X
F. Contact List Establish and maintain a computerized list of all appropriate interested parties for the communication process.		X

	CDOT (C)/ Other*	Consultant
G. Public Notices/Advertisements Publicize the proposed project in accordance with the CDOT policies and procedures. Copies of the publication shall also be mailed to the individuals on the “contact list”.		X
H. Communication Aids		
i. Graphics Support – provide graphics for presentations and project documents. This may include slides, overhead projector slides, maps and plan views of conceptual design, computerized presentations and other displays for visual presentations at meetings.		X
ii. Newsletter – a newsletter which will contain project progress information and announcements will be published at the specified interval and will be distributed to those on the “contact list” specified by the CDOT/PM.		X
iii. Internet web pages – All external CDOT-related Web sites shall be hosted on CDOT’s server and developed in-house with assistance from the Web Team and the Office of Public Relations. The Consultant shall support CDOT staff by providing data for the website.	C	X
2. PROJECT MANAGEMENT Create and provide an approach for managing the project (i.e. involved staff, key team positions), including task orders, a schedule, document and agency reviews and other project needs.		X
3. DEVELOP A PROJECT SCHEDULE AND ASSIGN TASKS The Consultant is responsible for coordinating the required work schedule for project design. Prepare the initial detailed project schedule for review by the CDOT/PM, and refine to provide detail as requested. Modifications will be made as necessary in collaboration with CDOT and appropriate justification.	C	X
4. QUALITY ASSURANCE/QUALITY CONTROL (QA/QC) Prepare and submit a QA/QC plan as part of the planning documents noted above, and commit to adhering to the QA/QC process throughout the project.		X
5. OBTAIN NECESSARY RIGHT-OF-ENTRY AND PERMITS Some activities may require work on land not controlled by CDOT. In such cases the Consultant shall obtain the necessary written permission to enter the premises. Written permission shall be coordinated with other CDOT staff and consultants that may need right-of-entry such as geotechnical and survey personnel. Included in this written permission will be the names and telephone numbers of persons to contact should notification prior to entry be necessary.		X

**SECTION 6
ENVIRONMENTAL WORK TASK DESCRIPTIONS**

	CDOT (C)/ Other*	Consultant
1. WATER RESOURCES AND QUALITY Identify the water quality impacts and a plan to mitigate the impacts. The Mitigation plan shall include conclusions of effects, permanent best management practices (BMPs), temporary/construction BMPs, erosion control measures, and definition of maintenance responsibilities.		X
2. WETLANDS/WATERS OF THE US Project area should be surveyed for wetlands prior to construction. Coordination with SWEEP should occur during the NEPA process.	C	
3. VEGETATION AND NOXIOUS WEEDS An official survey for vegetation (including riparian) and noxious weeds prior to start of construction should be conducted. Project should adhere to and comply with CDOT policies regarding weed free topsoil and equipment, as well as reseeding techniques, timing, and noxious weed best management practices. All disturbed vegetation will be reseeded with an appropriate native seed mix approved by Summit County and the US Forest Service.	C	
4. HAZARDOUS MATERIALS An Initial Site Assessment (CDOT Form #881) should be performed during the NEPA process.	C	
5. ARCHAEOLOGICAL, PALEOTOLOGICAL, SECTION 106 AND 4F ASSESSMENT Research and potential field surveys should be conducted prior to construction to verify that no new listed sites are present. Project should adhere to and comply with CDOT Spec 107.23.	C	
6. HISTORIC RESOURCES AND SECTION 4(f) EVALUTATION (if required) CDOT's senior historian should be consulted to determine whether the structure is exempt from Section 106.	C	
7. THREATENED & ENDANGERED CANDIDATE AND CO STATE SENSATIVE SPECIES A current IPaC report should be obtained. Coordination with CPW, USFS, USFWS, ALIVE and SWEEP should occur during the NEPA Process. Concurrence of No Effects on TES species from USFWS should be obtained prior to construction.	C	
8. GENERAL WILDLIFE AND MIGRATORY BIRDS The official nesting season is April 1 - August 31. While no nests were observed on the structure, it will need to be surveyed and maintained free of nesting birds prior to and during construction. A qualified biologist will need to survey for and manage migratory birds or their nests. If an active nest (eggs or fledglings) are found on the structure, or within 50 feet, work will need to cease until all the young fully fledge (fly away on their own). Refer to ALIVE and SWEEP MOUs in the I-70 Mountain Corridor PEIS.	C	
9. RIPARIAN/SENATE BILL 40 (SB 40) Determine whether or not the unnamed drainage falls under SB40 jurisdiction and whether it can be cleared under the Programmatic SB40 Certification.	C	

