SCOPE OF WORK
I-25 Reconstruction Design
SH 66 to N/O SH 56

CONTRACT TYPE

Specific Rate of Pay	☐
Cost Plus Fixed Fee	☒
Other	☐

CONTRACT DATE: _____

PROJECT NUMBER: IM 0253-220

PROJECT LOCATION: I-25: SH 66 to N/O SH 56

PROJECT CODE: 18319

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

SECTION 1	PROJECT SPECIFIC INFORMATION
SECTION 2	PROJECT MANAGEMENT AND COORDINATION
SECTION 3	EXISTING FEATURES
SECTION 4	GENERAL INFORMATION
SECTION 5	PROJECT INITIATION AND CONTINUING REQUIREMENTS
SECTION 6	ENVIRONMENTAL WORK TASK DESCRIPTIONS
SECTION 7	PRECONSTRUCTION WORK TASK DESCRIPTIONS
SECTION 8	SERVICES AFTER DESIGN
SECTION 9	CONTRACT CONCLUSION (CHECKLIST)
APPENDICES	

Comments regarding this scope may be directed to:

Colorado Department of Transportation Boulder Residency

James Flohr, Resident Engineer
Chris Boespflug, Project Engineer
303-546-5650
James.Flohr@dot.state.co.us
Chris.Boespflug@dot.state.co.us

TABLE OF CONTENTS

		Page
INSTRUCTIONS		**1**
SECTION 1	**PROJECT SPECIFIC INFORMATION**	**2**
SECTION 2	**PROJECT MANAGEMENT AND COORDINATION**	**5**
SECTION 3	**EXISTING FEATURES**	**6**
SECTION 4	**GENERAL INFORMATION**	**7**
SECTION 5	**PROJECT INITIATION AND CONTINUING REQUIREMENTS**	**9**
1.	PROJECT MEETINGS	9
2.	PROJECT MANAGEMENT	111
3.	DEVELOP A PROJECT SCHEDULE AND ASSIGN TASKS	111
4.	QUALITY ASSURANCE/QUALITY CONTROL (QA/QC)	111
5.	VALUE ENGINEERING (VE) STUDY	111
6.	OBTAIN NECESSARY RIGHT-OF-ENTRY AND PERMITS	122
SECTION 6	**ENVIRONMENTAL WORK TASK DESCRIPTIONS**	**133**
1.	CONSULTANT DISCLOSURE STATEMENT	133
2.	PROJECT INITIATION	133
3.	ENVIRONMENTAL ANALYSIS AND DOCUMENTATION	155
4.	COST ESTIMATES AND FINANCIAL ANALYSIS	166
5.	DATA COLLECTION, FIELD INVESTIGATION, MITIGATION MEASURES	166
6.	DELIVERABLES	277
7.	PUBLIC AND AGENCY INVOLVEMENT	277
8.	NEPA DOCUMENTATION PROCESS	287
SECTION 7	**PRECONSTRUCTION WORK TASK DESCRIPTIONS**	**321**
1.	PROJECT INITIATION AND CONTINUING REQUIREMENTS	321
2.	PROJECT DEVELOPMENT	332
3.	PRELIMINARY DESIGN	354
4.	FINAL DESIGN	43
5.	CORRIDOR MANAGEMENT SUPPORT	49
SECTION 8	**SERVICES AFTER DESIGN**	**521**
1.	REVIEW OF SHOP DRAWINGS	521
2.	CONSTRUCTION SERVICES	521
3.	POST DESIGN PLAN MODIFICATIONS	532
4.	POST CONSTRUCTION SERVICES	532
SECTION 9	**CONTRACT CONCLUSION (CHECKLIST)**	**543**

APPENDICES/TABLES

TABLE ONE SUBMITTALS
APPENDIX A REFERENCES
APPENDIX B SPECIFIC DESIGN CRITERIA
APPENDIX C DEFINITIONS

INSTRUCTIONS

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

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

SECTION 1
PROJECT SPECIFIC INFORMATION

1. PROJECT BACKGROUND

This contract will be for the design of the I-25 corridor reconstruction from M.P. 243.40 to M.P. 251.10. This design will follow the North I-25 EIS Record of Decision (ROD-Phase I), which is anticipated to be completed by October 2011. Statements of Interests (SOI) should be based on the Draft North I-25 Environmental Impact Statement (DEIS) which is currently posted on the CDOT web site. Final design work will not begin until the ROD is signed. This contract will include all possible design disciplines potentially needed as this design project progresses. The Department may elect to perform portions of the design in-house. Design work for this section of the corridor shall be completed under this contract; however, CDOT anticipates the corridor may be divided into smaller projects for design and construction, as determined by the design team and available funding. The successful Consultant will need to be well versed in innovative contracting methods and help to determine the most beneficial delivery method for each project.

The environmental and NEPA work in this SOW is only anticipated to be needed if the design activities result in new impacts that were not identified in the North I-25 FEIS or if there are new circumstances (such as the designation of a new endangered species) that would result in new impacts.

2. PROJECT GOALS

This project intends to produce the following improvements:

A. Increased capacity ☒
B. Improved Safety ☒
C. Higher level-of-service ☒
D. Improved riding surface (smoother or stronger pavement) ☒
E. Bridge/Interchange Design ☒
F. Resurfacing, Restoration, Rehabilitation ☒
G. Reconstruction ☒

3. PROJECT LIMITS

This project is located on I-25, between milepost 243.40 to milepost 251.10 in Weld County.

4. PROJECT COSTS

The construction cost of this project is estimated at $127 Million.

5. WORK DURATION

The duration for the work described in this scope is estimated to begin October 2011 and end December 2021.

6. CONSULTANT RESPONSIBILITY AND DUTIES

The Consultant is responsible for:

- Project Management,
- Data Collection,

- Project Coordination,
- Preliminary/Final Design,
- Right of Way/Survey
- Services after design
- All other efforts and deliverables as indicated in this contract

All work shall be in conformance with the North I-25 Final EIS documents.

7. WORK PRODUCT

The Consultant work products are

A.	Reports	☒
B.	Environmental Documents	☒
C.	Field Inspection Review (FIR) Plans and Estimates	☒
D.	Final Office Review (FOR) Plans, Specifications, and Estimates	☒
E.	Advertisement/Bid Plans, Specifications, Cost Estimate	☒
F.	Construction Plan Package	☒
G.	Project Coordination	☒
H.	Schedules	☒
I.	Meeting Minutes	☒
J.	Professional Engineer Stamped Record Sets	☒
K.	Interchange Approval Process	☒
L.	Survey	☒
M.	Right Of Way Plans and Acquisition	☒
N.	Hydrologic/Hydraulic Floodplain analysis	☒

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

8. WORK PRODUCT COMPLETION

The CDOT Contract Administrator or designee must accept all submittals.

9. ADDITIONAL PROJECT INFORMATION

Additional information regarding this project is included in the following documents

A. Original aerial photogrammetric mapping
B. Original topographic survey
C. Original existing two-foot contour database
D. Right-of-way CADD file and property ownership GIS data
E. Microstation existing surface model
F. GIS data base of environmental resources
G. North I-25 EIS design criteria for I-25 mainline & ramps
H. North I-25 EIS design criteria for frontage roads and cross roads
I. Horizontal alignment control geometry – I-25 mainline & ramps

J. Horizontal alignment control geometry – frontage roads
K. Horizontal alignment control geometry – crossroads
L. Roadway plan – I-25 mainline & ramps/frontage roads/crossroads (FHU, 2011)
M. Concept plan – water quality ponds (FHU, 2011)
N. Concept plan – bridges/box culverts/retaining walls
O. Vertical profile – I-25 mainline & ramps
P. Vertical geometry – frontage roads
Q. Vertical geometry – crossroads
R. Typical section templates – I-25 mainline & ramps
S. Typical section templates – frontage roads
T. Typical section templates – crossroads
U. Microstation proposed surface model
V. CADD drawing – Microstation proposed surface modeling impact lines
W. PDF files – EIS appendix concept plans
X. PDF files – EIS concept plans
Y. PDF files – North I-25 EIS Volumes 1, 2, appendices and technical reports
Z. As-Constructed Plans (limited)

All documents are available on the CDOT website:
www.coloradodot.info/projects/NorthI-25Widening

As-constructed plans are available on a DVD by contacting Veronica Nicholson at the Loveland Residency at 970-622-1240.

SECTION 2
PROJECT MANAGEMENT AND COORDINATION

1. CDOT CONTACT

The Contract Administrator for this project is Johnny Olson, Region 4 Transportation Director.

Active day-to-day administration of the contract will be delegated to the CDOT/PM:

A. Name: Chris Boespflug
B. Title: Professional Engineer I
C. Address: 1050 Lee Hill Rd., Boulder, CO 80302
D. Office phone: 303-546-5676
E. Cell phone: 303-817-4668
F. Fax: 303-444-0751

2. PROJECT COORDINATION

Coordination will be required with the following

A.	Cities	☒
B.	Counties	☒
C.	Railroads	☒
D.	Regional Transportation District (RTD)	☒
E.	Denver Regional Council of Governments (DRCOG)	☒
F.	Metropolitan Planning Organizations (MPO's)	☒
G.	U.S. Army Corps of Engineers (USACE)	☒
H.	Urban Drainage & Flood Control District (UD & FCD)	☒
I.	Federal Emergency Management Agency (FEMA)	☒
J.	Colorado Division of Wildlife (CDOW)	☒
K.	U.S. Forest Service (USFS)	☐
L.	Environmental Protection Agency (EPA)	☒
M.	U.S. Fish and Wildlife Service (USFWS)	☒
N.	Federal Highway Administration (FHWA)	☒
O.	Federal Transit Authority (FTA)	☒
P.	Utilities	☒
Q.	Colorado Department of Public Health and Environment (CDPHE)	☒
R.	Other	☒

The consultant should anticipate that a design which affects another agency will have to be accepted by that agency prior to its acceptance by CDOT. Submittals to affected agencies shall be coordinated with CDOT.

SECTION 3
EXISTING FEATURES

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

1. STRUCTURES

Reference CDOT Field Log of Structures.

2. UTILITIES

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

3. IRRIGATION DITCHES

Highland Ditch and others as required.

4. RAILROADS

Great Western Railroad and others as required.

5. OTHER

As required.

SECTION 4
GENERAL INFORMATION

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 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) as defined in Appendix C.

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.
AC – Acoustical engineering, AR – Architecture, BR – Bridge Design, BI – Bridge Inspection, CE – Civil Engineering, EL – Electrical Engineering, EN – Environmental Engineering, GE – Geotechnical Engineering, HD – Highway & Street Design, HY – Hydraulics, ITS – Intelligent Transportation Systems, LA – Landscape Architecture, MA – Management (Contract Admin), ME – Mechanical Engineering, 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
D.	Bridge	CDOT Staff Bridge software shall be used in either design or design check
E.	Estimating	Transport (an AASHTO sponsored software) as used by CDOT
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 – None at time of contract. Others may be added as necessary based on work rquirements.**

	CDOT (C)/ Other*	Consultant	Not Applicable
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.	C	X	
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 CDOT and Consultant team will meet periodically 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. **Public Meetings** The Consultant shall provide the presentation aids, and help conduct the meeting.	C	X	
a 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.	C	X	
b General Public Meetings (information and workshops) The format of these meetings will be dictated by the project and goals for the meetings. 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.	C	X	
c Public Review Meetings These meetings are intended to disseminate project progress information to the public and representatives of local entities. Notices will be mailed at least 14 days in advance of these meetings to those on the "contact list".	C	X	

	CDOT (C)/ Other*	Consultant	Not Applicable
D. **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	
E. **Contact List** Establish and maintain a computerized list of all appropriate interested parties for the communication process.		X	
a The information on the list shall include as a minimum: i Name ii Firm (if any) iii Mailing/E-mail address iv Phone/Fax number		X	
b The contacts will be compiled from the list below, as supplemented by the Project Team and the attendees at public meetings: i Public Agencies ii Elected/Appointed Officials iii Neighborhood Groups iv Property Owners/Tenants v Business Interests vi Special Interests vii Railroads viii Media Contacts		X	
F. **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".	C	X	
G. **Communication Aids**			
a 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.	C	X	
b 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.	C	X	
c Local Office – Obtain and maintain an office within the project area to conduct small group meetings and provide displays/information to the public.			X
d 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 use of all Web 2.0 and similar social marketing applications on behalf of CDOT (including all regions, divisions and offices) is strictly prohibited unless authorized by the Director of the Office of Public Relations. No CDOT employee, contractor or consultant working for CDOT will post material on behalf of the agency on such applications without expressed written consent of the Director of the Office of Public Relations.	C	X	

	CDOT (C)/ Other*	Consultant	Not Applicable
2. PROJECT MANAGEMENT At the kick-off meeting, or shortly thereafter, 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. Should the overall project budget be $500 million or more, an official Project Management Plan (PMP) shall be prepared in accordance with the Safe, Accountable, Flexible, Efficient, Transportation Equity Act (SAFETEA-LU) requirements (or newer authorization guidance as applicable). The Consultant shall coordinate all the work tasks being accomplished by all parties to ensure project work completion stages are on schedule.	C	X	
3. DEVELOP A PROJECT SCHEDULE AND ASSIGN TASKS The Consultant is responsible for coordinating the required work schedule for tasks accomplished by CDOT and other agencies. Prepare the initial project schedule for review by the CDOT/PM and consultant team, and refine to provide detail as requested. Modifications will be made as necessary in collaboration with CDOT and appropriate justification. The tasks covered by this Scope of Work are expected to take approximately **24 years** to complete.	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.	C	X	
5. VALUE ENGINEERING (VE) STUDY A team of transportation design and construction experts will perform a Value Engineering (VE) study. The VE study will be conducted early enough in the project development process to allow evaluation and incorporation of VE recommendations in the NEPA document or design process, as appropriate. The VE study shall be performed in accordance with Federal Highway Administration's (FHWA) current guidelines and recognized techniques, and will identify possible alternatives that may save the project cost, time or other resources. An individual with prior experience and certification in facilitating VE studies (the VE facilitator) shall conduct each VE session. VE facilitators shall be qualified VE practitioners, experienced in performing and leading VE studies (have participated in several VE studies as a team member and several as a team leader), and have sufficient VE training, education, and experience to be recognized by the Society of American Value Engineers (SAVE) International as meeting the requirements for certification.	C	X	
The VE team will consist of individuals with no prior exposure to the project. Individuals that have some familiarity and history with the project shall provide briefings to the team. Consultants or firms shall not conduct studies of their own designs unless they maintain distinct organizational separation of their VE and design sections. The VE team will be assembled to review the Conceptual Background information and plans shall be provided to the team at least three weeks in advance of VE sessions. The VE facilitator will coordinate the study with CDOT, appropriate entities, and FHWA. The VE review team will formally evaluate each VE recommendation, and sufficient justification will be made for the acceptance or rejection of each. The VE facilitator			

