

## SCOPE OF WORK BASIC CONTRACT

### CONTRACT TYPE

Specific Rate of Pay   
Cost Plus Fixed Fee   
Other

CONTRACT DATE: \_\_\_\_\_

PROJECT NUMBER: STU 2706-043

PROJECT LOCATION: I-270 from I-76 to I-70

PROJECT CODE: 23198

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 NEPA ENVIRONMENTAL WORK TASK DESCRIPTIONS  
SECTION 7 PRECONSTRUCTION WORK TASK DESCRIPTIONS  
SECTION 8 CONTRACT CONCLUSION (CHECKLIST)  
APPENDICES

Comments regarding this scope may be directed to:

**COLORADO DEPARTMENT OF TRANSPORTATION  
REGION 1, NORTH PROGRAM ENGINEERING**

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# TABLE OF CONTENTS

Page

## 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.....11
3. DEVELOP A PROJECT SCHEDULE AND ASSIGN TASKS.....11
4. QUALITY ASSURANCE/QUALITY CONTROL (QA/QC).....11
5. OBTAIN NECESSARY RIGHT-OF-ENTRY AND PERMITS.....11

## SECTION 6

**NEPA ENVIRONMENTAL WORK TASK DESCRIPTIONS .....12**

1. CONSULTANT DISCLOSURE STATEMENT .....12
2. PROJECT INITIATION.....12
3. NEPA ENVIRONMENTAL ANALYSIS AND DOCUMENTATION.....13
4. COST ESTIMATES AND FINANCIAL ANALYSIS.....14
5. DATA COLLECTION, FIELD INVESTIGATION, MITIGATION MEASURES.....14
6. DELIVERABLES.....22
7. PUBLIC AND AGENCY INVOLVEMENT .....22
8. NEPA DOCUMENTATION PROCESS .....23

## SECTION 7

**PRECONSTRUCTION WORK TASK DESCRIPTIONS .....27**

1. PROJECT INITIATION AND CONTINUING REQUIREMENTS.....27
2. PROJECT DEVELOPMENT .....28
3. DESIGN.....28

## SECTION 8

**CONTRACT CONCLUSION (CHECKLIST).....35**

## APPENDICES

- APPENDIX A - REFERENCES
- APPENDIX B - SPECIFIC DESIGN CRITERIA
- APPENDIX C - DEFINITIONS

## SECTION 1 PROJECT SPECIFIC INFORMATION

### 1. PROJECT BACKGROUND

Interstate I-270 is a 6 mile-long controlled-access interstate highway with two through lanes in each direction providing a direct connection from I-25 to I-70 between the northern and eastern Denver metro communities. I-270 is a key link to the Denver International Airport and large business clusters from the energy, manufacturing, and logistics sectors. The highway infrastructure fails to meet local and regional transportation demands. Daily traffic congestion patterns begin on I-270 earlier than any other freeway in Colorado. Several interchanges and bridges were designed over 50 years ago, and portions of the pavement continue to sink above a large historic landfill. Business growth in the area has produced high volumes of large trucks which rely upon I-270 for access to and through the area. The Denver Regional Council of Governments (DRCOG) 2040 plan includes widening of I-270 from 4 to 6 lanes.

The I-270 pre-construction project work listed below has been completed in advance of the EA and shall be analyzed, leveraged, and incorporated in support of the EA:

- I-270 Geotechnical Historical Information
- 2019 I-270 TMOSS Topographic Lidar/Aerial Survey & Preliminary Ownership Map
- 2019 I-270 Traffic Model & Mainline Alternative Analysis
- 2019 Preliminary Corridor Modified Environmental Site Assessment – 270 corridor
- 2019 I-270 Historic Inventory

These and other relevant documents are available for reference via the RFP website.

### 2. PROJECT GOALS

- Safety
  - Improve the safety of all travelers in the corridor fully supporting CDOT's strategy Whole System. Whole Safety. *Bringing everyone home safely.*
- System Functionality
  - Produce a project that is consistent with the vision and commitments in place from surrounding planning and studies.
  - Deliver a project that is consistent with and building upon other CDOT endeavors including system management, corridor management, and technology initiatives.
  - Evaluate accommodation of emerging vehicle-to-infrastructure technology and connected vehicles.
- Schedule
  - With the goal to construct improvements as soon as possible, incorporate previous work as listed in Section 1.1 Project Background and accelerate environmental processes to quickly obtain a NEPA decision document.
- Environmental
  - Adhere to all environmental compliance requirements and regulations

- Implement innovative methods for environmental stewardship and community supported enhancements within the project scope, schedule, and budget
- Communication
  - Develop and execute a thoughtful and efficient communication plan showing how and when the stakeholders and public will be engaged in a manner that is effective and meets NEPA requirements.