**SECTION 7
PRECONSTRUCTION WORK TASK DESCRIPTIONS**

	CDOT (C)/ Other*	Consultant
1. PROJECT INITIATION AND CONTINUING REQUIREMENTS		
A. Environmental Mitigation and Requirements - Ensure that any mitigation commitments within the NEPA documentation are incorporated into the project design plans.	C	X
B. Identify Design Criteria- Submit a copy of Appendix B -Specific Design Criteria with the appropriate items completed.		X
C. Initiate Survey - Arrange Preliminary Field Survey and/or Aerial Survey. CDOT Form 1217a is an outline of a complete survey request and may be used as a guide for completing the survey plan.	C	X
D. Traffic Control - Consultant field activities that interfere with traffic operations within existing roadways will require control of traffic. The Consultant shall plan and provide any required traffic control for the survey, testing, or the design process. Traffic control operations will be in accordance with the MUTCD. The proposed Method for Handling Traffic (MHT) must be submitted to the CDOT/PM. Also, certification of the Traffic Control Supervisor as a Worksite Traffic Supervisor by the American Traffic Safety Services Association (ATSSA) or as a TCS (Traffic Control Supervisor) by the Colorado Contractors Association (CCA) shall be required.		X
E. Structure Review Meeting - While the major structural design work is progressing, the Consultant shall meet periodically with the CDOT Structure Reviewer and CM/GC contractor to review the work. These meetings may be in addition to, or in conjunction with, the Project Progress Meetings. The complexity of the structure shall be considered by the CDOT Structure Reviewer to determine the frequency of review meetings. Other required meetings are described in subsequent sections.		X
F. Initial Submittals - Submit the following samples to the CDOT/PM for approval:		X
i. An original plan sheet that complies with this scope of work.		X
Photogrammetric and/or survey data and a drawing or photograph in accordance with the requirements specified in this scope of work.		X
2. INFORMATION GATHERING		
A. Survey - Surveys will be conducted in accordance with the CDOT Survey Manual, the latest addendum thereof, and applicable state statutes. The completed survey shall be reviewed by the Region survey unit. Two weeks should be provided in the schedule to complete the review and sufficient time should be provided to address all comments provided by this review. Design shall not proceed until all comments resulting from this review have been satisfactorily addressed.		X
i. Presurvey Conference - A presurvey conference shall be held. The consultant shall attend the Presurvey conference prior to any survey work.		X
ii. Survey Data Research - Research shall be done as per current CDOT manuals		X
B. TMOSS (Topographic) Survey - Collect the data required to produce a planimetric map and submit in TMOSS format. Features located will include, but not be limited to signs, fences, drainage features, barriers, guardrail, curbs, and edges of pavements. Horizontal accuracy shall be as specified for a CDOT class C or D TMOSS survey.		X
C. Terrain (Relief or Elevation) Survey - Collect elevation data and submit in TMOSS format. Natural ground elevations shall be as specified.		X

	CDOT (C)/ Other*	Consultant
D. Hydraulic Survey - Locate culverts, storm sewer pipes, inlets, vaults, manholes and determine invert elevations. Locate inlets and determine invert elevation of pipes. Accomplish drainage situation surveys for designated culverts.		X
E. Survey Report - Prepare a Survey Report as required in the Survey Manual.		X
F. Accuracy Tests - Tests are to be performed on a regular basis throughout the project by the consultant.		X
G. Review by Professional Land Surveyor The accuracy tests are to be reviewed by the PLS in responsible charge for the project, and submitted to the project engineer and made part of the project records. Further review of all aspects of the field and office work shall also be the responsibility of the PLS in responsible charge.		X
3. STRUCTURE SELECTION		
A. Major Structure Design – Develop a Structure Selection report. Schedule and attend a structure selection meeting once the report is complete.		X
i. Structural Data Collection – obtain structure site data and data on existing structures including existing plans, structure ratings, inspection reports, foundation information and shop drawings. A field investigation of existing structures may be made with notification to the Resident Engineer.		X
ii. Structure Selection and Layout - Review the 2019 Feasibility Study Report to determine the requirements that will control the structure size, layout, type, and also shoring as needed for phasing. The evaluation shall include determination of the following: the structure layout alternatives, the structure type alternatives, the foundation alternatives, the preliminary quantities and cost estimates, median wall alternatives.		X
iii. Structure Selection Report - Prepare a structure selection report to document, and obtain approval for the structure preliminary design. A median wall is anticipated for design. If pursued for design, a structure selection report will also be completed for the wall. The report for the bridge structure and the wall structure may be combined in one document or may be separate documents.		X
4. PRELIMINARY DESIGN		
Materials Engineering		
i. Preliminary Soil Investigation and Report – coordinate with the CDOT /PM to determine test hole locations, and types of soils test to be completed.		X
B. Pavement - Include all below tests, investigations, analyses, and calculations performed as a result of this section.	C	
i. Pavement Rehabilitation – Evaluate any existing pavement to determine the equivalent Design Traffic (18k ESAL) that the existing pavement can carry, estimate the 18k ESAL’s experienced by the existing pavement, and obtain the projected 18k ESAL for rehabilitated pavement design period.	C	
ii. New Pavement Structure New pavement design shall be compatible with adjacent rehabilitated existing pavement.	C	
C. Structures - complete an investigation of the existing structure - Determine condition of existing structure as required.	C	X
D. Median Wall Geotechnical Investigation Report (if required)		X
i. Prepare a Geotechnical Investigation Request showing requested test hole locations.		X
ii. Formulate drilling pattern, perform the necessary subsurface investigation and collect samples as required.		X
iii. Perform the appropriate laboratory tests and analyze the data. Determine strength, allowable bearing capacity and corrosiveness of foundation material.		X