	CDOT (C)/ Other*	Consultant	Not Applicable
will produce a document that summarizes the results, as well as the project elements investigated. The Consultant/PM shall prepare a written response detailing which recommendations were not included, the reasons for exclusion, and how all approved VE results will be incorporated into subsequent engineering efforts. These responses shall be forwarded to the CDOT/PM for distribution to the CDOT Region Transportation Director, FHWA, and other appropriate entities. All approved VE proposals shall be incorporated into the final design plans			
6. 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 environmental personnel. Included in this written permission will be the names and telephone numbers of persons to contact should notification prior to entry be necessary.	C	X	
A. **Signature Copies** Permissions apply to CDOT personnel as well as Consultant personnel. CDOT Form 730 may be used for this purpose. Signed copies of written permission will be submitted to the CDOT/PM prior to entering private property for survey work.	C	X	
B. **Permits** Some activities such as materials testing on existing pavement and structures may require a permit. Permits will be obtained and copies submitted to the CDOT/PM.	C	X	

SECTION 6
ENVIRONMENTAL WORK TASK DESCRIPTIONS

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

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

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 *Other Agency Abbreviations – None at time of contract. Others may be added as necessary based on work requirements.**

	CDOT (C)/ Other*	Consultant	Not Applicable
1. CONSULTANT DISCLOSURE STATEMENT			
40 Code of Federal Regulations (CFR) Section 1506.5(c) specifies that a disclosure statement to avoid conflict of interest must be prepared. If an environmental document is prepared with the assistance of a consulting firm, the firm must execute a disclosure statement.	C	X	
2. PROJECT INITIATION			
A. **Environmental Scoping Task** An early environmental coordination/scoping task will occur as directed by the CDOT/PM. An environmental scoping meeting should be held with the Regional Environmental Project Manager, the Regional Project Manager, appropriate members of the Environmental Programs Branch (EPB), C/PM, and staff from Right-of-Way, Maintenance, Hydraulics, Traffic, Property Management, and Utilities, as appropriate. This task will include a meeting with CDOT and the local agency representatives to discuss the initial work efforts of the project.	C	X	

	CDOT (C)/ Other*	Consultant	Not Applicable
B. **Review Applicable Existing Documents** Review project-specific documents or data related to the assessment of environmental, social, and economic resources and impacts in the project area that are determined relevant. Examples of relevant documents are previous studies, planning efforts, access management plans, safety assessments, and other traffic studies. These resources may be CDOT documents or may have been created by local planning agencies or municipalities.	C	X	
C. **Extent of Study Required for Resources** Determine the extent of study required for each resource area. The extent of study can be defined in four categories: 1) complete analysis required; 2) short analysis to define resources/impacts; 3) no analysis required; or 4) analysis already completed (for example, by a previous study).	C	X	
D. **Preparation and Coordination of Requirements** During the early coordination/ scoping process, determine the effort required for the preparation and coordination requirements to allocate: 1) work to be completed by CDOT Region Staff; 2) work to be completed by CDOT Headquarters Staff; 3) work to be completed by Consultant or its project partners; and 4) outside agency concurrence or approvals required.	C	X	
E. **Extent of Narrative Required** For each resource, determine during the scoping phase the extent to which documentation is required for each resource. The level of documentation can be included in several ways, such as: 1) a complete analysis/ documentation included in the text; 2) a summary of the analysis performed included in the text; 3) a statement that no impacts are expected; or 4) inclusion of information and coordination/documentation, such as technical memoranda, reference/ annotated bibliography, in an appendix of the document, referencing the appendix in the body of the text. This will be detailed to the extent possible using information available during the scoping phase.	C	X	
F. **Project Study Area Limits/Logical Termini** Preliminary project study area limits are established in Section 1 of the Generic Scope of Work document. Perform necessary research and data collection to propose a study area boundary for environmental resources and logical termini for use in scoping. In coordination with the CDOT/PM, prepare a recommendation to the Federal Highway Administration (FHWA) for approval of the logical termini, if applicable.			X
G. **Administrative Record** Maintain a NEPA Administrative Record that adheres to the established process. Make available any and all parts of this Administrative Record to the CDOT/PM (or his or her designee), or the Colorado Attorney General's office (as requested) at any time during the project's duration. All materials associated with the project Administrative Record will be delivered when closing the project in the format specified by the CDOT/PM. Final project invoice payments to the Consultant are conditional upon the professional and complete delivery of these materials to CDOT's office. Given the extent of documentation collected for the NEPA process, it is required that the consultant update the record regularly and provide information to CDOT electronically.			X

	CDOT (C)/ Other*	Consultant	Not Applicable
3. ENVIRONMENTAL ANALYSIS AND DOCUMENTATION			
Determine the effort required to examine the transportation needs in the project area definitively and completely, to develop and evaluate transportation alternatives following the NEPA process, and to develop the appropriate NEPA documents. All environmental documentation, technical reports and technical memos will be submitted to CDOT, and may be required to be supplied to reviewers at CDOT EPB, FHWA, and the cooperating agencies for early review as appropriate and necessary.			X
A. **Purpose and Need** Develop a solid Purpose and Need statement, reviewed, and approved by appropriate parties. The objectives of the project should be clearly identified and agreed upon early in the project process to prevent backtracking and limit schedule changes. Develop and refine, as necessary, to address information collected on the project during data collection, transportation analysis, and public and agency scoping and involvement. Review previously prepared studies to help direct Purpose and Need information as appropriate (e.g., local planning studies, engineering feasibility studies, etc.). No more than 5 (five) versions of the Purpose and Need will be submitted for review and comment.			X
B. **Alternatives Development and Evaluation** Develop a range of reasonable alternatives not to exceed **[INSERT NUMBER]** alternatives that will satisfy the Purpose and Need requirements of the project, including, but not limited to, those identified in earlier and ongoing studies of the area. The Consultant team, in coordination with CDOT and FHWA, will determine the design year to use for the project. Changes in the design year during the project may be subject to a Scope of Work modification.			X
C. **Evaluate Alternatives Impacts** The consultant shall take into account the projected design-year traffic volumes and projected opening day traffic volumes for new facilities as developed for this Scope of Work, or as modified through later studies and calculations by CDOT. Evaluate the impacts of these alternatives according to established guidelines and examine the degree to which these alternatives satisfy the Purpose and Need requirements of the project. Set out these evaluations both schematically and in narrative form for review within a reasonable time after the notice to proceed.			X
D. **Alternatives Screening Process** Apply an alternatives screening process to identify the reasonable alternatives (practical or feasible from a technical and economic standpoint), which will be subject to a more detailed evaluation. Develop NEPA-appropriate evaluation criteria, and measures of effectiveness, and submit them for review and approval by CDOT and FHWA before beginning the screening process. The rationale for eliminating alternatives will be thoroughly discussed within the documentation.			X

	CDOT (C)/ Other*	Consultant	Not Applicable
E. **Preliminary Design of Alternatives** For each alternative that passes the screening process, incorporate preliminary design for up to **[INSERT NUMBER]** alternatives to a level that clearly allows the identification of impacts within each environmental resource area. These alternatives may be carried through the entire analysis process until a decision document is written. If CDOT or another agency or Consultants performs selected alternative studies, the Consultant shall incorporate the results of these studies into the appropriate document.			X
4. COST ESTIMATES AND FINANCIAL ANALYSIS			
A. **Develop Cost Estimates and Financial Analyses** As part of evaluating reasonable alternatives in the NEPA document, including the No-Action Alternative, develop cost estimates and financial analyses at varying levels of detail throughout the process. Basic engineering, preliminary engineering, construction engineering, construction, and operating/maintenance for the design life will also be analyzed. A funding package identifying the funding sources necessary to construct and maintain the projects will be developed.	C	X	
B. **Incorporate Into NEPA Document** Review the cost estimates and financial analysis, provide supplemental analysis as needed to support the Preferred Alternative, and incorporate findings into the draft NEPA document.	C	X	
C. **Preliminary Construction Cost Estimates** Prepare preliminary construction cost estimates based on 30% design of alternatives identified during the NEPA process. Project right of way acquisition and project environmental mitigation costs shall be included within the cost estimate. Include enough detail to ensure a reasonable degree of accuracy for the level of design performed. Submit the format of estimates, including the year from which the unit costs were assumed, to CDOT's Project Engineer for review and approval. Incorporate the analysis into the NEPA document.	C	X	
5. DATA COLLECTION, FIELD INVESTIGATION, MITIGATION MEASURES			
The following analyses are required for each of the alternatives that pass the screening process. Each resource will be summarized concisely, focusing on the project issues of concern in the NEPA document. The scope shall define the level of documentation, project tasks, and project deliverables for each of the resource areas. Identify the required area and resources to evaluate and determine the early coordination/scoping process as discussed above, but may evolve over the life of the project as new information is discovered through analysis. Reference other projects within the study area (to make sure existing conditions are alike between both projects, understand future planned conditions within the study area, and to appropriately evaluate cumulative impacts to resources); these projects may be related to transportation, but may also be entirely unrelated to transportation (such as a new strip mall, school, park, apartment building, for example). As determined by the Consultant team, the Region, and EPB, a larger area is typically evaluated for cumulative effects.The level of detail and analysis will be determined based on the level of environmental documentation (e.g., Feasibility Study, CatEx, EA, or EIS). It is expected that the level of detail for this NEPA document will be as appropriate for an Feasibility Study, CatEx, EA, EIS. Use of Geographic Information Systems (GIS)	C	X	

	CDOT (C)/ Other*	Consultant	Not Applicable
for environmental data is required to be in compliance with CDOT GIS standards. All GIS data shall be provided to CDOT in electronic format with the annual updates for the administrative record. Relevant information will be incorporated in the NEPA document sections such as: Affected Environment, Environmental Consequences, and Mitigation Measures. In addition, technical reports may be prepared in support of the project and shall be reviewed and referenced as appropriate in the NEPA document. If new or unique resources are identified during scoping, this scope of work will be modified to include these, as appropriate.			
A. **Existing Roadway and Major Structures**			
a Evaluate existing conditions to assess the proposed design relative to the following: i existing roadway safety and structure condition ii general traffic concerns iii geometry and conditions including cross-sections, shoulders, medians and lane widths iv noise walls v Americans with Disabilities Act (ADA) accommodations and compliance vi Guardrail vii Lighting viii Traffic Signal Devices ix Signage, signals, lighting, grades, speeds, components, and structures should be included in the effort.	C	X	
b Construction Requirements: i General construction impact (of temporary nature) ii Material pits iii Haul roads	C	X	
c Multi-modal Transportation: Document existing multi-modal transportation facilities including bike paths/lanes, sidewalks, alignments for transit (heavy rail, light rail, bus routes), transit stops/stations, and multi-modal centers. Signage, signals, lighting, grades, speeds, components, and structures should be included in the effort. Coordinate with the CDOT Division of Transit and Rail to obtain relevant data.	C	X	
B. **Geospatial Data** Assemble, store, manipulate and display data for resources as needed.	C	X	
C. **Air Quality** Perform the necessary air quality assessment or modeling as required and provide the results for integration into the NEPA document and Air Quality Technical Report (with modeling data assumptions). These will include, but are not limited to, analysis or discussion of : NAAQS, carbon monoxide (CO) hot spots, PM 10 hot spot analysis, regional emissions analysis, Mobile source air toxics (MSAT) —qualitative or quantitative, greenhouse gases (GHG), climate change, construction issues such as fugitive dust emissions, and mitigation measures. CDOT staff will lead coordination with the Colorado Department of Public Health and Environment Air Pollution Control Division (CDPHE-APCD) and U.S. Environmental Protection Agency (EPA) (as necessary). The analytical	C	X	

		CDOT (C)/ Other*	Consultant	Not Applicable
	methodologies (including number of intersections to be modeled) will be determined through the coordination. Each Build Alternative and the No-Action Alternative will be analyzed for impacts through the appropriate design year. Mitigation commitments will be developed, as necessary. The Consultant must get approval from the CDOT Region and/or EPB air specialist (and possibly FHWA staff) for any methodologies to evaluate hazardous air pollutants. Utilize the most current standard, accepted FHWA language for MSATs.			
D.	**Geologic Resources and Soil** Perform and document in the NEPA Document, and a Geologic Technical Report, a thorough investigation of the project area to determine possible geologic influences on the alternative designs under consideration, or vice versa. Constraints, including but not limited to major excavations, unsatisfactory sub-grade materials, present and potential subsidence, potential for rockfall, the presence of abandoned mine sites, etc., will be evaluated. This task includes consideration and description of the corridor water table (i.e., depth/gradient).			X
E.	**Water Quality**			
a	Status of the water resources (quality, etc.) for the purposes of describing the "affected environment" before construction: ground water/aquifers, lakes, rivers, streams, and springs. Locations of drinking water treatment plants and locations of sewage treatment facilities.	C	X	
b	Water resource and quality impacts of the project during and following construction, determined by considering the project location and design concepts in relation to existing water resources including groundwater or alluvial waters or aquifers (particularly sole source), drainage ditches and other State Waters as defined by CDPHE Water Quality Control Division, aquatic as well as riparian habitat, and Sensitive Waters (Class 1 Aquatic Life, Recreation 1, and Water Supply, 303[d] listed, etc).	C	X	
c	Municipal Separate Storm Sewer System (MS4) and Colorado Discharge Permit System (CDPS) design and permitting issues.	C	X	
d	A mitigation plan that includes conclusions of effects, permanent best management practices (BMPs), temporary/construction BMPs, erosion control measures, and definition of maintenance responsibilities.	C	X	
e	The Driscoll Model will be used for this project.			X
f	Water Quality Technical Report	C	X	
F.	**Floodplains Assessment**			
a	Identify location of floodplains and any planned changes to the floodplains from adjacent development.	C	X	
b	Add information to environmental resource mapping of existing conditions.	C	X	
c	Determine the probable impacts of each alternative with respect to floodplains and drainage.	C	X	
d	Identify adverse effects on the project area with respect to floodplains and drainage for each alternative (including during construction and relative to actual operating conditions).	C	X	
e f	Develop possible actions to mitigate for the adverse impacts and coordinate with roadway and structural designers.	C	X	