The following draft Purpose and Need statements will be refined and confirmed with public and stakeholder input:

*The purpose of the I-270 project is to implement transportation solutions which modernize the I-270 corridor to accommodate present and future transportation demands.*

The following were identified as needs:

- Reduce the rate of vehicle crashes
- Improve connectivity\* for all modes of travel
- Accommodate increasing volumes of freight
- Improve travel time reliability

\*the terms *Access*, *Mobility* and *Connectivity* will need to be clearly defined when used in NEPA.

**3. PROJECT LIMITS**

The I-270 NEPA study includes Interstate I-270 in Adams County and Denver County from the I-76 interchange to its end at the I-70 Interchange.

**4. PROJECT COSTS**

The construction cost of improvements in this NEPA study is estimated between \$400M and \$500M.

**5. WORK DURATION**

The time period for the work described in this scope is estimated to begin in April 2020 and end in late 2021. Subsequent pre-construction task orders may be initiated (see Section 8.1 – Supplemental Work) which require additional time to complete; this contract end date shall be June 30, 2024.

**6. CONSULTANT RESPONSIBILITY AND DUTIES**

The Consultant is responsible for conducting project coordination, agency coordination, public participation, conceptual design and alternatives analysis, structure design, hydraulics, utility and traffic design, environmental and design data collection and analysis, environmental document requirement determination, preparation and submittal of an environmental assessment, and other tasks as described in the following sections.

CDOT roadway design staff will produce the conceptual roadway design alternatives with the support of the consultant, unless the consultant is directed to complete or finish portions of the design to accelerate the schedule or for other reasons as determined by CDOT.

**7. WORK PRODUCT**

The work in the scope of services for this project will be contracted on an individual Task Order basis, as needed and if needed as determined by the Department. The Department reserves the right to, at its sole discretion, decide to not issue task orders for any part of the work contained in this scope of services. The Consultant work products may include:

- A. Environmental Documents
- B. National Environmental Policy Act (NEPA) Report(s) - Technical summary of the engineering and environmental considerations, assumptions, analysis methodologies, and graphic displays of the recommended alternative(s).
- C. Project Coordination
- D. Schedules
- E. Meeting Minutes, Monthly project update report, record of decisions of each meeting
- F. Conceptual (15%) design plans and engineer's estimate.
- G. Other potential pre-construction Task Orders for work including but not limited to the list provided in *Section 8.1 – Supplemental Work*

The design level for the EA will be conceptual (15%) except in locations as directed by CDOT, such as interchanges or water quality ponds, where preliminary (30%) design may be needed to clearly identify environmental impacts of the preferred alternative.

Requirements are further described in the sections that follow.

## **8. WORK PRODUCT COMPLETION**

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

## **9. ADDITIONAL PROJECT INFORMATION**

Studies and projects which may influence this EA and/or I-270 corridor development are listed below:

- 2009 US 36 Environmental Impact Statement and Record of Decision (does not include managed lane direct connects to I-270)  
<https://www.codot.gov/projects/archived-project-sites/us36eis/documents>
- 2011 North I-25 EIS
- 2013 I-25 N. PEL from US36 to SH7
- 2014 RTD North Area Mobility Study (NAMS)
- 2014 TIGER grant application for I-270 corridor PEL study (not granted, use as a reference)
- 2016 CDOT Safety Assessment Report for Vasquez PEL
- 2016 Muller Traffic Study for Vasquez PEL
- 2017 I-70 Central Final Environmental Impact Statement and Record of Decision  
<https://www.codot.gov/projects/i70east/projects/i70east/report-and-project-history>
- 2018 Vasquez PEL study (Vasquez interchange alternatives)
- 2018 Commerce City North Metropolitan Industrial Area Connectivity Study  
<http://capitalprojects.c3gov.com/home/showdocument?id=6714>
- 2019 I-25 EA from US36 to 104th
- 2019 HPTE/CDOT Express Lanes Master Plan
- Ongoing Adams County York Street Phase III design
- Ongoing CDOT Vasquez Bridge E-17-AT over Sand Creek rehabilitation study
- Planned future I-25 bi-directional express lanes

## **SECTION 2 PROJECT MANAGEMENT AND COORDINATION**

### **1. CDOT CONTACT**

The Contract Administrator and Lead Project Manager for this project is:

Adam Parks, P.E.  
Region 1 North Engineering Resident Engineer  
4670 Holly St.  
Denver, CO 80216  
303-318-6732