	CDOT (C)/ Other*	Consultant
iv. Perform lateral analyses (deformation, moment, and shear) for walls which are subjected to lateral loadings. This may be a computer analysis which will consider the group effect and selection of the soil parameters.		X
v. Submit the Geotechnical Investigation Report to the CDOT/PM for approval.		X
vi. Prepare engineering geology plan sheet and copies of the Wall Investigation Report with recommendations for type and size.		X
E. Hydrology/Hydraulic Engineering		X
i. Hydrology - Establish drainage basin data: delineate, determine size, waterway geometrics, vegetation cover, land use including performing a risk analysis.		X
ii. Hydraulics - Accomplish the preliminary design of minor drainage structures.		X
iii. Storm Water Management Plan- Initiate a Storm Water Management Plan in accordance with Municipal Separate Storm Sewer Systems (MS4) and CDOT Standards.		X
iv. Preliminary Hydraulics and Hydrology Report - including: Hydrology analysis, Minor structure hydraulic design, Appendix: Drainage basin maps, Hydrology/hydraulic worksheets.		X
F. Utility Coordination		X
i. Location Maps – SUE provider will submit CO 811 SUE notification. If utility companies do not provide records in 10 days, Utility Coordinator will follow up with utility companies to request records, information on planned facilities, and inform them of the proposed project.		X
ii. Reviews and Investigations – Utility Coordinator will coordinate with design team, CM/GC contractor, and SUE provider to determine limits of geophysical investigations. After FIR meeting, Utility Coordinator will develop draft test hole plan with input from design team and CM/GC contractor. Utility Coordinator will review SUE provider's Quality Level (QL) B and QL A deliverables.		X
iii. Utilities to be protected in place or relocated if needed – Utility Coordinator will develop draft utility conflict matrix based on proposed design and SUE QL B deliverable.		X
iv. FIR – Utility Coordinator will develop FIR utility plans depicting existing utilities and preliminary utility conflicts. Utility Coordinator will attend FIR meeting and distribute FIR plans to utility owners for review and comment.		X
G. Subsurface Utility Engineering- The SUE provider will perform the following tasks. Work will be performed in accordance with the American Society of Civil Engineers Construction Institute Standard 38-02 (ASCE/CI 38-02), as well as Colorado Senate Bill 18-16.		X
i. Survey - Surveys will be conducted in accordance with the CDOT Survey Manual, the latest addendum thereof, and applicable state statutes. The completed utility survey shall be reviewed by the Region survey and utilities unit. Two weeks should be provided in the schedule to complete the review and sufficient time should be provided to address all comments provided by this review. Design shall not proceed until all comments resulting from this review have been satisfactorily addressed.		X
ii. Prepare field books, log sheets, and crew scheduling and logistics for the initial utility designating field campaign.		X
iii. Phase 1: 2D Quality Level (QL) B data acquisition using electromagnetic (EM) induction, acoustic, and/or other geophysical technologies), characterization, and 2D depiction (CADD file) of existing utility infrastructure data to develop a reliably qualified base map and data set from which to develop and support future design, coordination, and construction decisions.		X
iv. Phase 2: Vacuum Excavations will be taken at specific utility target locations to be determined by the project design team, CDOT, CM/GC contractor, and utility coordination		