		CDOT (C)/ Other*	Consultant	Not Applicable
g	Analyze the impacts and mitigation. Included in the analysis will be a determination of significant impacts due to:	C	X	
i	Single community access routes.	C	X	
ii	Risk for social or economic losses due to flooding.	C	X	
iii	Alteration of beneficial floodplain values.	C	X	
iv	Recommend preparation of Conditional Letter of Map Revision (CLOMR), Letter of Map Revision (LOMR) requirement	C	X	
h	Prepare a Floodplain and Drainage Assessment Report which will incorporate appropriate water quality control measures and BMPs as per the CDOT MS4 permit, New Highway Development program. If prepared, the report will be reviewed by the Region or EPB specialist and then finalized.	C	X	
G.	**Wetlands**			
a	Wetlands Determination/Delineation:			
i	Conduct a field evaluation for the presence of wetlands within the project study area. Global Positioning System (GPS) should be used for this activity.	C	X	
ii	Delineate the boundaries and size of all anticipated jurisdictional and non-jurisdictional wetlands and waters of the US within the project area. using United States Army Corps of Engineers (USACE) guidance listed in Appendix A.	C	X	
iii	Prepare wetlands maps that delineate the wetland boundaries within the corridor. GPS will be used for this mapping.	C	X	
iv	Coordinate the findings with the CDOT Region and the USACE. Obtain jurisdictional determination of the wetlands from the USACE.	C	X	
b	Wetland Finding Report Prepare a Wetland Finding Report. The Functional Assessment of Colorado Wetlands (FACWet) should be used, as appropriate according to current CDOT procedures. Conduct a wetland assessment based on the NEPA document addressing the amount of permanent and temporary wetlands impacts and mitigation. Wetland mitigation should be identified as early as possible in the NEPA process. Mitigation sites must be evaluated for availability and suitability for wetland habitat.	C	X	
H.	**Vegetation and Noxious Weeds**			
a	Conduct necessary field surveys and identify vegetation and noxious weeds within the project area. GPS will be used for this activity. Plot major vegetation zones/ecosystems, and weed locations and densities on a map.	C	X	
b	Perform an impact analysis.	C	X	
c	Prepare an Integrated Noxious Weed Management Plan **(prior to construction).**	C	X	
I.	**Fish and Wildlife**			
a	Conduct necessary field surveys and identify fish and wildlife and their habitat within the project area. As appropriate, GPS will be used to identify habitat.	C	X	
b	Coordination with the Colorado Division of Wildlife (CDOW) and US Fish and Wildlife Service (USFWS).	C	X	
c	Perform an impact analysis.	C	X	
d	Develop appropriate mitigation measures	C	X	

	CDOT (C)/ Other*	Consultant	Not Applicable
e Prepare Biological Resources Report	C	X	
J. **Threatened and Endangered (T&E) Species**			
a Write letters for the CDOT EPB Wildlife Program Manager's signature to the Colorado Division of Wildlife (CDOW), US Fish and Wildlife Service (USFWS), and Colorado Natural Heritage Program (CNHP) requesting a T&E species list.	C	X	
b Conduct necessary desktop and field surveys and identify T&E species and/or Designated Critical Habitat.	C	X	
c Review existing planning documents to determine any existing Habitat Conservation Plans (HCP) for T&E species.	C	X	
d Identify impacts to species and recommend mitigation.	C	X	
e Based on affected environment and habitat, prepare the T&E species impact assessment.			X
f Develop a Biological Assessment for the USFWS if federally listed T&E species and/or Designated Critical Habitat will be impacted and there is a federal nexus.	C	X	
g Develop a HCP with the USFWS if T&E species and/or Designated Critical Habitat will be impacted and if there is a federal nexus.	C	X	
h Identify any impacts and develop a mitigation plan to conform to requirements of the Endangered Species Act.	C	X	
K. **Historic**			
a. Properties			
i. Perform and provide the survey report for review by the CDOT Region Historian or EPB Senior Staff Historian, and incorporate the information into the NEPA document. The following lists are not meant to be exhaustive.	C	X	
ii. Collection and Evaluation of Baseline Information as defined by Section 106 of the National Historic Preservation Act of 1966, as amended	C	X	
b. Historic Clearance			
i. Determine the area of potential effect (APE), in coordination with CDOT and the State Historic Preservation Officer (SHPO).			X
ii. Conduct a literature and records search for previously recorded historic resources in the APE at the OAHP.	C	X	
iii. Conduct an intensive architectural field survey of the APE and determine National Register of Historic Places (NRHP) eligibility for each resource 45 years or older. Potential resources include man-made structures, ditches, railroads, etc.	C	X	
iv. Identify and coordinate with consulting parties (e.g., public, historic preservation groups, local historical societies, museums) regarding historic properties in the project area.	C	X	
v. Write a comprehensive Historic Resources Survey Report according to guidelines established by the OAHP to submit for review by the CDOT Region and/or EPB Senior Staff Historian.	C	X	
vi. Determine potential impacts, both direct and indirect, to historic resources and recommend mitigation strategies to avoid, minimize, or mitigate impacts.	C	X	

	CDOT (C)/ Other*	Consultant	Not Applicable
vii. Prepare correspondence as necessary for the CDOT Region and/or EPB Senior Staff Historian to submit to the SHPO.	C	X	
viii. Collaborate with the CDOT Region Historian or EPB Senior Staff Historian to develop a Memorandum of Agreement, if necessary, with recommended mitigation strategies for adverse effects for agency review and execution.	C	X	
ix. Prepare Section 4(f) documents as required.	C	X	
x. Work with the CDOT Region historian or EPB Staff Historian to obtain any necessary approvals.	C	X	
c. Historic Bridge Clearance (if applicable)			
i. Assist CDOT to research the Statewide Historic Bridge Inventory to determine the eligible or non-eligible status of bridges that may be in the project area.	C	X	
ii. Prepare correspondence as necessary for the CDOT Region and/or EPB Senior Staff Historian to submit to the SHPO.	C	X	
iii. If bridges that have been determined to be eligible or listed on the NRHP are present, develop alternatives to bridge replacement, including: No-Action, rehabilitation, build a companion structure, build a new bridge in a different location, and others dictated by the project circumstances.	C	X	
iv. Collaborate with the CDOT Region and/or EPB Senior Staff Historian to develop a Memorandum of Agreement, if necessary, to mitigate adverse impacts to historic bridges for agency review and execution.	C	X	
v. Prepare a archival documentation or other creative mitigation of the bridge to mitigate adverse effects according to standards established by the OAHP.	C	X	
vi. When applicable, prepare information for CDOT Adopt-a-Bridge program to mitigate adverse effects.	C	X	
vii. Work with the CDOT Region and/or the EPB Senior Staff Historian to obtain any necessary approvals.	C	X	
viii. Prepare Section 4(f) documents as required.	C	X	
d. Archaeology			
i. A review of historic Sanborn Fire Insurance maps and other appropriate archival sources will be completed to determine if the area may contain significant archaeological sites or features.			X
ii. Conduct an intensive field survey of the project corridor(s) and undertake site-specific test excavations, as necessary and appropriate, to determine NRHP eligibility. The Consultant shall not undertake test excavations before consulting with CDOT.			X
iii. Complete laboratory analyses of all collected artifacts and ancillary specimens.			X
iv. Write a comprehensive survey report according to guidelines established by the OAHP.			X
v. Develop a data recovery plan to mitigate potential adverse effects to significant archaeological localities, as appropriate and necessary.			X
vi. Coordinate the mitigation plan with the EPB Senior Staff Archaeologist, SHPO, and other required agencies.			X
vii. Conduct data recovery excavations at any significant archaeological site that cannot be avoided during construction.			X

	CDOT (C)/ Other*	Consultant	Not Applicable
viii. Analyze artifacts.			X
ix. Prepare and submit a data recovery excavation report which describes, in a thorough and comprehensive fashion, the project results and the nature of the site in the context of the regional archaeological database. The report must also include site management recommendations in the context of the NRHP.			X
x. Coordinate Tribal consultation and support EPB Senior Staff Archaeologist as needed.			X
xi. Prepare Section 4(f) documents as required.			X
L. **Paleontological Resources**			
a Perform a literature and museum fossil database search and field assessment.			X
b. Determine the presence or absence of paleontological resources.			X
c. Conduct analysis to determine the scientific significance (research and/or educational value) of the resource.			X
d. Write the paleontological technical report, including mitigation proposals, if necessary. The assessment report will be reviewed by the EPB Staff Paleontologist for adequacy.			X
e. Coordinate the mitigation plan with the EPB Staff Paleontologist.			X
M. **Land Use** Collect, map and evaluate baseline information. Prepare information on land use and zoning, including maps of existing, planned and future uses. Prepare land use mapping. Mapping may include parcel use categories such as: land in public ownership, commercial, retail, wholesale, industrial, residential, vacant, mixed etc. which identifies jurisdictional boundaries and land usage along each alternative. (Information may be obtained from Department of Local Affairs, from old Sanborn maps, from archival aerial photos, from the local city, town or County, and/or from field verification.) Identify any impacts or consequences to land uses and recommend appropriate mitigation measures as necessary.	C	X	
N. **Social and Economic Resources** Collect, map, and evaluate baseline information to investigate and document the effects of the project alternatives on community cohesion, safety and security, neighborhoods, and accessibility of facilities and services. Investigate the effects of the project alternatives on commercial and industrial enterprises, employment, local tax base, regional earnings, etc. When relevant, recent Census data shall be utilized. This will be done at the regional and corridor level, as well as part of a cumulative effects analysis, as appropriate. Identify any impacts or consequences and recommend appropriate mitigation measures as necessary.	C	X	
O. **Environmental Justice** Collect the necessary U.S. Census and other applicable data to identify existing low-income and minority populations, as well as adverse effects and mitigation measures or alternatives that would avoid or reduce the impacts according to environmental justice guidelines. Impacts to these communities will be evaluated using CDOT and FHWA guidance in accordance with Executive Order 12898. Beneficial effects of the project on these populations will also be identified. The analysis will cross-reference other resources as appropriate (e.g., noise, air and water pollution,	C	X	

	CDOT (C)/ Other*	Consultant	Not Applicable
aesthetics, community cohesion, relocation impacts). As part of the project's public participation or public involvement program, ensure that meaningful opportunities for all members of the community to provide input to the project exist. Document the degree to which affected low-income or minority populations have been afforded the opportunity to provide input in the NEPA process related to the development of purpose and need, alternatives analysis and screening, , impact analysis, preferred alternative identification, and mitigation measures development. Collaborate with EPB's Environmental Justice specialist to determine the level of Environmental Justice outreach activities necessary to obtain sufficient input from low-income and/or minority populations. Document all outreach efforts and input (or feedback) for low-income and/or minority communities within an Environmental Justice Technical Report.			
P. **Bicycle and Pedestrian Facilities** Research and identify existing and future planned bicycle and pedestrian facilities in the project area. The necessary data will be collected from project design documents, community transportation plans, local land developers, open space and park trails, or local governmental agency or community interest groups to determine if any facilities will be impacted, and as a result what mitigation is necessary. If the corridor is a heavily traveled biking facility, the scope of work shall include meetings to coordinate with bike users throughout the NEPA process. (If Section 4(f) resources are impacted see Section 4(f) and 6(f) Evaluation.)	C	X	
Q. **Residential/Business/Right-of-Way (ROW) Relocation** The following activities will be performed and documented by a qualified member of the Consultant team, in coordination with the CDOT Region ROW manager (or designee), or Headquarters ROW specialist assigned to the project, in accordance with Title 23 CFR 710:			
a Prepare a table identifying and listing all potentially affected properties including, at a minimum, ownership names, property and mailing addresses, estimated areas of impacts, and indicating which alternatives impact each property. This table will be submitted to the CDOT Region ROW Manager for review and may be included in the NEPA document (without personal property details) at the discretion of the CDOT Region and/or Headquarters ROW staff.	C	X	
b. Perform a ROW field inspection of each short-listed alternative. Ascertain number of parcels, types of improvements, and possible issues (e.g., historic sites). Estimate family sizes for residential relocations.	C	X	
c. Compile a ROW acquisition and relocation cost estimate for preferred alternative.	C	X	
d. Prepare a property ownership map based on tax records, which identifies ownerships for preferred alternatives.	C	X	
e. Develop and document mitigation measures	C	X	

		CDOT (C)/ Other*	Consultant	Not Applicable
R.	**Transportation Resources**			
a	Develop traffic volumes using available traffic demand models; determine the design year during the scoping process for the project. The model expected to be used for this project is the 2035 model. Forecasts should be based on existing roadways and roadways that are committed to be constructed (that is, "No Action"—those that will be constructed regardless of whether the project in question moves forward). Future traffic forecasts must be developed for the No-Action Alternative and any build alternatives. The results of the travel demand forecast process will be developed into a technical report.	C	X	
b.	Analyze existing and future traffic operations analysis will be conducted for the No-Action Alternative and build alternative(s). Analysis will be completed in accordance with the latest edition of the Highway Capacity Manual or similar methodology. In addition, the Consultant shall use a micro simulation software package (i.e., CORSIM, VISSIM, Dynasmart-P, or others as approved by CDOT) to evaluate the operations of the entire roadway network and report the appropriate measures of effectiveness for the alternative(s). The selection of the software package for the required analyses will depend on the size and other characteristics of the network, the alternatives to be analyzed, and the measures of interest. At a minimum, analysis will consider existing traffic volumes, accident history, percent of truck traffic, directional splits on all arterials, turning movements at intersections, interchange and ramp characteristics, travel/access patterns, level of service, delays, travel times and speeds, and areas of congestion. During the alternatives development and evaluation process, the appropriate level of operations analysis will also be conducted on the alternatives being considered. The results of the operations analysis are documented into a Transportation Technical Report.	C	X	
c.	Conduct safety analysis and document accident rates based on data collected from local emergency services, Colorado State Patrol, and CDOT Traffic Analysis Unit; obtain weighted hazard index from CDOT/PM; evaluate trends; document safety issues and how they can be addressed.	C	X	
S.	**Utilities and Railroads** Collect utility location key maps for all existing and planned utilities in the area in coordination with the CDOT Region utilities specialist. Conduct all field utility locates. The potential impacts on or from utilities in the project area will be analyzed as well as any appropriate mitigation measures.	C	X	
T.	**Section 4(f) and Section 6(f) Evaluation**			
a	Inventory and map project area for Section 4(f) and/or 6(f) facilities.			X
b.	Determine if any potential impacts or ROW acquisitions include Section 4(f) properties (e.g., publicly owned parks, recreational facilities, nationally significant historic sites, wildlife refuges) or Section 6(f) properties (those that have received Land and Water Conservation Funds).			X