Active day-to-day administration of the contract will be delegated to the CDOT Deputy Project Manager:

Ethan Jacobs, EIT III  
4670 Holly Street  
Denver, CO 80216  
303-398-6716

### **2. PROJECT COORDINATION**

Coordination will be required with the following at a minimum:

- A. CDOT North Program Engineering, R1 Environmental and all specialty groups
- B. HPTE (CDOT High Performance Transportation Enterprise)
- C. Cities: City & County of Denver, Commerce City
- D. Counties: Adams County, City & County of Denver
- E. Railroads: Union Pacific Railroad, BNSF Railway
- F. Regional Transportation District (RTD)
- G. Denver Regional Council of Governments (DRCOG)
- H. Metropolitan Planning Organizations (MPO's)
- I. U.S. Army Corps of Engineers (USACE)
- J. Mile High Flood District (MHFD)
- K. Federal Emergency Management Agency (FEMA)
- L. Colorado Parks and Wildlife (CPW)
- M. Environmental Protection Agency (EPA)
- N. U.S. Fish and Wildlife Service (USFWS)
- O. Federal Highway Administration (FHWA)
- P. State Historic Preservation Officer (SHPO)
- Q. Utilities
- R. Colorado Department of Public Health and Environment (CDPHE)
- S. Burlington Ditch Company
- T. Colorado Motor Carriers Association (CMCA)

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 will be coordinated with CDOT.

## **SECTION 3 EXISTING FEATURES**

### **1. STRUCTURES**

E-17-IC	York Street
E-17-ID	South Platte River
E-17-IE	South Platte River
E-17-IF	Burlington Ditch
E-17-IG	Burlington Ditch
E-17-IH	UPRR/BNSF/60th/Brighton Blvd
E-17-II	UPRR/BNSF/60th/Brighton Blvd
E-17-IJ	UPRR/BNSF
E-17-IK	UPRR/BNSF
E-17-WZ	Vasquez Blvd.
E-17-IN	56th/Dahlia
E-17-IO	56th/Dahlia
E-17-KQ	SH-35 Quebec Street
E-17-AT	Vasquez Blvd. over Sand Creek

### **2. WATERWAYS AND IRRIGATION DITCHES**

- South Platte River
- Sand Creek
- Big Burlington Ditch, owned by FRICO

### **3. RAILROADS**

- Union Pacific Railroad
- BNSF Railway

### **4. HAZARDOUS MATERIALS**

- See 2019 Preliminary Modified Environmental Site Assessment – 270 Corridor Project

**Note: The above is a list of the known features in this area. It is not to be considered as complete. The consultant should be alert to the existence of other possible conflicts.**

## **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 a written synopsis or copy of their respective contacts by telephone and in person with others and 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 person on the Consultant team that is qualified and has specific expertise in that task. 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. Design of any special project features must be directed, completed, and overseen by a professional engineer with significant experience in design of those special project features.

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: Civil Engineering, Electrical Engineering, Environmental Engineering, Geotechnical Engineering, Highway & Street Design, Hydrology and Hydraulics (including

PWQ), Management (Contract Admin), Structural Engineering, Transportation Engineering, Traffic Engineering.

It is the intent of CDOT that all key personnel be engaged to perform their specialty for all services required by this contract, and that the Consultant's key personnel be retained for the life of this contract to the extent practicable and to the extent that such services maximize the quality of work.

If the Consultant or a subconsultant decides to replace any of its key personnel, the Consultant shall notify the Project Manager in writing of the desired change. No such changes shall be made until at least two qualified replacement candidates are recommended by the Consultant and a replacement is approved in writing by the Project Manager. The Project Manager's approval shall not be unreasonably withheld. Failure of the Consultant to comply with the requirements of this provision may be the basis for CDOT's termination of this contract. The Project Manager shall respond to the Consultant's written notice regarding replacement of key personnel within fifteen working days after the Project Manager receives the list of proposed changes. If the Project Manager or its designated representative does not respond within that time, the listed changes shall be deemed to be approved. If during the term of the contract the Project Manager determines that the performance of approved key personnel is not acceptable, he shall notify the Consultant and give the Consultant the time which the Project Manager considers reasonable to correct such performance. Thereafter he may require the Consultant to reassign or replace such key personnel. If the Project Manager notifies the Consultant that certain of their key personnel or the key personnel of a subconsultant should be replaced, the Consultant shall use its best efforts to replace such key personnel within a reasonable time, not to exceed thirty calendar days from the date of the Project Manager's notice.