	CDOT (C)/ Other*	Consultant
staff. Populating utility data management system GEOfeature™ with hydraulic structure and test hole information from the field investigation.		
H. Roadway Design and Roadside Development- Coordinate all design activities with CDOT specialty units, CM/GC contractor, and other outside entities.		X
i. Input, check, and plot survey data. Verify that a project specific coordinate system approved by CDOT is used to identify the horizontal locations of key points.		X
ii. Input and check horizontal and vertical alignments against all design criteria. Necessary variances and/or design decisions will be identified with justification and concurrence by CDOT and BE.		X
iii. Provide alignments, toes of slope and pertinent design features, including permanent and temporary impacts, to the ROW, Utility, and Environmental Managers. a. Develop the intersection alignment and profile to ensure the roadway design is feasible. The roadway design model will be developed in Inroads. b. Develop cross-sections.		X
iv. Using current approved CDOT software, generate a 3 dimensional design model and produce preliminary quantities.		X
v. Roadside Development - For roadside items including but not limited to, guardrails, and delineators, provide the following: layouts in the plans.		X
I. Construction Phasing Plan - A construction phasing plan shall be developed for all projects which integrates the construction of all the project work elements into a practical and feasible sequence. This plan shall accommodate the existing traffic movements during construction (detours). A preliminary traffic control plan will also be developed which will be compatible with the phasing plan. This task will require coordination with CDOT and the CM/GC contractor.	C	X
J. Preparation for the FIR		X
i. Coordinate, complete, and compile the plan with input from CDOT and the CM/GC contractor.		X
ii. General layout of major structures (which has been accepted by CDOT)		X
iii. Preliminary cost estimate.		X
iv. The FIR plans shall comply with CDOT requirements and shall include: title sheet, typical sections, general notes, plan/profile sheets, and preliminary layouts. The plan/profile sheets will include the following: all existing topography, survey alignments, projected alignments, profile grades, ground line, existing ROW, rough structure notes (preliminary drainage design notes, including pipes, inlets, ditches and channels), and existing utility locations.		X
v. The preliminary construction phasing will be included in the FIR plan set.		X
K. Field Inspection Review		
vi. The FIR original plan sheets shall be revised/corrected in accordance with the FIR meeting comments within thirty (30) working days.		X
vii. Design decisions concerning questions raised by the FIR will be resolved in cooperation with the CDOT/PM. The C/PM shall document the decision and transmit the documentation to the CDOT/PM for approval.		X
viii. A list of all deviations from standard design criteria along with the written justification for each one shall be submitted to the CDOT/PM.		X
L. Post-FIR Revisions The Consultant shall complete the revisions required by the FIR before this phase of work is considered to be complete.		X

	CDOT (C)/ Other*	Consultant
5. FINAL DESIGN		
A. Project Review – update project schedule, coordinate activities, finalize design decisions, variances, and justification process.		X
B. Roadway Design and Roadside Development		
i. Roadway and roadside design. Prepare and provide final roadway design plans incorporating all input from applicable CDOT specialties, CM/GC contractor, and outside entities.		X
C. Prepare and provide wetland mitigation plan. (if applicable)	C	X
D. Utility Coordination - Following the finalization of the roadway horizontal alignment and profile grade and the horizontal and vertical location of drainage structures, sewers, and other underground structures, coordinate with the Utility Engineer and Utility Coordinator to identify and resolve any conflicts to finalize utility clearances.		X
E. Prepare and provide final utility plans per ASCE Subsurface Utility Engineering (SUE).		X
F. Hydraulic Design- Review data and information developed under the Preliminary Hydraulic Investigation and update in accordance with decisions made at the FIR.		X
G. Storm Water Management Plan- Update the Storm Water Management Plan in accordance with decisions made at the FIR and on additional investigation since the FIR.		X
H. Materials Engineering		
i. Finalize and provide the stabilization plan/pavement design report.	C	
ii. Finalize geotechnical considerations and incorporate them into the plans.	C	X
I. Traffic Engineering		
i. Prepare and provide permanent signing/pavement marking plans.		X
J. Final Major Structural Design - During the conduct of this activity the Consultant shall participate in structural review meetings with the CDOT Structural Reviewer.		X
i. Structure final design: Perform the structural analysis. Provide superstructure design, substructure design and document the design with design notes, details, and computer outputs. Hand calculated designs are also acceptable.		X
ii. Preparation of structure plans and specifications - Prepare and provide the Structural Plans and Specifications, including any revisions identified during the independent check.		X
iii. Prepare Independent design check, details, and quantity check.		X
iv. Prepare and provide the bridge rating and field packages.		X
K. Construction Phasing Plan- A final construction phasing plan will be developed in coordination with CDOT and the CM/GC contractor, which integrates the construction of all project work elements into a practical and feasible sequence. This plan shall accommodate the existing traffic movements during construction, and a final traffic control plan will be developed which shall be compatible with the phasing plan.	C	X
i. The consultant shall prepare Form 859 and construction schedule in Microsoft Project with production rates. The 859 schedule will be a coordination effort with CDOT and the CM/GC contractor.	C	X
L. Preparation of Permits (to be submitted by CDOT) This activity is concurrent with final design and must be completed prior to the CAP or advertisement for construction. Coordinate with the Region Environmental Manager and the CDOT/PM. Prepare application and design information for the following permits:		
i. 401 Permit Process (Water Quality Certification)	C	
ii. 402 Permit Process (Point Source Discharge)		
iii. 404 Permit Process (Individual Dredge and Fill)		
iv. Wildlife Certification	C	