	CDOT (C)/ Other*	Consultant	Not Applicable
c. Determine and evaluate project impacts on Section 4(f) and/or 6(f) properties using preliminary design information, and the necessary commitments for mitigation measures. Determine whether impacts qualify under the "de minimis" 4(f) use. Prepare an analysis that includes avoidance alternatives, discussion of prudent and feasible, least harm (if necessary), minimization, and mitigation related to Section 4(f) properties. This may include the development of a new alternative(s) as an avoidance alternative(s)			X
d. Determine if the Section 4(f) use could be evaluated as a De Minimis Finding. If so, prepare that documentation in consultation with CDOT Region or EPB Staff.			X
e. Prepare the Draft and Final documentation for Section 4(f) and/or 6(f) evaluation. This will go through the Region Planning and Environmental Manager (RPEM) to the EPB for review.			X
f. Prepare evaluation and coordinate reviews with RPEM and EPB staff for review by FHWA.			X
U. **Farmlands** In coordination with the Natural Resource Conservation Service (NRCS), investigate and quantify the effect of the project alternatives on farmlands—determining whether farmlands in question are classified as "prime" or "unique," as well as the extent to which impacts may affect local communities. The US Department of Agriculture Farmland Conversion Form (Form AD 1006) will be completed as necessary. Develop mitigation measures, if applicable, for impacts.			X
V. **Noise** Prepare a technical noise assessment in accordance with the most recent CDOT Noise Analysis and Abatement Guidelines and submit a comprehensive noise assessment document to CDOT for review and acceptance. The analysis will consist of the following, each of which must be covered in the noise assessment document:			X
a Definition of relevant noise abatement criteria and identification of noise-sensitive land uses.			X
b. Determination of existing noise levels (by measurement and/or modeling).			X
c. Prediction of future traffic noise levels for all alternatives, including the No-Action Alternative, using FHWA's current Traffic Noise Model.			X
d. Determination of traffic noise impacts.			X
e. Identification and evaluation of feasibility and reasonableness of noise abatement measures. Coordinate with Project Engineer with regards to locations and heights of proposed abatement measures.			X
f. Development of recommendations regarding noise abatement measures.			X
g. Assessment of construction related noise issues.			X
h. The above items will be addressed and documented in a Noise Technical Report, which will be prepared and submitted to CDOT for review and acceptance. Prior to beginning this work, the Consultant shall meet with CDOT to review the appropriate noise methodology. Noise modeling should be completed for the model year 2035. The draft and final technical report will be completed and made available to the CDOT Noise Specialist for review; the findings will be incorporated into the NEPA document.			X
W. **Visual Resources** Identify and inventory the highway corridor landscape units/types/themes, and project view shed; identify key views, including to and from the highway and other	C	X	

	CDOT (C)/ Other*	Consultant	Not Applicable
likely locations of viewers; analyze existing visual resources and viewer response/exposure and any impacts expected from the project. Recommend and develop mitigation measures for identified impacts. When specified, the following will be investigated: natural areas (e.g. scenic landscapes such as national parks or forests), wildlife habitat, topography, major drainages, unique land forms, soil types, plant communities. Quality (including vividness, intactness, and unity); viewer sensitivity/exposure (over space and time) and existing aesthetic liabilities.			
X. **Energy** Discuss in general terms the construction and operational energy requirements and conservation potential of various alternatives under consideration. The discussion should be reasonable and supportable. A calculation of energy consumption during construction should be included.			X
Y. **Hazardous Materials** Perform and document the following Initial Site Assessment (ISA) and/or Modified Environmental Site Assessment (MESA) activities:	C	X	
a Conduct regulatory research that includes the collection, mapping and Evaluation of data for the following resources:	C	X	
i Hazardous Waste Lists compiled by U.S. EPA or CDPHE which identify, utilizing a database provider if appropriate.	C	X	
ii Records kept by U.S. EPA or CDPHE on hazardous waste regulation violations or citations	C	X	
iii Lists kept by the appropriate fire department	C	X	
iv Available historic tax records which indicate past land use (coordinate with property ownership and land use data research), such as Sanborn Fire Insurance Maps	C	X	
v Available historic aerial photos of the corridor (e.g., United States Geological Survey, public libraries, etc.)	C	X	
vi Historic topographic maps	C	X	
vii Any pertinent records maintained by CDOT	C	X	
viii Documented personal interviews, if approved by CDOT/PM	C	X	
ix Agency file reviews	C	X	
b. Analyze results of regulatory research and records review and identify potential impacts construction activities may have on existing hazardous waste sites. Assess potential liability issues and hazards to the public and construction workers and develop potential mitigation options. Prepare the ISA/MESA Document to include the following:	C	X	
i Prepare the draft and subsequent final ISAs to address comments provided by CDOT.	C	X	
ii. ISAs will conform to American Society for Testing and Materials (ASTM) standards for Phase I reports (with limitations), and make a determination of the necessity of a Phase II report.	C	X	
iii. Identify how the presence of hazardous waste locations may impact each alternative, including the no-action alternative. GIS mapping will be desired.	C	X	

	CDOT (C)/ Other*	Consultant	Not Applicable
c. Conduct In-Situ Tests via performing the following and providing a survey report, as determined on a project-specific basis:	C	X	
i Select locations for soil boring/monitoring wells based on information obtained above, geologic review, and alignment considerations.	C	X	
ii. Install monitoring wells and obtain soil and water samples for chemical analysis as well as geotechnical and geologic data.	C	X	
iii. Perform asbestos and lead based paint testing as determined appropriate.	C	X	
d. Phase II site assessment if deemed to be important for the alternatives screening process.	C	X	
Z. **Cumulative Impacts** Consistent with CEQ regulations, the cumulative effects of each proposed action on a resource, ecosystem or human community will be evaluated for each alternative. The analysis will both list and consider incremental impacts of each alternative in conjunction with all past, present, and reasonably foreseeable future actions, no matter what entity (federal, non-federal, local government, or private) is taking or has taken the action; but the analysis should only focus on meaningful effects. Develop the scope of the analysis in consultation with FHWA and CDOT, and, in general, will base temporal and spatial boundaries on the natural boundaries of resources of concern and the period of time that the proposed action's impacts will persist. The analysis will be incorporated into the NEPA document, and mitigation measures specific to cumulative impacts, if needed, will be identified. Standard FHWA global climate change language is to be incorporated within every cumulative impacts section of a NEPA document.			X
AA. **Other**			X
6. DELIVERABLES			
The following documents will be considered as official deliverables. Deliverables to CDOT will occur at the dates agreed to within the project contract and related agreements. This list is not all-inclusive as other submittals may be required as necessary.			
A. Hydrologic/Hydraulic floodplain analysis with all necessary local, State, and Federal floodplain submittals through approvals.	C	X	
B. All other deliverables as outlined in the CDOT Project Development Manual	C	X	
7. PUBLIC AND AGENCY INVOLVEMENT			
This section identifies public and agency involvement tasks anticipated for the project.			
A. Develop an Agency Coordination Plan	C	X	
B. Stakeholder Involvement Plan Prepare a Stakeholder Involvement Plan specific to the nature of this project. The level of effort included in the plan will be in keeping with the complexity and expected controversy of the project. Coordinate with the CDOT/PM and project team to identify the level of effort to be documented in the plan. At a minimum, the plan should:	C	X	
a. Develop a stakeholder database	C	X	

	CDOT (C)/ Other*	Consultant	Not Applicable
b. Identify methods for public notification and dissemination of information, such as newsletters, flyers, postcards, web site, press releases, miscellaneous informational materials, etc.	C	X	
8. NEPA DOCUMENTATION PROCESS			
Develop, coordinate, write, review, conduct QA/QC and finalize the appropriate NEPA document in accordance with the current provisions of the following laws, regulations, and standards.			
A. **Preliminary Data Submission** Provide a report detailing all the data collected for the resources listed under "Data Collection, Field Investigation and Analysis" and "Environmental Analysis and Documentation" of this Scope of Work for the affected environment and impact sections of the NEPA document. The level of effort will be directly commensurate with the class of action and degree of controversy of the project. The Scope of Work will be revisited for possible update at the end of this Preliminary Data Submission task when more is understood about the impacts or analyses that will be necessary (determined during scoping and data collection).	C	X	
B. **Draft and Final NEPA Document Preparation** Assign a team leader qualified to (1) manage the NEPA process, (2) develop a schedule for document preparation, printing, review, and comment response, (3) will direct the Consultant team in the following tasks in coordination with the CDOT Region, EPB, and FHWA. The CDOT NEPA Manual specifies the number of copies to be provided for document review for each phase of the NEPA process.			
a. Distribute the internal draft NEPA document and relevant technical reports for review to a distribution list specified by CDOT.	C	X	
b. Lead the effort with Consultant team to determine whether the "class of action" (EA or EIS) decided upon during the scoping process is still valid after the impacts and mitigation measures have been determined. This will be determined with no more than two meetings.			X
c. Determine review process to be used for the NEPA document.			X
d. Coordinate the impacts and mitigation measures with CDOT, and appropriate agencies, and FHWA. Take necessary actions to resolve issues.	C	X	
e. Prepare a NEPA document outline for review by CDOT and FHWA. Prepare no more than three versions of the outline to be submitted and reviewed, with reviews and approvals being conducted by CDOT, FHWA, and other appropriate agencies.			X
f. Prepare and provide to the CDOT Region the complete draft NEPA document and relevant technical reports [in paper format and also in electronic format]. Provide effort for no more than 3 review cycles of the draft NEPA document and relevant technical reports for Region review. Coordinate and conduct no more than two comment resolution meetings for Region comments. If deemed appropriate by the PMT and CDOT, a concurrent review may be conducted between the Region and EPB, at which point combine tasks a and b above may be combined.	C	X	
g. Prepare and provide to CDOT EPB up to **3** versions of the complete draft NEPA document and relevant technical reports. Provide effort for no more than **3** review cycles of the draft NEPA document and relevant technical reports for	C	X	

		CDOT (C)/ Other*	Consultant	Not Applicable
	CDOT EPB review. Coordinate and conduct no more than two comment resolution meetings for CDOT EPB comments.			
h.	Prepare and provide to FHWA Colorado Division and FHWA Legal up to **2** Versions of the complete draft NEPA document and relevant technical reports. Provide effort for no more than **1** review cycles of the draft NEPA document and relevant technical reports for FHWA Colorado Division and FHWA Legal review. Coordinate and conduct no more than two comment resolution meetings for FHWA comments.	C	X	
i.	Distribute the draft NEPA document and relevant technical reports for review to a distribution list specified by CDOT. Prepare no more than 5 versions of the draft NEPA document and relevant technical reports with each version including a comment/response period. Provide effort for no more than 2 review cycles of the draft NEPA document and relevant technical reports. Coordinate and conduct no more than two comment resolution meetings for distribution list comments.	C	X	
j.	After each review cycle, make appropriate revisions to each subsequent version draft NEPA document and relevant technical reports until all comments are sufficiently addressed. Copies of each subsequent draft shall be provided to CDOT for distribution to CDOT, and appropriate agencies, and FHWA. A review meeting will be held to discuss review comments, if needed.	C	X	
k.	For the review cycles listed above, prepare a comment/response matrix for each draft NEPA document and relevant technical reports that describes how each comment was addressed. This matrix will be distributed with each version of the draft document and relevant technical reports that CDOT and FHWA review.	C	X	
l.	Submit the NEPA document to CDOT for signature and routing to FHWA for approval.	C	X	
m.	Draft NEPA Document Distribution, Advertising and Public Review, Review and Concurrence, and Public NEPA Document Availability and Advertisement	C	X	
C.	Provide the following services in coordination with the CDOT Region or EPB specialist [or CDOT Public Relations specialist as appropriate]:			
a.	Create draft and final text for the public Notice of Availability of the NEPA document and the date, time and location of the public hearing [if appropriate for NEPA document] for placement in all appropriate local papers and within the Federal Register [if for an EIS] and provide to the FHWA Operations Engineer for processing.			X
a	Follow the signature process outlined in the CDOT NEPA Manual.	C	X	
b	Prepare all aspects of the project necessary for public review of the NEPA document and relevant technical reports, including placing the documents in libraries, on the project web site, and with agencies. For public dissemination the Consultant shall provide an agreed upon number of copies of the signed NEPA document.	C	X	
c	Compile public comments in determined format by CDOT/PM.	C	X	
d	Provide an electronic version of the NEPA document and relevant technical reports on the CDOT website in PDF, or other read only format.	C	X	
e	Make revisions to the final draft NEPA document and relevant technical reports. The resulting NEPA document and relevant technical reports will be provided to CDOT for distribution and final review, prior to preparing the signature copy.	C	X	

	CDOT (C)/ Other*	Consultant	Not Applicable
Provide certification that all comments have been addressed. CDOT will produce the signature copy of the NEPA document and relevant technical reports [to CDOT] for signatures and routing to FHWA for approval, and then will provide copies of the signed final NEPA document to CDOT.			
D. **Public Hearing**			
a. Provide the following services, in coordination with the CDOT Region and EPB, for no more than 1public meetings:	C	X	
b. Determine location for public meeting and ascertain that facilities are ADA compliant			X
c. Advertise the public hearing/meeting date and location. The following media will be used for advertisement: Select from the following or add others.	C	X	
d. Hire translator, or sign language communicator, as needed	C	X	
e. Provide audio/visual equipment and support for presentations, as needed	C	X	
f. Prepare the graphics/display boards to include, at a minimum, the following features:	C	X	
i. Purpose of and need for project	C	X	
ii. Maps showing alternatives	C	X	
iii. Description of social, environmental and economic impacts	C	X	
iv. Design features	C	X	
v. Consistency with federal and local plans	C	X	
vi. Right-of-way information, acquisition, and construction	C	X	
vii. Source and amount of funding	C	X	
viii. Location of 4(f) properties if required	C	X	
ix. Any other project-specific resource impacts deemed appropriate	C	X	
x. Mitigation measures that warrant public disclosure or relevance	C	X	
xi. Anticipated project schedule and next steps	C	X	
xii. How and where the public can provide comments	C	X	
g. Provide a court reporter (if public hearing) and prepare a certified transcript of the public hearing within 7 working days after the public hearing/meeting.	C	X	
E. Decision Document (FONSI/ROD) Preparation			
a. There is no guarantee of the outcome of the NEPA process in order to determine next steps after an [EA/ EIS], and therefore a scope of work cannot be prematurely developed for the NEPA decision document. This scope of work and contract will be reevaluated once the preliminary [EA/DEIS/FEIS] process is complete and the lead agency has made a decision on how to proceed.			X
b. In the event that significant impacts are identified in the EA, the NEPA process would be required to continue to the preparation of an EIS rather than a FONSI. Continuing to preparation of an EIS after completion of an EA is at CDOT's and FHWA's discretion, and should not be considered part of the initial EA scope of work. At this point, a separate Consultant contract would be required, with a new scope of work.			X
c. In the event that a decision document is deemed necessary, this contract and scope of work would be amended with the concurrence and agreement of both CDOT and FHWA (and other applicable agencies). At the conclusion of the public comment period, (if the project is determined to have no significant impact, a Finding of No Significant Impact (FONSI)) (if determined to have a significant impact then a Record of Decision (ROD)] document may be			