## **5. CDOT COMPUTER/SOFTWARE INFORMATION**

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

- |                          |  |
|--------------------------|--|
| 1. Drafting/CADD         | Bentley Microstation and ORD (CDOT configuration).       |
| 2. Earthwork             | Bentley InRoads and ORD ConceptStation                   |
| 3. Materials             | AASHTOWare Pavement ME Design software                   |
| 4. Traffic               | TransModeler   |
| 5. Survey/photogrammetry | CDOT TMOSS, InRoads, Trimble Business Center (TBC)       |
| 6. Bridge check          | Bridge software as listed in the Bridge Design Manual    |
| 7. Estimating            | Transport (an AASHTO sponsored software) as used by CDOT |
| 8. Specifications        | Microsoft Word   |
| 9. Scheduling            | Microsoft Project  |
| 10. Water Quality Data   | ArcView  |

## **6. ELECTRONIC SUBMITTALS**

Bentley ProjectWise is the official electronic archive for CDOT projects. Project submittals and all relevant documents shall be uploaded to the appropriate CDOT ProjectWise project folder by the consultant. 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.

## **7. PROJECT DESIGN DATA AND STANDARDS**

- A. General:  
Appendix A provides a comprehensive list of state and federal reference material. 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.

**SECTION 5  
PROJECT INITIATION AND CONTINUING REQUIREMENTS**

	CDOT (C)/ Other*	Consultant	Not Applicable
<p><b>1. PROJECT MEETINGS</b> Project meetings shall be conducted by the Consultant. 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.</p>		X	
<p><b>A. Initial Project Meeting</b> 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.</p>	C	X	
<p><b>B. Progress Meetings</b> 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.</p>	C	X	
<p><b>C. Public Meetings</b> The Consultant shall provide the presentation aids, and help conduct the meeting.</p>		X	
<p>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.</p>	C	X	
<p>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.</p>	C	X	
<p>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”.</p>	C	X	
<p><b>D. Meeting Minutes</b> 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. When a decision has been made during a meeting, it will be marked “Decisions Made” for posterity.</p>		X	
<p><b>E. Contact List</b> Establish and maintain a computerized list of all appropriate interested parties for the communication process.</p>		X	

	CDOT (C)/ Other*	Consultant	Not Applicable
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 Irrigation Ditches ix Media Contacts		X	
<b>F. Public Notices/Advertisements</b> Publicize the proposed project in accordance with the CDOT policies and procedures. Copies of the publication shall also be mailed to the individuals on the “contact list”.		X	
<b>G. Communication Aids</b>			
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.		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.		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.			N/A
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
<p><b>2. PROJECT MANAGEMENT</b> 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. The Consultant shall coordinate all the work tasks being accomplished by all parties to ensure project work completion stages are on schedule.</p>		X	
<p><b>3. DEVELOP A PROJECT SCHEDULE AND ASSIGN TASKS</b> 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.</p>		X	
<p><b>4. QUALITY ASSURANCE/QUALITY CONTROL (QA/QC)</b> 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.</p>		X	
<p><b>5. OBTAIN NECESSARY RIGHT-OF-ENTRY AND PERMITS</b> 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.</p>		X	
<p><b>A. Signature Copies</b> 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.</p>		X	
<p><b>B. Permits</b> 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. Permits are to include any ditches and railroads.</p>		X	

**SECTION 6  
NEPA ENVIRONMENTAL WORK TASK DESCRIPTIONS**

	CDOT (C)/ Other*	Consultant	Not Applicable
<b>1. CONSULTANT DISCLOSURE STATEMENT</b>			
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.		X	
<b>2. PROJECT INITIATION</b>			
<b>A. Environmental Scoping Task</b>			
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 Water Quality Specialist/Water Pollution Control Manager, and 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.		X	
<b>B. Review Applicable Existing Documents</b>			
Review and leverage data and information from project-specific documents (as noted in Section 1) 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 have been created by local planning agencies or municipalities.		X	
<b>C. Extent of Study Required for Resources</b>			
In conjunction with the Environmental PM, determine the extent of study required for each resource area.		X	
<b>D. Preparation and Coordination of Requirements</b>			
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	
<b>E. Project Study Area Limits/Logical Termini</b>			
Preliminary project study area limits are established in Section 1. 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.	C	X	