	CDOT (C)/ Other*	Consultant
v. NPDES Storm Water Permit for Construction Activities	C	X
vi. SB40 Impacts	C	
M. Preparation for the Final Office Review		
i. Plans		X
ii. Specifications - This will consist of those unique Project Special Provisions which have to be written specifically for items, details, and procedures not adequately covered by CDOT's Standard Specifications and Standard Special Provisions. Also a list of the Standard Special Provisions which are applicable to the project shall be prepared. The Project Special Provisions shall be provided in the CDOT format and submitted with the project plans. Appropriate mitigation commitments made within any environmental documents should be included in the plans and specifications.		X
iii. Prepare FOR Estimate. Item numbers, descriptions, units and quantities shall be listed and submitted to the CDOT/PM.	C	X
N. Final Office Review - Submit the final revision of the plans after CDOT review.		X
O. Construction Plan Package The construction contract package shall consist of the revised FOR plans and will completely describe the work required to build the project including project special provisions and detailed quantities.		X
i. Electronic copies of the following: roadway horizontal and vertical data, staking data, earthwork quantities, and cross sections.		X
ii. Major structures - An independent set of the following shall be submitted to the CDOT Structural Reviewer for each major structure. <i>A Structure grades</i> <i>B Structure geometry</i> <i>C Structure Design (Final and Independent Design Check)</i> <i>E Structure Rating for Bridge Structure</i>		X
P. Final engineering package. The consultant shall submit copies in electronic PDF format.		X
i. All project calculations or worksheets		X
ii. All final reports and their approvals: Hydraulics, survey, SUE, SSR, geotechnical report (for wall), etc. All reports will have the latest revisions included.		X
iii. Copies of variances, design decisions, and variance approvals.		X
iv. Project meeting minutes.		X
v. Utility clearance package. Utility agreements and information regarding the utility location and clearance conditions.		X
vi. Maintain an environmental mitigation tracking tool for all environmental document commitments.	C	X
vii. Bridge construction packet Includes bridge grades, geometry, structural design, rating, and quantity calculations or worksheets.		X
viii. Any other information unique to this project and deemed important to the effectiveness of construction.		X
ix. Record plans sets Electronic record plan sets for final design of roadways and structures will be produced which shall bear the electronic seal and signature of the responsible Consultant Engineer on each sheet. The complete set shall be retained by the Consultant for three (3) years. The electronic set shall be submitted to CDOT. The original plan drawings shall not bear a seal.		X

**SECTION 8
SERVICES AFTER DESIGN**

	CDOT (C)/ Other*	Consultant
1. REVIEW OF SHOP DRAWINGS –Review contractor shop and auxiliary drawings as directed by the CDOT/PM by a licensed professional engineer acceptable to the CDOT/PM.		
A. Maintain a log of all submittals which includes the following information: submittal description, date received, date transmitted back to sender.		X
B. Review Shop Drawings - Review the construction contractor’s shop drawings for conformance and compliance with the contract documents, the provisions of the current “Standard Specifications for Road and Bridge Construction and with the time frames shown in the CDOT specifications in conjunction with the contract work.		X
2. TECHNICAL ASSISTANCE - Provide technical assistance to CDOT project personnel on an as-needed basis. This service shall include, but not be limited to, the following:		
A. Respond to questions in the field that arise relative to the plans, details or special provisions.		X
B. Provide engineering and drafting services for design revisions required due to changes in construction or field conditions.		X
C. Review structural erection plans.		X
3. REPORT SUBMITTAL - The following reports/submittals shall be maintained and submitted:		
A. Diary - A complete diary will be accomplished daily for each field observation activity.		X
B. Documentation/justification - Changes/revisions/documentation justifying changes and/or revisions to plans and specifications		X
C. Calculations, drawings, and specifications as needed.		X
D. Daily time sheets - This will be filled out daily on a form approved by the Project Engineer. This sheet will remain with the Project Engineer.		X
4. POST DESIGN PLAN MODIFICATIONS		
When requested by the Program Manager through the CDOT/PM, the Consultant shall provide design services for plan modifications required by unforeseen field conditions.		X
5. POST CONSTRUCTION SERVICES		
A. Final Earthwork or Interim Determination - Compute the final or interim as-built earthwork quantities. This will include the required surveying, engineering technician, and computer support.		X

SECTION 9
CONTRACT CONCLUSION (CHECKLIST)

1. SUPPLEMENTAL WORK

It is anticipated that this contract may be supplemented for:

- A. Preliminary Design
- B. Final Design
- C. Post Design

2. CONTRACT COMPLETION

This Contract will be satisfied upon acceptance of the following items if applicable:

- A. Project Progress Meeting Minutes
- B. Digital TMOSS Data
- C. Survey Report
- D. Completion of review of contract submittals
- E. Professional Engineer Stamped (Electronic) Design Plans, Specifications, and Final Estimate
- F. Traffic Control Plan(s)
- G. All Environmental Permits
- H. All environmental, Utility and ROW Clearances
- I. Structural Selection Report for Buried Bridge Structure and Wall
- J. Structural Rating for Major Bridge Structures
- K. Geotechnical Report for Wall
- L. Hydraulics Report for Drainage System/Elements
- M. Subsurface Utility Engineering (SUE) Report
- N. Environmental NEPA Documents
- O. Form 859 Construction Schedule in Microsoft Project (coordinated with CDOT and the CM/GC contractor)

APPENDIX A
TABLE 1 – SUBMITTALS

Note: CDOT will provide cloud-based ProjectWise Share Site for file sharing.