	CDOT (C)/ Other*	Consultant	Not Applicable
prepared. In the event a scope of work is prepared for a NEPA decision document to be drafted, the following services would be addressed in coordination with the Region and EPB:			
i. Prepare draft NEPA decision document and relevant supporting documentation for incorporating comments received at the public hearing/meeting or from the NEPA document public review period.	C	X	
ii. Submit draft NEPA decision document (note how many copies: electronic vs. paper) and relevant supporting documentation to CDOT Region, EPB, and FHWA for **2** reviews.	C	X	
iii. Coordinate and conduct a draft NEPA decision document and relevant supporting documentation review meeting and modify the draft decision document to respond to comments received. Provide certification that comments have been addressed.	C	X	
iv. If necessary, re-submit the draft NEPA decision document and relevant supporting documentation for review to ensure that all comments have been made.	C	X	
v. If necessary, modify the draft NEPA decision document and relevant supporting documentation to respond to comments received.	C	X	
vi. Submit final NEPA decision document and relevant supporting documentation for signature using the signature process outlined in the CDOT NEPA Manual. Make no more than **10** hard copies and **20** electronic versions of the final NEPA decision document and relevant supporting documentation on compact disc.	C	X	
d. This Scope of Work could be supplemented for additional as-yet unidentified work, if CDOT determines additional work is warranted or needed. In the event that none of the alternatives are selected at the conclusion of the [EA/EIS] process, this portion of the scope and contract will be voided.	C	X	

SECTION 7
PRECONSTRUCTION WORK TASK DESCRIPTIONS

Note: **The following activities of communication, consensus building, project team reviews, conceptual design, data gathering, documentation, and formal public notice shall be planned by the Consultant and coordinated with the CDOT/PM. The time of their accomplishment will overlap and parallel paths of activity should be planned to finish the development phase in accordance with the shortest possible schedule. A project plan shall be developed by the Consultant which satisfies the requirements of the project development. This plan must be approved by the Contract Administrator (see Section 2.01) before starting the work.**

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 – None at time of contract. Others may be added as necessary based on work requirements.**

	CDOT (C)/ Other*	Consultant	Not Applicable
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. **Independent Design Review** An independent design review shall be performed on any design accomplished by others that will be used in this project. A report identifying the results of these reviews shall be submitted to the CDOT/PM within one week of the review.	C	X	
C. **Identify Design Criteria** Submit a copy of Appendix B -Specific Design Criteria with the appropriate items completed.	C	X	
D. **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	
E. **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.	C	X	
F. **Structure Review Meeting** While the major structural design work is progressing, the Consultant shall meet	C	X	

	CDOT (C)/ Other*	Consultant	Not Applicable
periodically with the CDOT Structure Reviewer 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.			
G. **Initial Submittals** Submit the following samples to the CDOT/PM for approval:			
a An original plan sheet that complies with this scope of work	C	X	
b Photogrammetric and/or survey data and a drawing or photograph in accordance with the requirements specified in this scope of work	C	X	

Note: No original plan sheets or photogrammetric survey work will be accomplished until satisfactory samples have been received and approved by the CDOT/PM.

H. **PROJECT DEVELOPMENT**			
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.			
a Presurvey Conference A presurvey conference shall be held. The consultant shall attend the Presurvey conference prior to any right of way or survey work	C	X	
b. Survey Data Research. Research shall be done as per current CDOT manuals	C	X	
c Project Control Survey:	C	X	
i. Locate or Establish HARN Stations Project control shall be tied to the nearest Colorado High Accuracy Reference Network Station (HARN). In the event there are no HARN stations within 3 miles of the project (Order B, 1:1,000,000 accuracy), or HARN Densification (Order B-2, 1:500,000 accuracy), additional HARN Densification stations shall be set. NGS Blue Book procedures shall be followed for all HARN Densification stations. This will include proper spacing using proper monumentation, equipment, observation procedures, coordination through the Colorado State Geodetic Advisor and submission to NGS for inclusion in the National Database.	C	X	
ii. Monumentation Materials will be supplied by CDOT. Care is to be taken to install said monumentation in locations that are readily usable for the project and in a safe location so that they can be utilized throughout construction (no monumentation shall be set on or near the centerline of the proposed roadway).	C	X	
iii. Local Project Control Survey the required project control (centerline/baselines and elevation reference) as required. Prepare a control survey diagram showing graphical representation of all monuments used for control. Tabulate coordinates and physical	C	X	

	CDOT (C)/ Other*	Consultant	Not Applicable
descriptions of all found monuments and other physical evidence.			
d Land Survey/Boundary Survey Tie aliquot, property and other land monuments to the control survey. Prepare a Land Survey Control Diagram showing graphical representation of all found aliquot, property and land monuments and their relationship to the project control. Tabulate the coordinates and physical description of all found monuments and other physical evidence.	C	X	
e 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, mailboxes, fences, driveways, curb cuts, curbs, sidewalks, and edges of pavements. Horizontal accuracy shall be as specified for a CDOT class C or D TMOSS survey.	C	X	
f Terrain (Relief or Elevation) Survey Collect elevation data and submit in TMOSS format. Natural ground elevations shall be as specified.	C	X	
g Utility Survey Locate utility poles, manholes, valves, pedestals, guy wires, and other visible utility features. Survey underground utilities as marked by the utility companies. Determine invert elevations of manholes and vaults and survey the locations of utilities exposed by "potholing".	C	X	
h 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 and bridges.	C	X	
i Material Sources Survey designated material sources as specified.	C	X	
j Supplemental Surveying As required and specifically requested.	C	X	
k Survey Report Prepare a Survey Report as required in the Survey Manual.	C	X	
l Photogrammetry			
i. Camera Calibration Report	C	X	
ii. Flight Plan	C	X	
iii. Flight	C	X	
iv. Contact Prints	C	X	
v. Negatives	C	X	
vi. Enlargements	C	X	
vii. Photo Index	C	X	
viii. Supplemental Survey (wing points)	C	X	
ix. Data Reduction *A Topographic Contours* *B Planimetric (Topography)*	C	X	
x. Map Compilation *A Index Maps* *B Finished Maps*	C	X	

	CDOT (C)/ Other*	Consultant	Not Applicable
m Accuracy Tests: Tests are to be performed on a regular basis throughout the project by the consultant.	C	X	
n 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.	C	X	
B. **PRELIMINARY DESIGN**			
A. **Traffic Engineering**			
a Review locations with "potential for accident reduction map" and or traffic operations analysis and or the safety assessment report as provided by CDOT to determine which safety improvements will be incorporated into the project.	C	X	
b Analyze the proposed project design with the traffic projection data	C	X	
c Recommend the appropriate geometry (i.e., number of lanes, auxiliary lanes, storage lengths, weaving distances, etc.) in accordance with the current version of Highway Capacity Manual.	C	X	
d The proposed design shall be reviewed to ensure compatibility with existing signing procedures throughout the preliminary roadway design process	C	X	
e Use traffic data appropriate to the anticipated construction timing in developing detour alternatives.	C	X	
f Develop the total ESAL for the design life and submit to the CDOT/PM for the pavement design.	C	X	
g Submit the traffic data and recommendations to the CDOT/PM for review.	C	X	
h Traffic analysis for interchange design	C	X	
i ITS design plans	C	X	
j Coordination with local agencies regarding landscape design and all associated permits (including A-line crossing)	C	X	
k. Detour design	C	X	
B. **Materials Engineering**			
a Preliminary Soil Investigation			
i. Determine test hole locations (horizontal and vertical) and coordinate with the CDOT/PM.	C	X	
ii. Collect soil samples and test for: *A Classification* *B Moisture – Density Relationship* *C Resistance Value* *D Corrosiveness* *Note locations of high corrosiveness with recommendations* *E Bearing Capacity* *F Sulfate Levels*	C	X	
i) Prepare and submit a soils investigation report.	C	X	
iv Prepare and submit pipe materials selection recommendations	C	X	
C. **Pavement**			
a Pavement Rehabilitation This section applies if the project includes existing pavement that is incorporated in the design for continued utilization.			

	CDOT (C)/ Other*	Consultant	Not Applicable
i. Determine the equivalent Design Traffic (18k ESAL) that the existing pavement can carry	C	X	
ii. Estimate the 18k ESAL's experienced by the existing pavement.	C	X	
iii. Obtain the projected 18k ESAL for rehabilitated pavement design period. *A Obtain the historical pavement data for the roadway*	C	X	
iv. Perform a distress survey *A Determine the types of distress present in the pavement* *B Determine the extent of each distress type* *C Develop a distress map for the existing pavement* *D Determine the causes of the existing distress utilizing tests and required analysis.* *E Determine the drainage conditions of the existing surface and subsurface*	C	X	
v. Investigate the existing pavement structure *A Subgrade: soil classifications, moisture/density relationship, resistance value and corrosiveness* *B Base: thickness, gradation, plasticity index, liquid limit, resistance value, strength coefficient* *C Pavement: thickness, strength coefficient*	C	X	
vi. Perform deflection testing to obtain the following: *A Deflection profile* *B Maximum deflection* *C Deflection basin* *D Differential deflections at transverse joints for Portland cement concrete pavement (pccp)* *E In place determination of the appropriate modulus for each layer and subgrade*	C	X	
vii. Determine the remaining load carrying capacity from the above data.	C	X	
viii. Design the feasible alternatives for the required rehabilitation (and widening if appropriate) utilizing the above investigations and test results. The design of the feasible alternatives shall be checked against the following: *A The basic cause of distress which shall be corrected* *B Effect on the rate of future deterioration* *C Effect on surface characteristics* Where appropriate, any new pavement widening shall be included in the analysis.	C	X	
b New Pavement Structure The feasible alternatives of new pavement structure shall be designed utilizing procedures accepted by the CDOT/PM. New pavement designs for widening shall be compatible with adjacent rehabilitated existing pavement.	C	X	
c Pavement Justification			
i Basic factors: *A Desired life expectancy (obtain design life from CDOT).* *B Required maintenance activities intervals.* *C Basis for performance life.*	C	X	

	CDOT (C)/ Other*	Consultant	Not Applicable
ii. Analyze life cycle cost of the selected alternatives *A Perform analysis with unit and maintenance costs from CDOT. Determine present worth and annual costs in accordance with the procedures in the CDOT Pavement Design Guide.* *B Compare alternatives over the same life span.* *C Recommend the pavement structure and provide the basis for the recommendations.*	C	X	
d. Pavement Design Report Include all the above tests, investigations, analyses, and calculations performed as a result of this section. Submit to the CDOT/PM for acceptance.	C	X	
e Pavement Justification Report (PJR) Submit and defend a PJR as outlined in the current CDOT Pavement Design Manual	C	X	
D. **Structures**			
a Existing bridge condition investigation Determine condition of existing bridge deck, superstructure and substructure material as required.	C	X	
b Foundation Investigation Report			
i Prepare a Foundation Investigation Request showing requested test hole locations.	C	X	
i. Formulate drilling pattern, perform the necessary subsurface investigation and collect samples as required.	C	X	
ii. Perform the appropriate laboratory tests and analyze the data. Determine strength, allowable bearing capacity and corrosiveness of foundation material.	C	X	
iii. Perform lateral analyses (deformation, moment, and shear) for the caissons and/or piles which are subjected to lateral loadings. This may be a computer analysis which will consider the group effect and selection of the soil parameters.	C	X	
iv. If appropriate, a pile driving analysis using a wave equation will be accomplished.	C	X	
v. Submit the Foundation Investigation Report to the CDOT/PM for approval.	C	X	
vi. Prepare engineering geology plan sheet and copies of the Foundation Investigation Report foundation report with recommendations for type, size, and tip (bottom) elevation of the required foundation. Specify if pre-drilling, pile tip, casing, dewatering, etc., are needed for foundation construction.	C	X	
E. **Hydrology/Hydraulic Engineering**			
a Hydrology			
i Establish drainage basin data: delineate, determine size, waterway geometrics, vegetation cover, land use.	C	X	
vii. Collect historical data; research flood history and previous designs in the project proximity; and obtain data from other sources (e.g., Urban Drainage & Flood Control District, Colorado Water Conservation, CDOT Maintenance, and local residents).	C	X	
viii. Select a storm frequency based on the established criteria.	C	X	
ix. Complete a hydrological analysis using existing studies or	C	X	

	CDOT (C)/ Other*	Consultant	Not Applicable
approved methods.			
x. Perform a risk analysis.	C	X	
b Hydraulics			
i Accomplish the preliminary design of minor drainage structures: *A Determine location and crossing alignment. Identify channel centerline by highway station or coordinates, as appropriate.* *B Determine the allowable headwater.* *C Assess the degree of sediment and debris problems to be encountered, including abrasion and corrosion.* *D Type, size, shape and material of the structures.* *E Prepare preliminary structure cross-sections to determine the elevations, flow lines, slopes and lengths of the structures. Show the flow quantity on the sections.* *F Complete the design computations.* *G Determine high water level.*	C	X	
xi. A water surface profile and complete hydraulic analysis is required for major structures. Determine the following: *A Water surface profile and hydraulic analysis* *B Required hydraulic size and skew of the bridge* *C Minimum low girder elevation using CDOT criteria* *D The design year frequency* *E The design year and 500 year high water elevations* *F Predicted total scour profile for design year and 500 year scour* *G The channel erosion protection for structures*	C	X	
xii. If required, identify and assist CDOT in coordinating any required potential funding participation of local municipalities or agencies.	C	X	
xiii. Recommend culvert pipe sizes, type, shape and material for proposed detours.	C	X	
c Storm Water Management Plan			
i Initiate a Storm Water Management Plan in accordance with: *A Municipal Separate Storm Sewer Systems (MS4)* *B CDOT's Erosion Control and Storm Water Quality Guide* *C CDOT's Standard Specifications* *D CDOT Standard Plans* *E Other appropriate documents*	C	X	
d Preliminary Hydraulics and Hydrology Report include the following: *A Hydrology analysis* *B Minor structure hydraulic designs* *C Major structure hydraulic designs* *D Detour hydraulic designs* *E Structure cross-sections* *F Storm Water Management Plan* *G Appendix:* *a Drainage basin maps* *b Hydrology/hydraulic worksheets*	C	X	
e. Hydrologic/Hydraulic Floodplain analysis with all necessary local, State, and Federal floodplain submittals (i.e. local flood development permits, LOMR, etc.).	C	X	