	CDOT (C)/ Other*	Consultant	Not Applicable
<p><b>F. Project File / Administrative Record</b>  Maintain a NEPA Project File that easily could transition to an 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.</p>		X	
<b>3. NEPA ENVIRONMENTAL ANALYSIS AND DOCUMENTATION</b>			
<p>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 all participating agencies for early review as appropriate and necessary.</p>		X	
<p><b>A. Purpose and Need</b>  Review and refine Draft Purpose and Need statement for approval by appropriate parties. The objectives of the project should be clearly identified and agreed upon early in the project process to prevent backtracking and limit schedule changes. Develop and refine, as necessary, to address information collected on the project during data collection, transportation analysis, and public and agency scoping and involvement. Review previously prepared studies to help direct Purpose and Need information as appropriate (e.g., local planning studies, engineering feasibility studies, etc.). Submit the Purpose and Need for review and approval by CDOT and FHWA.</p>		X	
<p><b>B. Alternatives Development and Evaluation</b>  Develop a limited number (as directed by CDOT) of reasonable alternatives that will satisfy the Purpose and Need requirements of the project, including, but not limited to, those identified in earlier and ongoing studies of the area. The Consultant team, in coordination with CDOT and FHWA, will determine the design year to use for the project. Changes in the design year during the project may be subject to a Scope of Work modification.</p>	C	X	
<p><b>C. Evaluate Alternatives Impacts</b>  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.</p>		X	

	CDOT (C)/ Other*	Consultant	Not Applicable
<b>D. Alternatives Screening Process</b> 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	
<b>4. COST ESTIMATES AND FINANCIAL ANALYSIS</b>			
<b>A. Develop Cost Estimates and Financial Analyses</b> 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.		X	
<b>B. Incorporate into NEPA Document</b> 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.		X	
<b>C. Preliminary Construction Cost Estimates</b> Prepare preliminary construction cost estimates based on conceptual design of alternatives identified during the NEPA process. Project right-of-way acquisition, SUE, 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.		X	
<b>5. DATA COLLECTION, FIELD INVESTIGATION, MITIGATION MEASURES</b>			
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		X	

	CDOT (C)/ Other*	Consultant	Not Applicable
level of environmental documentation (EA). It is expected that the level of detail for this NEPA document will be as appropriate for an EA using CDOT’s template EA. Use of Geographic Information Systems (GIS) 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.			
<b>A. Geospatial Data</b> Coordinate with applicable CDOT data managers (resource specialists, DTD GIS etc.) prior to initiating geospatial tasks and document path-forward decision in a brief Geospatial Data Memo. This should document at a minimum, expected feature datasets, attribute schemas, coordinate systems, deliverable formats, data hosting locations, and CDOT review timelines. The memo is intended to be brief. CDOT concurrence is required. Online geospatial data accessed and downloaded should be sourced from authoritative agencies only. All finalized data outputs for use in NEPA documentation are to be delivered to CDOT and stored for project record. All final deliverables will be reviewed by applicable CDOT data managers and determined to be sufficient prior to closing geospatial data tasks.		X	
<b>B. Air Quality</b> 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 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. Deliverables: Air Quality Technical Report		X	
<b>C. Water Quality</b>			
a Water resources in the project area are impaired for CDOT pollutants of concern. Investigate and document the status of the water resources (quality, etc.) for the purposes of describing the existing condition or “affected		X	

	CDOT (C)/ Other*	Consultant	Not Applicable
environment” before construction: groundwater/aquifers, lakes, rivers, streams, and springs, locations of drinking water treatment plants, Permanent Water Quality Control Measures and locations of sewage treatment facilities.			
b Investigate and document the impacts of the project to 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.).		X	
c Municipal Separate Storm Sewer System (MS4) will apply to this project. Determine the MS4, Colorado Discharge Permit System (CDPS), and design and permitting issues per the CDOT PWQ program.		X	
d Recommend appropriate Water Quality mitigation measures as necessary. A mitigation plan that includes conclusions of effects, permanent best management practices (BMPs), temporary/construction BMPs, erosion control measures, and definition of maintenance responsibilities.		X	
e Deliverable: Water Quality Technical Report		X	
<b>D. Floodplains Assessment</b>			
Identify location of regulatory floodplains and floodways published by FEMA and local agencies, and assess impacts of planned changes to those boundaries from CDOT activities or planned map revisions by others.		X	
a Add information to environmental resource mapping of existing conditions.		X	
b Determine the adverse impacts of each alternative with respect to the base flood elevation (BFE), floodway boundary, and local drainage. This must include the impacts of construction and other “temporary” activities.		X	
c 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).		X	
d Develop possible actions to mitigate for the adverse impacts and coordinate with roadway and structural designers.		X	
e. Deliverable: Prepare floodplain and drainage assessment information as outlined in the CDOT NEPA manual.		X	
<b>E. Wetlands Determination/Delineation:</b>			
a Conduct a field evaluation for the presence of wetlands within the project study area. Global Positioning System (GPS) should be used for this activity.		X	
i 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.		X	
ii Prepare wetlands maps that delineate the wetland boundaries within the corridor. GPS will be used for this mapping.		X	
iii Coordinate the findings with the CDOT Region and the USACE. Obtain jurisdictional determination of the wetlands from the USACE.		X	