Electronic Copy		Work Tasks	CDOT (C)/ Other*	Consultant
PDF	Orig.			
	X	Periodic Reports		X
X		Billings		X
	X	Meeting Minutes		X
X	X	Project Schedule	C	X
	X	Completed Specific Design Criteria		X
X		Survey Plan		X
X		Approved MHT's		X
X		Traffic Control Supervisor Certification		X
X		Permissions to Enter		X
	X	Initial Submittal of TMOSS Compatible Data and ESRI geo-referenced Shapefiles		X
X	X	Initial Submittal of an Original Plan Sheet		X
		Project Development		
	X	Public Communication Contact List		X
		Route Location Survey		
X		Traffic Control Supervisor Certification		X
X		Approved MHT's		X
	X	Survey data in raw, unedited formats		X
	X	Pothole data including invert elevations		X
X		Drainage report		X
X		Topographic survey notes		X
X	X	Contour plan checked for errors		X
		Survey control diagram	C	
		Field books		X
	X	Electronic Survey Files		X
	X	Survey TMOSS Data		X
		Monument Records		
		Control & Monumentation Plan Sheets		
		Permits		
X		401 Permit	C	
		Dewatering / 402 Permit		
X		404 Permit	C	
X		SB 40 Permit	C	
X		Wildlife Certification	C	
X	X	CDPS Storm Water Permit	C	X
		Environmental Work Tasks		
X	X	Appropriate NEPA Document (CatEx, EA, EIS, FONSI or ROD)	C	

Electronic Copy		Work Tasks	CDOT (C)/ Other**	Consultant
PDF	Orig.			
X	X	Figures and Exhibits from NEPA Document	C	
X	X	Air Quality Technical Report		
X	X	Geologic Technical Report		X
X	X	Water Quality Technical Report	C	
X	X	Wetland Finding Report and ESRI geo-referenced Shapefiles	C	
X	X	Integrated Noxious Weed Management Plan	C	
X	X	Biological Resources Report	C	
X	X	Biological Assessment	C	
X	X	Historic Resource Technical Reports	C	
X	X	Section 4(f) Documents	C	
X	X	Paleontological Technical Report	C	
		Environmental Justice Technical Report		
		Transportation Technical Report		
		Noise Technical Report		
X	X	Hazardous Materials Documentation (ISA/MESA)	C	
		Preliminary Design		
	X	Electronic Survey Data		X
X		Traffic Data & Recommendations		X
X		Geology & Soils Investigation Report	C	X
X		Pavement Design Report	C	
X		Existing Bridge Condition Report	C	
X		Foundation Investigation Report	C	
X		Engineering Geology Plan Sheet(s)		X
X		Preliminary Hydraulics & Hydrology Report		X
X	X	Preliminary Storm Water Management Plan		X
X		Utility Relocation Recommendations		X
X	X	Drainage Structure Plans		X
		Right-of-way		
		Memorandum of Ownership		
		Preliminary Ownership Map (include in FIR Plan set)		
X		Structural Selection Report		X
X		Foundation Investigation Request	C	X
X		Final Materials Recommendations	C	
X		Final Pavement Selection Report	C	
X		Traffic Report	C	
X		Preliminary Cost Estimate	C	X
X	X	FIR Plan Set		X
X		List of deviations from Standard Design Criteria		X
X	X	Corrected FIR Plan Set		X
		Final Design		
		ROW Authorization Plans		
X	X	Final Utility Plan Set		X
X		Final Geotechnical Report		X
X		Correspondence with Agencies, Entities, and Public		X
		Right-of-way		
		Area Calculations		

Electronic Copy		Work Tasks	CDOT (C)/ Other*	Consultant
PDF	Orig.			
		Authorization Plans		
		Legal Descriptions		
		Final Right-of-way Ownership Map		
X	X	Stabilization Plans		X
		Traffic Engineering		
X		Safety Assessment	C	
X	X	Signing/Pavement Marking Plans		X
X	X	Traffic Control Plan		X
		Roadside Planning		
X	X	Landscape Plan & Specifications		X
X		Certification of Plant Availability		X
X	X	Irrigation Plans & Specifications		X
X	X	Structure Final Review Plans & Specifications		X
X	X	Construction Phasing Plan		X
X	X	Storm Water Management Plan		X
X		FOR Plans & Specifications		X
X	X	FOR Cost Estimate		X
X	X	Final Review Revisions		X
		Construction Plan Package		
X	X	Final Plans (11X17), Specifications & Estimate Package for Construction		X
X	X	Final Cross Sections		X
X		Schedule of Quantities		X
X		Design Decisions		X
X		Variances		X
X		Findings In the Public Interest		X
	X	Original Surface Digital Terrain		X
	X	Final Surface Digital Terrain Model		X
	X	Design Digital Terrain Model		X
	X	Staking Data		X
X	X	Earthwork Quantities		X
X	X	Mass/Haul diagram		X
X		Project Calculations (2 copies)		X
X		Worksheets (2 copies)		X
X		Design Notes		X
X		Independent Design Review Reports		X
X		Roadway Design Data Submittal		X
X		Major Structure Design Final Submittal		X
X		Bridge Construction Package		X
X	X	Record Plan Sets		X