	CDOT (C)/ Other*	Consultant	Not Applicable
F. **Utility Coordination**			
a Location Maps Obtain utility location maps from the Utility Companies which identify utility features in the project area. Requests and receipt of maps will be coordinated with the Region Utility Engineer via copies of request and transmittal letters.	C	X	
b Reviews and Investigations Conduct field reviews and utility investigations with the Region Utility Engineer and Utility companies, as required, to ensure correct horizontal and vertical utility data. When possible this will be done utilizing non-destructive investigative techniques. The horizontal and vertical locations will be shown in the FIR plans and cross sections. When "potholing" is required, the Consultant shall be responsible for all necessary excavations	C	X	
c Incorporate utility locations in plans from utility survey	C	X	
d Relocation Recommendations Submit necessary information for the relocation or adjustments of affected utilities to the Region Utility Engineer. The Region Utility Engineer will process the required agreements.	C	X	
e Ditch Company Coordination Contact ditch companies through the Region Utility Engineer to coordinate ditch requirements and restrictions. Develop the plans for the necessary irrigation structures and submit to the Region Utility Engineer for Ditch Company review.	C	X	
G. **Roadway Design and Roadside Development** Coordinate all design activities with required CDOT specialty units and other outside entities.			
a Roadway Design			
i Input, check, and plot survey data	C	X	
i. Verify that a project specific coordinate system approved by CDOT is used to identify the horizontal locations of key points. The coordinate systems used for roadway design and ROW shall be compatible.	C	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 & FHWA.	C	X	
iii. Provide alignments, toes of slope and pertinent design features, including permanent and temporary impacts, to the ROW, Utility and Environmental Managers.	C	X	
iv. Plot/develop all required information on the plans in accordance with all applicable CDOT policies and procedures.	C	X	
v. Using current approved CDOT software, generate a 3 dimensional design model and produce preliminary quantities	C	X	
vi. Detour design	C	X	
b Roadside Development: For roadside items including but not limited to, guardrails, delineators, landscaping, sprinkler systems, sound barriers, bike paths, sidewalks, lighting, curb ramps, truck escape ramps, and rest areas provide the following:	C	X	

		CDOT (C)/ Other*	Consultant	Not Applicable
i	Layouts in the plans	C	X	
iii.	Critical locations in the plans for irrigation sleeves and other utility conduits underneath the proposed roadways.	C	X	
iii.	Coordinate the roadside items with the Storm Water Management Plan (SWMP).	C	X	
H. Right-of-Way The following work shall be done by, or under the immediate supervision of, a Professional Land Surveyor (PLS). The following work may be included as part of a Surveying contract or part of a Right-of-Way plans preparation contract.				
a Research				
i	Identify affected ownership from preliminary design plans	C	X	
ii.	Obtain assessor's maps for the project	C	X	
iii.	Locate documents which transfer title	C	X	
iv.	Prepare chain of title as described in the manual or as directed by the CDOT Project Manager	C	X	
v.	Look for encumbrances, liens, releases, etc.	C	X	
vi.	Make physical inspection of property. Note any physical evidence of apparent easements, wells, ditches, ingress, and egress	C	X	
vii.	Check with local entities such as the County Road Department or County Engineer for location of existing roads or easements	C	X	
viii.	Check for and obtain latest subdivision plats and vacations of streets	C	X	
b Ownership Map For additional detail on required drafting software, see Section 8 Submittals. Project coordinate system ownership map shall be submitted along with a "Project Narrative".				
i	Review preliminary design and survey report.	C	X	
ii.	Review project coordinate system and basis of bearing from Control Survey prior to calculations	C	X	
iii.	Compute alignment of ROW centerline and store coordinates of all found monuments within the first tier of properties left and right of Centerline	C	X	
iv.	Review ownership documents (Memoranda of Ownership and/or title commitments, deeds and supporting plats)	C	X	
v.	Calculate coordinates of lost or obliterated aliquot corners using guidelines established by the Bureau of Land Management. (To be used in resetting corners according to Colorado Revised Statutes)	C	X	
vi.	Establish subdivisions of sections using Bureau of Land Management Guidelines. Show all section lines and ¼ section lines on the ownership map and ROW plans	C	X	
vii.	Determine existing Right-of-Way limits from deeds of record, CDOT plans and found ROW markers. Previous Right-of-Way plans, if available, will be provided by CDOT as an aid	C	X	
viii.	Determine ownerships and their property boundary locations. Locate the intersection of these property boundary lines with the existing CDOT Right-of-Way. Determine location and ownership of existing easements of record.	C	X	
ix.	Secure additional property ties and additional topography where the highway improvement may affect improvements adjacent to the Right-of-	C	X	

		CDOT (C)/ Other*	Consultant	Not Applicable
	Way. This additional topography should include: *A Proximate buildings, sheds, etc.* *B Underground cables and conduits* *C Wells* *D Irrigation ditches and systems* *E Septic tanks, cesspools, and leaching fields* *F Landscaping* *G Other*			
x.	Reconcile overlaps and gaps in ownerships as required by CDOT, documenting method used (may require additional field work). Include reasons for decisions in the "Project Narrative".	C	X	
xi.	Plot OWNERSHIP MAP. If entire ownership will not fit on the sheet at this scale, an additional abbreviated OWNERSHIP MAP may be used at a scale of 1"=1 mile, or other suitable scale, to show the configuration of large ownerships.	C	X	
xii.	Label all monuments found with description of monument and project coordinates (from Control Survey Diagram)	C	X	
xiii.	Show improvements and topography within the ownerships and existing access to the street/county road system.	C	X	
xiv.	Number ownerships alternately as they occur along the centerline from south to north or west to east in the same direction as the stationing. Show current names of owners and lessees	C	X	
xv.	Calculate the total area of all ownerships affected, including coordinates of all property corners. Deduct areas for existing road Rights-of-Way. Bearings and distances do not need to be shown on 1" = 1 mile abbreviated OWNERSHIP MAPS	C	X	
xvi.	Different land uses within a property should be cross-hatched or shaded.	C	X	
xvii.	In the lower right corner of the OWNERSHIP MAP, show seal, number and name of Professional Land Surveyor supervising the work	C	X	
xviii.	Transmit finished reproducible OWNERSHIP MAP, electronic drawing files, and Memoranda of Ownership to CDOT along with all calculations, field notes, and supporting data. The OWNERSHIP MAP will include a copy of the control and monumentation sheet	C	X	
xix.	Prepare temporary easement legals and maps for boring locations if necessary	C	X	
I.	**Major Structural Design** Major structures are bridges and culverts with a total length greater than twenty feet or retaining walls with a total length greater than one hundred feet and a maximum exposed height at any section of over five feet. This length is measured along centerline of roadway for bridges and culverts, and along the top of wall for retaining walls. Overhead sign structures (sign bridges, cantilevers, and butterflies extending over traffic) are also major structures, but are exempt from the structure preliminary design activity defined here. The CDOT Structure Reviewer will participate in coordinating this activity.			
a.	Structural Data Collection	C	X	
i.	Obtain the structure site data. The following data, as applicable, shall be collected: (Typical roadway section, roadway plan and profile sheets	C	X	

		CDOT (C)/ Other*	Consultant	Not Applicable
	showing all alignment data, topography, utilities, preliminary design plan) Right-of-Way restrictions, preliminary hydraulics and geology information, environmental constraints, lighting requirements, guardrail types, recommendations for structure type, and architectural recommendations.			
ii.	Obtain data on existing structures. When applicable, collect items such as existing plans, inspection reports, structure ratings, foundation information, and shop drawings. A field investigation of existing structures will be made with notification to the Resident Engineer.	C	X	
b. Structure Selection and Layout		C	X	
i.	Review the structure site data to determine the requirements that will control the structure size, layout, type, and rehabilitation alternatives. On a continuing basis, provide support data and recommendations as necessary to finalize the structure site data.	C	X	
ii.	Determine the structure layout alternatives. For bridges, determine the structure length, width, and span configurations that satisfy all horizontal and vertical clearance criteria. For walls, determine the necessary top and bottom of wall profiles.	C	X	
iii.	Determine the structure type alternatives. For bridges, consider precast and cast-in-place concrete and steel superstructures and determine the spans and depths for each. For walls, determine the feasible wall types.	C	X	
iv.	Determine the foundation alternatives. Consider piles, drilled caissons, spread footings, and mechanically stabilized earth foundations based on geology information from existing structures and early estimates from the project geologist. To obtain supporting information, initiate the foundation investigation as early as possible during the preliminary design phase.	C	X	
v.	Determine the rehabilitation alternatives. Continued use of all or parts of existing structures shall be considered as applicable. The condition of existing structures shall be investigated and reported. Determine the modifications and rehabilitation necessary to use all or parts of existing structures and the associated costs.	C	X	
vi.	Develop the staged construction phasing plan, as necessary for traffic control and detours, in conjunction with the parties performing the roadway design and traffic control plan. The impact of staged construction on the structure alternatives shall be considered and reported on.	C	X	
vii.	Compute preliminary quantities and preliminary cost estimates as necessary to evaluate and compare the structure layout, type, and rehabilitation alternatives.	C	X	
viii.	Evaluate the structure alternatives. Establish the criteria for evaluating and comparing the structure alternatives that, in addition to cost, encompass all aspects of the project's objectives. Based on these criteria, select the optimum structure layout, type, and rehabilitation alternative, as applicable, for recommendation to CDOT.	C	X	
ix.	Prepare preliminary general layout for the recommended structure. Prepare structure layouts in accordance with current standards. Special detail drawings and a detailed preliminary cost estimate shall accompany the general layout. The special detail drawings shall include the architectural	C	X	

	CDOT (C)/ Other*	Consultant	Not Applicable
treatment. Perform an independent design and detail check of the general layout.			
c. Structure Selection Report Prepare a structure selection report to document, and obtain approval for, the structure preliminary design. By means of the structure general layout, with supporting drawings, tables, and discussion, provide for the following:			
i Summarize the structure site data used to select and layout the structures. Include the following: *A Existing structure data, including sufficiency rating and whether or not the structure is on the "select list".* *B Project site plan* *C Roadway vertical and horizontal alignments and cross sections at the structure* *D Construction phasing* *E Utilities on, below, and adjacent to the structure* *F Hydraulics:* *Channel size and skew, design year frequency, minimum low girder elevation, design year and 500 year high water elevations, estimated design year and 500 year scour profiles, and channel erosion protection* *G Preliminary geology information for structure foundation* *H Architectural requirements*	C	X	
ii. Report on the structure selection and layout process. Include the following: *A Discuss the structure layout, type, and rehabilitation alternatives considered* *B Define the criteria used to evaluate the structure alternatives and how the recommended structure was selected* *C Provide a detailed preliminary cost estimate and general layout of the recommended structure*	C	X	
iii. Obtain acceptance by CDOT on the recommended structure and its layout. Allow approximately two weeks for review of the structure selection report. The associated general layout, with the revisions required by the CDOT review, will be included in the FIR plans. The structure selection report, with the associated general layout, must be accepted in writing by CDOT prior to the commencement of further design activities.	C	X	
d. Foundation Investigation Request Initiate the foundation investigation as early in the preliminary design phase as is practical. On plan sheets showing the project control line, its stations and coordinates, utilities, identify the test holes needed and submit them to the project geologist. The available general layout information for the new structure shall be included in the investigation request.	C	X	
J. **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.	C	X	

	CDOT (C)/ Other*	Consultant	Not Applicable
K. **Preparation for the FIR**			
a. Coordinate, complete, and compile the plan inputs from other branches: materials, hydraulics, traffic, right-of-way, and Staff Bridge.	C	X	
b. If a major structure is included in the project, a general layout (which has been accepted by CDOT) will be included in the FIR plans.	C	X	
c. Prepare the preliminary cost estimate for the work described in the FIR plans base on estimated quantities.	C	X	
d. The FIR plans shall comply with CDOT requirements and shall include: title sheet, typical sections, general notes, plan/profile sheets, and preliminary layouts of interchanges/intersections. 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.	C	X	
i The following items will be mandatory for the FIR plans: *A Preliminary earthwork (plotted cross sections at critical points with roadway template and existing utility lines at known or estimated depths)* *B Catch points* *C Proposed Right-of-Way* *D Pit data (if required)* *E Soil profile and stabilization data* *F Structure general layouts (if applicable)*	C	X	
ii. Typical plan sheet scales will be as follows: *A Plan and Profile 1 inch = 50 Feet (Urban)* *1 inch = 100 Feet (Rural)* *B Intersections 1 inch = 20 feet*	C	X	
e. The ROW ownership map shall be included in the FIR plan set	C	X	
f. The plans shall be submitted to the CDOT/PM for a preliminary review prior to the FIR	C	X	
g. FIR plan reproduction not to exceed 20 sets	C	X	
h. The preliminary construction phasing including preliminary traffic control plan with proposed detours will be included in the FIR plan set	C	X	
i. CDOT form 1048 – project scoping procedures completion checklist	C	X	
L. **Field Inspection Review**			
a. Attend the FIR	C	X	
b. The FIR meeting minutes shall be prepared by the C/PM, approved by the CDOT/PM, and distributed as directed	C	X	
c. The FIR original plan sheets shall be revised/corrected in accordance with the FIR meeting comments within thirty (30) working days	C	X	
d. 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.	C	X	
e. A list of all deviations from standard design criteria along with the written justification for each one shall be submitted to the CDOT/PM	C	X	
M. **Post-FIR Revisions** The Consultant shall complete the revisions required by the FIR before this phase of work is	C	X	