	CDOT (C)/ Other*	Consultant	Not Applicable
iv Deliverable: inclusion in the Biological Resources Report			
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 and indicated in the EA.		X	
<b>F. Vegetation and Noxious Weeds</b>			
a. Investigate and document the status of 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.		X	
b. Investigate and document the impacts of the project, to vegetation habitat and noxious weeds during and following construction.		X	
c. Recommend appropriate vegetation habitat and noxious weed mitigation measures as necessary		X	
d. Deliverable: mapping of communities and write-up in Biological Resources Report		X	
<b>G. Fish and Wildlife</b>			
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.		X	
b. Coordination with the Colorado Parks and Wildlife (CPW) and US Fish and Wildlife Service (USFWS).		X	
c. Perform an impact analysis.		X	
d. Develop appropriate mitigation measures		X	
e. Deliverable: Biological Resources Report		X	
<b>H. Threatened and Endangered (T&amp;E) Species</b>			
a. Coordination with CPW, USFWS, and Colorado Natural Heritage Program (CNHP) requesting a T&E species list.		X	
b. Perform an impact analysis		X	
c. Identify impacts to species and recommend mitigation.		X	
d. Deliverable: Biological Resources Report		X	
<b>I. Historic Properties</b>			
a. Incorporate and leverage information from the Selective Historic Resources Inventory Report, I-270 Corridor (October 2019)		X	
b. Determine the area of potential effects (APE), in coordination with CDOT.	C	X	
c. Conduct a literature and records search for previously recorded historic resources in the APE at the OAHP.		X	
d. 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 using survey forms. Potential resources include man-made structures, ditches, railroads, etc. Includes historic research providing new		X	

	CDOT (C)/ Other*	Consultant	Not Applicable
survey form and using 20 survey forms already developed during early history work performed in late 2019.			
e Identify and coordinate with consulting parties (e.g., public, historic preservation groups, local historical societies, museums) regarding historic properties in the project area.		X	
f 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.		X	
g Determine potential impacts, both direct and indirect, to historic resources and recommend mitigation strategies to avoid, minimize, or mitigate impacts.		X	
h Prepare correspondence as necessary for the CDOT Region to submit to the SHPO.		X	
i Collaborate with the CDOT Region Historian to develop a Memorandum of Agreement, if necessary, with recommended mitigation strategies for adverse effects for agency review and execution.		X	
j Prepare Section 4(f) documents as required.		X	
k Work with the CDOT Region historian to obtain any necessary approvals.		X	
l All of the bridge structures identified in Section 3.1 are part of the interstate highway system and none are located in a nationally significant section of interstate. The bridges are exempt from Section 106 Historic Section 4(f) and Colorado State Register Act review.			N/A
<b>J. Archaeology</b>			
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	
a 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	
b Complete laboratory analyses of all collected artifacts and ancillary specimens.		X	
c Write a comprehensive survey report according to guidelines established by the OAHP.		X	
d Develop a data recovery plan to mitigate potential adverse effects to significant archaeological localities, as appropriate and necessary.		X	
e Coordinate the mitigation plan with the EPB Senior Staff Archaeologist, SHPO, and other required agencies.		X	
f Conduct data recovery excavations at any significant archaeological site that cannot be avoided during construction.		X	
g Analyze artifacts.		X	
h 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		
i Coordinate Tribal consultation and support EPB Senior Staff Archaeologist as needed.		X	
j Prepare Section 4(f) documents as required.		X	

	CDOT (C)/ Other*	Consultant	Not Applicable
<b>K. Paleontological Resources</b>	C		
a Perform a literature and museum fossil database search and field assessment			
b Determine the presence or absence of paleontological resources.	C		
c Conduct analysis to determine the scientific significance (research and/or educational value) of the resource.	C		
d Write the paleontological technical report, including mitigation proposals, if necessary. The assessment report will be provided to the project team for inclusion in the NEPA document.	C		
e Coordinate the mitigation plan with the EPB Staff Paleontologist.	C		
<b>L. Community Understanding Report</b> This technical report will combine the following resources into one technical report deliverable. <b>Land Use</b> 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. <b>Social and Economic Resources</b> 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.		X	
<b>M. Environmental Justice</b> 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, aesthetics, community cohesion, relocation impacts).			X