APPENDIX B REFERENCES

- 1 **AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO) PUBLICATIONS** (using latest approved versions):
 - A. A Policy on Design Standards-Interstate System
 - B. AASHTO LRFD Bridge Specifications
 - C. A Policy on Geometric Design of Highways and Streets
 - D. Guide for Design of Pavement Structures
 - E. Standard Specifications for Highway Bridges
 - F. Guide for the Design of High Occupancy Vehicle and Public Transfer Facilities
 - G. Guide for the Development of Bicycle Facilities
 - H. Standard Specifications for Transportation Materials and Methods of Sampling and Testing – Part I, Specifications and Part II, Tests
 - I. Highway Design and Operational Practices Related to Highway Safety
 - J. Roadside Design Guide
 - K. Load Resistance Factor Design (LRFD) Specifications

- 2 **COLORADO DEPARTMENT OF TRANSPORTATION PUBLICATIONS** (using latest approved versions):
 - A. Design Guide (all volumes)
 - B. Bridge Design Guide
 - C. Bridge Detailing Manual
 - D. Bridge Rating Manual
 - E. Project Development Manual
 - F. Erosion Control and Stormwater Quality Guide
 - G. Field Log of Structures
 - H. Cost Data Book
 - I. Drainage Design Manual
 - J. NEPA Manual
 - K. Environmental Stewardship Guide
 - L. Quality Manual
 - M. Survey Manual
 - N. Field Materials Manual
 - O. Standard Plans, M & S Standards
 - P. Standard Specifications for Road and Bridge Construction and Supplemental Specifications
 - Q. Item Description and Abbreviations (with code number) compiled by Engineering Estimates and Market Analysis Unit (“Item Book”)
 - R. Right-of-Way Manual
 - S. The State Highway Access Code
 - T. Utility Manual
 - U. TMOSS Generic Format
 - V. Field TMOSS Topography Coding
 - W. Topography Modeling Survey System User Manual
 - X. Interactive Graphics System Symbol Table

- 3 **CDOT PROCEDURAL DIRECTIVES** (This list is not all inclusive and may be amended, as appropriate, to reflect use of latest applicable and approved versions):
 - A. No. 27.1 Social Marketing – Use of Web 2.0 and Similar Applications

- B. No. 31.1 Web Site Development
- C. No. 400.2 Monitoring Consultant Contracts
- D. No. 500.1 Plans, Specifications and Estimates (PS&E) and Authorization to Advertise for Bids under Certifications Acceptance (CA)
- E. No. 500.5 Local Entity/State Contracts and Local Entity/Consultant Contracts and Local Entity/R.R. Contracts under CA
- F. No. 501.2 Cooperative Storm Drainage System
- G. No. 1601.1 Interchange Approval Process
- H. No. 1900.0 PO Noise Mitigation Policy

4 **FEDERAL PUBLICATIONS** (using latest approved versions):

- A. Manual on Uniform Traffic Control Devices
- B. Highway Capacity Manual
- C. Urban Transportation Operations Training – Design of Urban Streets, Student Workbook
- D. Reference Guide Outline – Specifications for Aerial Surveys and Mapping by Photogrammetric Methods for Highways
- E. Executive Order 12898
- F. FHWA Federal-Aid Policy Guide
- G. Technical Advisory T6640.8A
- H. U.S. Department of Transportation Order 5610.1E
- I. Geometric Geodetic Accuracy Standards and Specifications for Using GPS Relative Positioning Techniques
- J. ADAAG Americans with Disabilities Act Accessibility Guidelines
- K. 23 CFR 771, the FHWA Technical Advisory T6640.8A
- L. United States Army Corps of Engineers (USACE) Wetland Delineation Manual with the Arid West and Western Mountains Colorado Supplements.

5 **AREA:**

- A. Any appropriate local agencies references as appropriate

APPENDIX C SPECIFIC DESIGN CRITERIA

Note: The following criteria will be developed by the consultant and coordinated with the CDOT/PM prior to starting the design. The Consultant shall develop the CDOT Form 463 and insert a copy upon completion.

1. ROADWAY

A. BASIC DESIGN

The basis for design will be the data in CDOT Form 463, Design Data. A copy of the latest applicable design Data form will be furnished to the consultant.