	CDOT (C)/ Other*	Consultant	Not Applicable
considered to be complete			
N. **FINAL DESIGN**			
A. **Project Review**			
a. Update Project Schedule	C	X	
b. Coordinate Activities	C	X	
c. Finalize design decisions, variances, justification process, and traffic signal warrants	C	X	
B. **Roadway Design and Roadside Development**			
a. Roadway design. Prepare and provide final roadway design plans incorporating all input from applicable CDOT specialties and outside entities.	C	X	
b. Roadside design	C	X	
c. Landscaping	C	X	
i. Determine most economical alternative, finalize concept, and complete the plan.	C	X	
ii. Verify that an acceptable safe recovery distance exists between traveled way and all trees to be planted.	C	X	
iii. Coordinate special permits that may be required.	C	X	
iv. Verify availability of plant materials and submit letter to the CDOT/PM certifying that designated plants are available.	C	X	
b. Prepare and provide plans for sprinkler systems, bike paths, sound barriers, truck escape ramps, rest areas, and others, as appropriate.	C	X	
c. Lighting plans	C	X	
i. Provide a foundation investigation for each high mast light location.	C	X	
ii. After approval of the locations of the lights, the lighting design will be completed with the following information shown on the plan sheets: A Circuit type and voltage of power source B Location of power source (coordinated with the utility engineer) C Lumina ire type and lumens D Light standard type and mounting height E Bracket arm type and length F Foundation details G Size and location of electrical conduit H Locations of power sources(s)/lighting control center(s) (if appropriate) I Location of direct burial cable J Size of wiring and/or direct burial cable	C	X	
iii. Coordinate with local entities	C	X	
f. Prepare and provide wetland mitigation plan.	C	X	
C. **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 to identify and resolve any conflicts to finalize utility clearances.			
a. Prepare and provide final utility plans	C	X	
i. The final utility plans shall be prepared following the resolution of the FIR comments, the completion of the final hydraulic design, and the completion of the design of the other items in the list in paragraph (b) below.	C	X	
ii. The final utility plans shall include all horizontal and vertical locations of the existing and proposed utilities and any other details which would indicate	C	X	

	CDOT (C)/ Other*	Consultant	Not Applicable
possible utility conflicts.			
iii. The new or revised utility locations will be added to the plan topography. Conflicts will be resolved and appropriate pay items and specifications added, if required, to adjust utilities.	C	X	
b. Final railroad plans Coordinate the following activities through the Region Utility Engineer and in accordance with railroad requirements.			
i Develop the railroad encroachment plan (with cross sections)	C	X	
ii Define construction responsibilities between the railroad and highway	C	X	
iii Develop cost estimates based upon cost allocation previously determined	C	X	
iv Prepare Public Utilities Commission application exhibits as required.	C	X	
D. **Hydraulic Design**			
a Data Review Review data and information developed under the Preliminary Hydraulic Investigation and update in accordance with decisions made at the FIR.	C	X	
b. Storm Water Management Plan			
i. Update the Storm Water Management Plan in accordance with decisions made at the FIR and on additional investigation since the FIR.	C	X	
ii. Identify and incorporate MS4 requirements into the final plans.	C	X	
c. Major Structure Channel Design The final design shall include:	C	X	
i. The configuration, size and skew of the channel(s)	C	X	
ii. Water surface elevations	C	X	
iii. Elevations, flow lines and hydraulic information	C	X	
iv. Channel erosion protection limits for the structure(s)	C	X	
v. Recommend a low girder elevation for the selected structure(s)	C	X	
vi. Predict scour depth in the channel for the selected structure(s), and recommend mitigation measures	C	X	
d. Final Hydraulics Report			
i. Review and update the preliminary hydraulics report and provide 5 copies of the final hydraulics report containing all of the revisions	C	X	
ii. Bridge hydraulic information incorporated into the plan sheets	C	X	
E. **Right-of-Way Plans and Activities** Reference the CDOT ROW and surveying manual's requirements for the following:			
a Initiate ROW authorization process Coordinate with the CDOT/PM to initiate the ROW authorization process. Typically, the corrected FIR plans (with final hydraulic design inputs) will be used as the design basis for the ROW authorization plans.	C	X	
b. Ownership Maps	C	X	
c. Authorization Plan	C	X	
i. Integrate toes of slopes and other design details such as lane lines, culverts, road approaches, etc. into ownership map (base map for ROW plans)	C	X	
ii. Determine new Right-of-Way requirements, access control, and easements from design plans following the FIR and plot on ownership/base maps. Normal scale, 1"=50' in urban areas, 1"=100' in rural areas. Metric units may be required as per PM. Metric scales will be as shown in the CDOT "Metric Conversion Manual". Revise numbering of ownerships to correspond to ROW	C	X	

	CDOT (C)/ Other*	Consultant	Not Applicable
acquisitions.			
iii. Calculate areas of parcels, easements, and remainders	C	X	
iv. Prepare ROW plan sheets	C	X	
v. Prepare legal descriptions of parcels, easements and access control	C	X	
vi. Prepare tabulation of properties sheet	C	X	
vii. Prepare Right-of-Way Title Sheet	C	X	
viii. Incorporate the Control Survey and Monumentation Sheets into the plans	C	X	
ix. On the Monumentation Sheet, list the ROW, Easement, Control, etc., points to be set and the aliquot corners to be reset	C	X	
x. Prepare ROW tabulation of road approaches, if applicable. Show owner milepost/station, right or left of centerline, width of approach, skew angle, and any remark	C	X	
xi. Hold ROW Plan Review (ROWPR), with Design, ROW, and Construction to determine if ROW plans are sufficient to proceed with appraisal of property to be acquired for the project	C	X	
xii. Revise ROW plans after ROWPR and transmit originals of the plan sheets, title sheet, tabulation of properties sheet, and revised ownership (memoranda of ownership and title commitments as directed by the ROW manager), calculations and supporting data (i.e., parcel diaries), and final electronic data for all work products.	C	X	
d. Right-of-Way Plan Revisions Revise the ROW plans as needed through out the appraisal and negotiation process for those changes approved by the Region ROW Supervisor. All plan revisions shall be submitted to the Region ROW Supervisor within 5 working days after receiving notice from CDOT to proceed with a Plan Revision.	C	X	
e. Final ROW Plans and Monumentation	C	X	
f. Appraisals	C	X	
g. Appraisal staking Stake the proposed ROW line, easements and existing ROW line, if required by the region supervisor. Set lath or wooden stakes at all angle points and on line as necessary to have at least three stakes visible from any point on line. Mark point numbers on all stakes and color code as required. The appraisal stakes only need to be set at an accuracy of +/- 1.0 foot, unless the point fall near improvements, then +/- 0.25 foot is necessary.	C	X	
h. Acquire needed parcels including title insurance and closing services coordinated with the Region ROW Manager	C	X	
F. Materials Engineering			
a. Finalize and provide the stabilization plan/pavement design report.	C	X	
b. Finalize geotechnical considerations and incorporate them into the plans.			
i. Rock fall	C	X	
ii. Rock cut	C	X	
iii. Landslides	C	X	
iv. Other	C	X	
G. Traffic Engineering			
a. Prepare and provide permanent signing/pavement marking plans	C	X	
b. Signalized intersections:			
c. Prepare and provide the signal warrant study	C	X	

	CDOT (C)/ Other*	Consultant	Not Applicable
i Prepare plan sheet with intersection condition diagrams and required traffic signal design and forward to appropriate agency. Prepare 1 inch to 20 foot scale intersection plan sheet for each intersection which will have a traffic signal designed for it.	C	X	
ii) Prepare and provide the construction traffic control plans and quantities	C	X	
iii) Coordination with local agencies with landscape design and all associated permits (including A-line crossing)	C	X	
iv) ITS design plans	C	X	
v) Detour desgin	C	X	
H. Final Major Structural Design During the conduct of this activity the Consultant shall participate in structural review meetings with the CDOT Structural Reviewer.			
a. Structure final design			
i. Perform the structural analysis. Provide superstructure design, substructure design and document the design with design notes, detail notes, and computer outputs.	C	X	
ii. Perform final design check from design and detail notes.	C	X	
b. Preparation of structure plans and specifications Prepare and provide the Structural Plans and Specifications, including any revisions identified during the independent check.	C	X	
c. Independent design, detail and quantity check	C	X	
d. Prepare and provide the bridge rating and field packages	C	X	
I. **Construction Phasing Plan** A final construction phasing plan will be developed 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	
J. **Obtain Permits** This activity is concurrent with final design and must be completed prior to the advertisement for construction. Coordinate between the agencies, the Region Environmental Manager and the CDOT/PM and prepare and submit application and design information to the Region Environmental Manager for the following permits:			
a. 401 Permit Process (Water Quality Certification)	C	X	
b. 402 Permit Process (Point Source Discharge)	C	X	
c. 404 Permit Process (Individual Dredge and Fill)			
i. Determine impacts	C	X	
ii. Coordinate with the U.S. Army Corps of Engineers, Region and Staff Design	C	X	
iii. Incorporate permit stipulations into the final plans	C	X	
d. Wildlife Certification	C	X	
e. NPDES Storm Water Permit for Construction Activities	C	X	
K. **Plan Preparation for the Final Office Review**			
a. Coordinate the packaging of the plans	C	X	
i. Collect plans from all design elements and collate the plan package. Include all items listed in the Project Development Manual.	C	X	
ii. Calculate plan quantities and prepare the tabulations and Summary of	C	X	

	CDOT (C)/ Other*	Consultant	Not Applicable
Approximate Quantities.			
b. In addition to the plan sheets, the special provisions shall be provided. 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.	C	X	
c. Prepare FOR Estimate. Item numbers, descriptions, units and quantities shall be listed and submitted to the CDOT/PM.	C	X	
d. Submit the FOR Plans and specifications (Originals) to the CDOT/PM for a preliminary review prior to the FOR.	C	X	
e. FOR plan reproduction not to exceed **20** sets	C	X	
L. **Final Office Review**			
a. Attend the FOR	C	X	
b. The FOR meeting minutes shall be prepared, approved, and distributed within two weeks of the meeting as directed.	C	X	
c. The FOR original plan sheets and the specifications shall be revised in accordance with the FOR meeting comments and submitted to the CDOT/PM within four (4) weeks after the FOR.	C	X	
d. Submit the final revision of the plans after CDOT review.	C	X	
M. **Construction Plan Package** The bid plan 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.			
a. Electronic and hard copies of the following:			
i Roadway A Horizontal and vertical data B Staking data C Earthwork quantities D Cross sections	C	X	
ii. Major structures An independent set of the following shall be submitted to the CDOT Structural Reviewer for each major structure. A Structure grades B Structure geometry	C	X	
b. Final engineering package. The consultant shall submit copies, in 3-ring binders of the following:	C	X	
i. All project calculations or worksheets	C	X	
ii. All final reports and their approvals: Traffic, hydraulics, lighting, pavement design and economic analysis, geology foundation report, etc. All reports will have the latest revisions included.	C	X	
iii. Copies of variances, design decisions, and variance approvals	C	X	
iv. Project meeting minutes	C	X	
v. Utility clearance package	C	X	

	CDOT (C)/ Other*	Consultant	Not Applicable
Utility agreements and information regarding the utility location and clearance conditions			
vi. Maintain an environmental mitigation tracking tool for all environmental document commitments.	C	X	
vii. Bridge construction packet Includes bridge grades, geometry, and quantity calculations or worksheets	C	X	
viii. Any other information unique to this project and deemed important to the effectiveness of construction.	C	X	
c. Record plans sets Three (3) record plan sets for final design of roadways and structures will be produced which shall bear the seal and signature of the responsible Consultant Engineer on each sheet. One (1) set shall be retained by the Consultant for three (3) years. Two sets shall be submitted to CDOT. The original plan drawings shall not bear a seal.	C	X	
5. CORRIDOR MANAGEMENT SUPPORT			
A. **Design Control**			
a. Provide the required staff, communication equipment and computer systems with appropriate software for tracking and monitoring the planning efforts.	C	X	
b. Conduct periodic corridor progress meetings at an interval acceptable to the CDOT/PM. The following shall be reviewed:	C	X	
i. Activities complete since the last meeting	C	X	
ii. Problems encountered	C	X	
iii. Late activities	C	X	
ii Activities required by the next progress meeting	C	X	
iii Solutions for unresolved and anticipated problems	C	X	
iv Information or items required from other agencies	C	X	
c. Develop a quality assurance program that ensures correct error-free plans are produced by the project designers.	C	X	
d. The consultant shall coordinate the technical aspects of the planning efforts such as:	C	X	
i. Ensuring that the separate projects all utilize the same reference and data base for horizontal and vertical control.	C	X	
ii. Bearings, coordinates, grades and elevations are identical for common control lines on separate projects.	C	X	
iii. Earthwork balance is accomplished where appropriate	C	X	
B. Information Services			
a. Provide a management information system to monitor and report progress. This System will include a computer terminal and/or software for the CDOT/PM which the consultant shall furnish and maintain. This system will:			
i. Provide access to current project data and status (e.g., progress versus schedules and cost estimates versus budgeted funds)	C	X	
ii. Include the project schedules for submittals and key events	C	X	
iii. Identify progress with respect to the schedules	C	X	
iv. Identify critical path activities	C	X	
v. Provide upon demand the scheduled submittals/key events for designated time periods	C	X	
b. Produce and periodically update a strip map which outlines the entire corridor. The			

		CDOT (C)/ Other*	Consultant	Not Applicable
	Information Shown on this Map will Include the following:			
	i. Preliminary engineering project limits	C	X	
	ii. Construction project limits	C	X	
	iii. Construction project estimated costs	C	X	
	iv. Construction project Advertise-for-Bid (AD) dates	C	X	
	v. Other information that is considered appropriate	C	X	
C.	**Budget Planning Support**			
a.	Maintain a current file of project cost estimates. The date and type of each estimate will be identified.	C	X	
b.	Maintain a current file of existing and proposed funding for projects. Types of funding sources will be identified.	C	X	
c.	Develop a proposed ad schedule based on the estimated costs and the existing and anticipated future funding. The proposed ad schedule will be compared to the design schedule. Adjustments to the design and ad schedules may be made with CDOT concurrence.	C	X	
d.	A continuing evaluation of cash flow requirements and drawdown schedules administrative, preliminary engineering, right-of-way, utility, and construction costs will be accomplished. The funding requirements will be compared with the budget, also on a continuing basis. CDOT will be notified immediately of changes in funding requirements. (this will be completed when needed)	C	X	

SECTION 8
SERVICES AFTER DESIGN

Note: **The Consultant shall appoint a responsible member of the firm to be the contact person for all construction services. That person should be available until the end of construction to coordinate the following services.**

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 – None at time of contract. Others may be added as necessary based on work requirements.**