	CDOT (C)/ Other*	Consultant	Not Applicable
<b>N. Transportation Resources</b>		X	
a The results of the existing I-270 Traffic Model & Mainline Alternative Analysis, as well as any additional traffic analyses, will be portrayed in written format to satisfy NEPA requirements.		X	
b 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.		X	
c 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.		X	
<b>O. Section 4(f) and Section 6(f) Evaluation</b>			
a Inventory and map project area for Section 4(f) and/or 6(f) facilities	C		
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).	C		
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)	C		
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.	C		
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.	C		
f Prepare evaluation and coordinate reviews with RPEM and EPB staff for review by FHWA.	C		
<b>P. Noise</b>			
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.		X	
The analysis will consist of the following, each of which must be covered in the noise assessment document:		X	

	CDOT (C)/ Other*	Consultant	Not Applicable
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 same model year as the design year forecasted in the transportation model. 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	
<b>Q. Visual Resources</b> Using the new CDOT Visual Guidance, assume preparation of a Visual Impact Assessment Memo. This memo will identify one (1) landscape unit. Views to analyze will include: views to the road, tree mitigation plan, views of tolling signs, view headed northwest. Preparation of Corridor Guidelines. Coordinate the I-70 and I-25 Design Guidelines to create the I-270 Design Guidelines. Include Stapleton Design Guidelines, US 36 Guidelines and I-76 Guidelines for reference.  When specified, the following will be investigated: natural areas (e.g. scenic landscapes, 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	
<b>R. Hazardous Materials</b> Analyze, leverage, and incorporate results of regulatory research and records review, including the preliminary MESA (2019) 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 a Preliminary Materials Management Plan (MMP). Deliverables are to include the following.		X	
a. Amend or update the Preliminary MESA, identify how the presence of hazardous waste locations may impact each alternative, including the no-action alternative. GIS mapping will be desired.		X	
b. Conduct subsurface soil and groundwater collection and analysis to delineate horizontal and vertical extent of contaminated soil and groundwater and to determine level of contaminants in said media and compile information into a Phase II.		X	

	CDOT (C)/ Other*	Consultant	Not Applicable
a. Select locations for soil boring/monitoring wells based on information obtained from above research, geologic review, and alignment considerations. Conduct drilling activities to install monitoring wells and obtain soil and groundwater samples for chemical analysis as well as geotechnical and geologic data.		X	
b. Perform asbestos and lead based paint testing as determined appropriate.		X	
c. Prepare a Phase II based on data obtained from the above field investigation to assist with the alternatives screening process and provide data for the construction team.		X	
d. Evaluate the provided well survey data for the area and determine which wells can be sampled to assist with the above study and which wells will eventually need to be closed for the selected alternative.		X	
e. Prepare a Materials Management Plan (MMP) to discuss managing materials identified through the sampling in the Phase II.		X	
<b>S. Cumulative Impacts</b> 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	
<b>6. DELIVERABLES</b>			
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.			
Agency Coordination and Outreach Plan		X	
Purpose and Need Statement		X	
Environmental Assessment		X	
Technical Reports		X	
Decision Document		X	
<b>7. PUBLIC AND AGENCY INVOLVEMENT</b>			
This section identifies public and agency involvement tasks anticipated for the project.			
A. Develop an Agency Coordination Plan (required for an EIS, optional for an EA)		X	
B. Stakeholder Involvement Plan		X	

	CDOT (C)/ Other*	Consultant	Not Applicable
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.			
<b>8. NEPA DOCUMENTATION PROCESS</b>			
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.		X	
<b>A. Preliminary Data Submission</b> 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).			N/A
<b>B. Draft and Final NEPA Document Preparation</b> 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.		X	
Distribute the internal draft NEPA document and relevant technical reports for review to a distribution list specified by CDOT. Provide effort for no more than <b>3</b> review cycles of the draft NEPA document and relevant technical reports. Review cycles assume that QA/QC has been performed internally by the consulting firm prior to CDOT submittal. Coordinate and conduct no more than two comment resolution meetings for distribution list comments. Respond to comments within a reasonable number of working days after received.		X	
a It has been determined, and confirmed through consultation with FHWA, that this project should be scoped as a Template EA.	X		
b Determine review process to be used for the NEPA document.	C	X	
c Coordinate the impacts and mitigation measures with CDOT, and appropriate agencies, and FHWA. Take necessary actions to resolve issues.		X	
d Follow the prescribed Template EA outline		X	
e Prepare and provide to the CDOT Region up to 6 copies of the complete draft NEPA document and relevant technical reports [in paper format and also in electronic format]. Provide effort for no more than <b>1</b> 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 above may be combined.		X	
f Prepare and provide to CDOT EPB up to 6 copies of the complete draft NEPA document and relevant technical reports. Provide effort for no more than <b>1</b> review cycle of the draft NEPA document and relevant technical reports for CDOT EPB review. Coordinate and conduct no more than 1 comment resolution meetings for CDOT EPB comments.		X	