B. GEOMETRIC AND STRUCTURE STANDARDS:

- a Design Speed, horizontal alignment, curvature, vertical alignment, sight distance and superelevation is specified in Form 463.
- b Use of Spirals –
- c Passing Sight Distance -
- d Decision Sight Distance -
- e Frontage Roads, Separation Width -
- f CDOT Access Code -
- g Airway – Highway Clearances Design Guide -
- h Bridges and Grade Separation Structures, Clearances to Structures and Obstructions, CDOT Design Guide -
- i Curb and Gutters, Type -

C. GEOMETRIC CROSS SECTION are as specified in Form 463

D. INTERSECTIONS AT GRADE:

- a Type -
- b Special Considerations –

E. TRAFFIC INTERCHANGES:

- a Type –
- b Ramp Type –
- c Special Considerations –

F. DESIGN OF PAVEMENT STRUCTURE:

- a Pavement Type & Percent Trucks are as specified in Form 463-
- b Economic Analysis Period –
- c Design Life –

G. MISCELLANEOUS DESIGN CONSIDERATIONS:

- a Fence Type -
- b FEMA Category –
- c Design Flood Frequency -

H. ROADSIDE DEVELOPMENT

- a Landscaping -
- b Specifications for Revegetating Disturbed Areas to be provided by CDOT
- c Noise Control -
- d Type -
- e Guardrail and End Treatments -

I. LIGHTING:

- a Type -

APPENDIX D 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.

1	AASHTO-	American Association of State Highway & Transportation Officials
2	ADT-	Average two-way 24-hour Traffic in Number of Vehicles
3	AREA-	American Railway Engineering Association
4	ATSSA-	American Traffic Safety Services Association
5	AT&SF-	Atchison, Topeka & Santa Fe Railway Company
6	ADAAG-	Americans with Disabilities Accessibility Act Guidelines
7	BAMS-	Bid Analysis and Management Systems
8	BLM-	Bureau of Land Management
9	BNRR-	Burlington Northern Railroad
10	CA-	Contract Administrator. The CDOT Manager responsible for the satisfactory completion of the contract by the consultant.
11	CAP-	CDOT's Action Plan
12	CatEx	Categorical Exclusion
13	CBC-	Concrete Box Culvert
14	CDOT-	Colorado Department of Transportation
15	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)
16	CDOT/STR-	Colorado Department of Transportation Structure Reviewer – The CDOT Engineer responsible for reviewing and coordinating major structural design
17	CDPHE-	Colorado Department of Public Health and Environment
18	CEQ-	Council on Environmental Quality
19	CM/GC	Construction Manager/General Contractor
20	COG-	Council of Governments
21	COGO-	Coordinate Geometry Output
22	CONSULTANT-	Consultant for this project
23	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).
24	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.
25	DEIS-	Draft Environmental Impact Statement
26	DHV-	Future Design Hourly Volume (two-way unless specified otherwise)
27	DRCOG-	Denver Regional Council of Governments
28	D&RGW-	Denver & Rio Grande Western Railroad
29	EA-	Environmental Assessment
30	EIS-	Environmental Impact Statement
31	ESAL-	Equivalent Single Axle Load
32	ESE-	Economic, Social and Environmental
33	FEIS-	Final Environmental Impact Statement
34	FEMA-	Federal Emergency Management Agency
35	FHPG-	Federal Aid Highway Policy Guide
36	FHWA-	Federal Highway Administration
37	FIPI-	Finding in Public Interest

38	FIR-	Field Inspection Review
39	FONSI-	Finding of No Significant Impact
40	FOR-	Final Office Review
41	GPS-	Global Positioning System
42	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.
43	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).
44	MS4-	Municipal Separate Storm Sewer System
45	NEPA-	National Environmental Policy Act
46	NGS-	National Geodetic Survey
47	NICET-	National Institute for Certification in Technology
48	NOAA-	National Oceanic and Atmospheric Administration
49	PAPER SIZES-	See Computer-Aided Drafting Manual (CDOT); Table 6-13 and Table 8-1
50	PE-	Professional Engineer registered in Colorado
51	PEIS	I-70 Mountain Corridor Programmatic Environmental Impact Statement
52	PM-	Program Manager
53	PLS-	Professional Land Surveyor registered in Colorado
54	PRT-	Project Review Team
55	PS&E-	Plans, Specifications and Estimate
56	PROJECT-	The work defined by this scope
57	ROR-	Region Office Review
58	ROW-	Right-of-Way: A general term denoting land, property, or interest therein, usually in a strip acquired for or devoted to a highway
59	ROWPR-	Right-of-Way Plan Review
60	RTD-	Regional Transportation Director
61	T/E-	Threatened and/or Endangered Species
62	SH-	State Highway Numbers
63	TMOSS-	Terrain Modeling Survey System
64	TOPOGRAPHY-	In the context of CDOT plans, topography normally refers to existing cultural or man-made details.
65	UDFCD-	Urban Drainage and Flood Control District
66	USACE-	United States Army Corp of Engineers