	CDOT (C)/ Other*	Consultant	Not Applicable
1. REVIEW OF SHOP DRAWINGS			
Review contractor shop and auxiliary drawings as directed by the CDOT/PM.	C	X	
A. **Maintain a log of all submittals which includes the following information:**			
a Submittal description	C	X	
b Date received	C	X	
c Date transmitted back to the sender	C	X	
B. **The review of submittals shall be done by a licensed professional engineer who is acceptable to the CDOT/PM.**	C	X	
C. **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.	C	X	
2. CONSTRUCTION SERVICES			
When requested by the appropriate Program Manager, the Consultant shall provide the services described below			
A. **Coordinate Schedule** Coordinate and evaluate contractor's construction schedule at start of construction and continuously throughout construction phase.	C	X	
B. **Provide field observation prior to, and on the day of, the following:**			
a Pile driving and/or caisson drilling	C	X	
b All major concrete pours	C	X	
c Placement of girders	C	X	
d Splicing of girders	C	X	
e Post-tensioning duct and anchorage placement	C	X	
f Post-tensioning operations	C	X	
C. **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:			

	CDOT (C)/ Other*	Consultant	Not Applicable
a Respond to questions in the field that arise relative to the plans, details or special provisions	C	X	
b Provide engineering and drafting services for design revisions required due to changes in construction or field conditions.	C	X	
c Review girder erection plan	C	X	
D. **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.	C	X	
b Documentation/justification - Changes/revisions/documentation justifying changes and/or revisions to plans and specifications	C	X	
c Progress reports - Monthly progress reports will be submitted for the Consultant's activities.	C	X	
d Calculations, drawings, and specifications as needed.	C	X	
e 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.	C	X	
3. 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.	C	X	
4. 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.	C	X	
B. **"As-Built" Plans** Modify the original plans so that the plans will agree with actual construction results.	C	X	
C. **Revisions to the Final Right-of-Way Plans** Review the final Right-of-Way line to identify any excess property due to construction changes. Prepare Final Plan Revisions, including legal Descriptions of excess property	C	X	
D. **Monument the Right-of-Way**			
a Reset all monuments referenced prior to construction that have been damaged or destroyed.	C	X	
b Reset any control monuments disturbed or destroyed by construction that are necessary to set Right-of-Way monuments.	C	X	
c Set all new Right-of-Way monuments as shown on final plans (or reference monuments, if necessary).	C	X	
E. **Set property corners on all remainder parcels** Required monumentation will be as directed by the CDOT/PM.	C	X	
F. **Deposit ROW Plans** A colored Record Plan Set updated of revisions and showing all monuments set subsequent to construction and showing recording information for the parcels, must be signed and sealed by the Professional Land Surveyor responsible for the work. The Record Set must be deposited in the appropriate county office in accordance with CRS 38-50-101 and CRS 38-51-107. Five (5) copies, One (1) color PDF file of complete sets and copies of the Microstation/InRoads files for the project of the deposited plan set must be delivered to the CDOT/PM.	C	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. Construction Services
D. Construction Engineering
E. Final Earthwork Determination
F. Completion of the "as-built" plans and/or final ROW plans

2. CONTRACT COMPLETION

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

A. Project Schedule
B. Project Progress Meeting Minutes
C. Traffic Control Plan(s)
D. All documents found In Research
E. All Permission to Enter Property forms
F. Monumented & Surveyed Ground Control Diagram(s)
G. Legally Deposited Control Survey Diagram(s)
H. Digital TMOSS Data
I. Photography Products
J. Ownership Map
K. Survey Report (including monument recovery forms)
L. Monumented and Sealed ROW Plans
M. Legally Deposited Survey Plans
N. Legal Descriptions (Signed and Sealed)
O. NOAA-NGS Blue Book
P. Completion of review of contract submittals
Q. Design Plans, Specifications, and Final Estimate
R. All Environmental Permits
S. All environmental, Utility and ROW Clearances
T. Hydraulic Report
U. Structural Report
V. Geotechnical Report
W. Materials Report

TABLE 1 – SUBMITTALS

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 – None at time of contract. Others may be added as necessary based on work requirements.**

TABLE 1…SUBMITTALS

Hard Copy	Electronic Copy		Project Initiation and Continuing Requirements	CDOT/OTHER	CONSULTANT
	PDF	Orig.			
X	X	X	Periodic Reports		X
X	X		Billings		X
X	X	X	Meeting Minutes		X
X	X		Project Schedule	C	X
X	X	X	Completed Specific Design Criteria	C	X
X	X		Survey Plan	C	X
X	X		Approved MHT's	C	X
X	X		Traffic Control Supervisor Certification	C	X
X	X		Permissions to Enter	C	X
		X	Initial Submittal of TMOSS (?) and or MOSS Compatible Data	C	X
X	X	X	Initial Submittal of an Original Plan Sheet	C	X
			Project Development		
X	X	X	Public Communication Contact List		X
			Route Location Survey		
X	X		Traffic Control Supervisor Certification	C	X
X	X		Approved MHT's	C	X
		X	Survey data in raw, unedited formats	C	X
X		X	Pothole data including invert elevations	C	X
X	X		Culverts report	C	X
X	X		Access report	C	X
X	X		Topographic survey notes	C	X
X	X	X	Contour plan checked for errors	C	X
X	X	X	Survey control diagram	C	
X			Field books	C	X
		X	Electronic Survey Files	C	X
		X	Survey TMOSS Data	C	X
X		X	Monument Records	C	X
X	X	X	Control & Monumentation Plan Sheets	C	X
X	X		Aerial Photography Index Map Sheets		X
X	X		Aerial Photography Contact Sheets		X
			Permits		
X	X		401 Permit	C	
X	X		Dewatering / 402 Permit	C	

Table 1...SUBMITTALS (CONT.)

Hard Copy	Electronic Copy		PRELIMINARY DESIGN (CONT.)	CDOT/OTHER	CONSULTANT
	PDF	Orig.			
X	X		404 Permit	C	
X	X		SB 40 Permit	C	
X	X		Wildlife Certification	C	
X	X		CDPS Storm Water Permit	C	
X	X		CDPHE Discharge Permit	C	
			Preliminary Design		
		X	Electronic Survey Data	C	X
X	X		Traffic Data & Recommendations	C	X
X	X		Geology & Soils Investigation Report	C	X
X	X		Pavement Design Report	C	X
X	X		Existing Bridge Condition Report	C	X
X	X		Foundation Investigation Report	C	X
X	X		Engineering Geology Plan Sheet(s)	C	X
X	X	X	Preliminary Hydraulics & Hydrology Report	C	X
X	X	X	Preliminary Storm Water Management Plan	C	X
X	X		Utility Relocation Recommendations	C	X
X	X	X	Ditch Structure Plans	C	X
X	X	X	Stabilization Plans	C	X
X	X		Structural Selection Report	C	X
X	X		Foundation Investigation Request	C	X
X	X		Final Materials Recommendations	C	X
X	X		Final Pavement Selection Report	C	X
X	X		Intersection Traffic Report	C	X
X	X		Traffic Report	C	X
X	X		Preliminary Cost Estimate	C	X
X	X	X	FIR Plan Set	C	X
X	X		List of deviations from Standard Design Criteria	C	X
X	X	X	Corrected FIR Plan Set	C	X
X	X		Final Hydraulics & Hydrology Report	C	X
			Preliminary Right-of-way		
X	X	X	Preliminary Ownership Map	C	X
X	X	X	Memorandum of Ownership	C	X
			Final Design		
X	X	X	Final Utility Plan Set	C	X
X	X	X	Final Railroad Plan Set	C	X
X	X		PUC Exhibit	C	
X			Bound Final Geotechnical Report _____ copies	C	X
X	X		Correspondence with Agencies, Entities, and Public	C	X
			Right-of-way		
X	X		Area Calculations	C	X
X	X	X	ROW Authorization Plans		
X	X		Legal Descriptions	C	X
X	X	X	Final Right-of-way Ownership Map	C	X
			Traffic Engineering		
X	X		Safety Assessment	C	X
X	X	X	Signing/Pavement Marking Plans	C	X

Table 1...SUBMITTALS (CONT.)

Hard Copy	Electronic Copy		Traffic Engineering (Cont.)	CDOT/OTHER	CONSULTANT
	PDF	Orig.			
X	X		Signal Warrant Study	C	X
X	X	X	Signalized Intersection Plans & Specifications	C	X
X	X	X	Traffic Control Plan	C	X
			Roadside Planning		
X	X	X	Landscape Plan & Specifications	C	X
X	X		Certification of Plant Availability	C	X
X	X	X	Irrigation Plans & Specifications	C	X
X	X	X	Bike path Plans & Specifications	C	X
X	X	X	Sound Barrier Plans & Specifications	C	X
X	X	X	Truck Escape Ramp Plans & Specifications	C	X
X	X	X	Rest Area Plans & Specifications	C	X
X	X	X	Lighting Plans & Specifications	C	X
X	X	X	Structure Final Review Plans & Specifications	C	X
X	X	X	Construction Phasing Plan	C	X
X	X	X	Storm Water Management Plan	C	
X	X	X	FOR Plans & Specifications	C	X
X	X	X	FOR Cost Estimate	C	X
X	X	X	Final Review Revisions	C	X
			Construction Plan Package		
X	X	X	Final Plans (11X17), Specifications (duplex) & Estimate Package for Ad.	C	X
X	X	X	Final Cross Sections	C	X
X	X		Schedule of Quantities	C	X
X	X		Design Decisions	C	X
X	X		Variances	C	X
X	X		Findings In the Public Interest	C	X
		X	Original Surface Digital Terrain	C	
		X	Final Surface Digital Terrain Model	C	X
		X	Design Digital Terrain Model	C	X
X		X	Staking Data	C	X
X	X	X	Earthwork Quantities	C	X
X	X	X	Mass/Haul diagram	C	
X	X		Project Calculations (2 copies)	C	X
X	X		Worksheets (2 copies)	C	X
X	X		Design Notes	C	X
X	X		Independent Design Review Reports	C	X
X	X		Roadway Design Data Submittal	C	X
X	X		Major Structure Design Final Submittal	C	X
X	X		Bridge Construction Pack (Field Pack)	C	X
X	X		Record Plan Sets	C	X
X	X	X	Bridge Rating Package as per Staff Bridge Rating Manual Requirements	C	X
X	X	X	Bridge Certification Letter	C	X

APPENDIX A
REFERENCES

1 **AMERICAN ASSOCIATON OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO) PUBLICATIONS** (using latest approved versions):

A. A Policy on Design Standards-Interstate System

B. A Policy on Geometric Design of Highways and Streets

C. Guide for Design of Pavement Structures

D. Standard Specifications for Highway Bridges

E. Guide for the Design of High Occupancy Vehicle and Public Transfer Facilities

F. Guide for the Development of Bicycle Facilities

G. Standard Specifications for Transportation Materials and Methods of Sampling and Testing – Part 1, Specifications and Part II, Tests

H. Highway Design and Operational Practices Related to Highway Safety

I. Roadside Design Guide

J. 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** (using latest 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. 501.2	Cooperative Storm Drainage System
E.	No. 514.1	Field Inspection Review (FIR)
F.	No. 516.1	Final Office Review (FOR)
G.	No. 1217a	Survey Request
H.	No. 1304.1	Right-of-Way Plan Revisions
I.	No. 1305.1	Land Surveys
J.	No. 1601.1	Interchange Approval Process
K.	No. 1700.1	Certification Acceptance (CA) Procedures for Location and Design Approval
L.	No. 1700.3	Plans, Specifications and Estimates (PS&E) and Authorization to Advertise for Bids under Certifications Acceptance (CA)
M.	No. 1700.5	Local Entity/State Contracts and Local Entity/Consultant Contracts and Local Entity/R.R. Contracts under C.A
N.	No. 1700.6	Railroad/Highway Contracts (Under Certification Acceptance)
O.	No. 1905.1	Preparation of Plans and Specifications for Structures prepared by Staff Bridge Branch

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

5 **LOCAL AREA**:

A. Manual for Railway Engineering

B. Any appropriate local agencies references as appropriate

APPENDIX B
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 – [YES OR NO]

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 C
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	CBC-	Concrete Box Culvert
13	CDOT-	Colorado Department of Transportation
14	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)
15	CDOT/STR-	Colorado Department of Transportation Structure Reviewer – The CDOT Engineer responsible for reviewing and coordinating major structural design
16	CDPHE-	Colorado Department of Public Health and Environment
17	CEQ-	Council on Environmental Quality
18	COG-	Council of Governments
19	COGO-	Coordinate Geometry Output
20	CONSULTANT-	Consultant for this project
21	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).
22 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.
23 DEIS-	Draft Environmental Impact Statement
24 DHV-	Future Design Hourly Volume (two-way unless specified otherwise)
25 DRCOG-	Denver Regional Council of Governments
26 D&RGW-	Denver & Rio Grande Western Railroad
27 EA-	Environmental Assessment
28 EIS-	Environmental Impact Statement
29 ESAL-	Equivalent Single Axle Load
30 ESE-	Economic, Social and Environmental
31 FEIS-	Final Environmental Impact Statement
32 FEMA-	Federal Emergency Management Agency
33 FHPG-	Federal Aid Highway Policy Guide
34 FHWA-	Federal Highway Administration
35 FIPI-	Finding In Public Interest
36 FIR-	Field Inspection Review
37 FONSI-	Finding of No Significant Impact
38 FOR-	Final Office Review
39 GPS-	Global Positioning System
40 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.

41	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).
42	MS4-	Municipal Separate Storm Sewer System
43	NEPA-	National Environmental Policy Act
44	NGS-	National Geodetic Survey
45	NICET-	National Institute for Certification in Technology
46	NOAA-	National Oceanic and Atmospheric Administration
47	PAPER SIZES-	See Computer-Aided Drafting Manual (CDOT); Table 6-13 and Table 8-1
48	PE-	Professional Engineer registered in Colorado
49	PM-	Program Manager
50	PLS-	Professional Land Surveyor registered in Colorado
51	PRT-	Project Review Team
52	PS&E-	Plans, Specifications and Estimate
53	PROJECT-	The work defined by this scope
54	ROR-	Region Office Review
55	ROW-	Right-of-Way: A general term denoting land, property, or interest therein, usually in a strip acquired for or devoted to a highway
56	ROWPR-	Right-of-Way Plan Review
57	RTD-	Regional Transportation Director
58	T/E-	Threatened and/or Endangered Species
59	SH-	State Highway Numbers
60	TMOSS-	Terrain Modeling Survey System
61	TOPOGRAPHY-	In the context of CDOT plans, topography normally refers to existing cultural or man-made details.
62	UDFCD-	Urban Drainage and Flood Control District
63	USACE-	United States Army Corp of Engineers