	CDOT (C)/ Other*	Consultant	Not Applicable
g Prepare and provide to FHWA Colorado Division and FHWA Legal up to 6 copies of the complete draft NEPA document and relevant technical reports. Provide effort for no more than 1 review cycle of the draft NEPA document and relevant technical reports for FHWA Colorado Division and FHWA Legal review. Coordinate and conduct no more than 1 comment resolution meetings for FHWA comments.		X	
h Distribute the draft NEPA document and relevant technical reports for review to a distribution list specified by CDOT. Prepare no more than 6 copies 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 cycle of the draft NEPA document and relevant technical reports. Coordinate and conduct no more than two comment resolution meetings for distribution list comments.		X	
i 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.		X	
j 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.		X	
k Submit the NEPA document to CDOT for signature and routing to FHWA for approval.	C	X	
l Draft NEPA Document Distribution, Advertising and Public Review, Review and Concurrence, and Public NEPA Document Availability and Advertisement		X	
Provide the following services in coordination with the CDOT Region:			
Create draft and final text for the public Notice of Availability of the NEPA document and the date, time and location of the public meeting/hearing [if appropriate for NEPA document] for placement in all appropriate local papers.		X	
a Follow the signature process outlined in the CDOT NEPA Manual.		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.		X	
c Compile public comments in determined format by CDOT/PM.		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.		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. Provide certification that all comments have been addressed. The Consultant shall submit a signature copy of the NEPA document and relevant technical reports [to CDOT] for signatures and routing to FHWA for approval, and then will provide copies of the signed final NEPA document to CDOT.		X	
<b>C. Public Meeting (Hearing if determined)</b>			
Provide the following services, in coordination with the CDOT Region and EPB:			

	CDOT (C)/ Other*	Consultant	Not Applicable
a Determine location for public meeting and ascertain that facilities are ADA compliant		X	
b Advertise the public hearing/meeting date and location. The following media will be used for advertisement: Select from the following or add others.		X	
c Hire translator, or sign language communicator, as needed		X	
d Provide audio/visual equipment and support for presentations, as needed		X	
e Provide a court reporter (if public hearing) and prepare a certified transcript of the public hearing within 5 working days after the public hearing and/or meeting			
f Prepare the graphics/display boards to display at meeting		X	
<b>D. Decision Document (FONSI/ROD) Preparation</b>			
There is no guarantee of the outcome of the NEPA process in order to determine next steps after an EA, and therefore a scope of work will be confirmed for the NEPA decision document. This scope of work and contract will be reevaluated once the preliminary EA process is complete and the lead agency has made a decision on how to proceed.			
a 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	
b 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 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:		X	
c 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.		X	
i Submit draft NEPA decision document (note how many copies: electronic vs. paper) and relevant supporting documentation to CDOT Region, EPB, and FHWA for 3 reviews.		X	
ii 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.		X	
iii If necessary, re-submit the draft NEPA decision document and relevant supporting documentation for review to ensure that all comments have been made.		X	
iv If necessary, modify the draft NEPA decision document and relevant supporting documentation to respond to comments received.		X	
v 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 6 hard copies and 1 electronic		X	

	CDOT (C)/ Other*	Consultant	Not Applicable
versions of the final NEPA decision document and relevant supporting documentation on compact disc.			
vi 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.		X	

**SECTION 7  
PRECONSTRUCTION WORK TASK DESCRIPTIONS**

	CDOT (C)/ Other*	Consultant	Not Applicable
<b>1. PROJECT INITIATION AND CONTINUING REQUIREMENTS</b>			
<b>A. Environmental Mitigation and Requirements</b> Ensure that any mitigation commitments within the NEPA documentation are incorporated into the project.		X	
<b>B. Independent Design Review</b> 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	
<b>C. Identify Design Criteria</b> Submit a copy of Appendix B -Specific Design Criteria with the appropriate items completed.		X	
<b>D. Initiate Survey</b> 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		
<b>E. Traffic Control</b> Consultant field activities that interfere with traffic operations within existing roadways will require control of traffic. The Consultant shall plan and provide any required traffic control for the survey, testing, or the design process. Traffic control operations will be in accordance with the MUTCD. The proposed Method for Handling Traffic (MHT) must be submitted to the CDOT/PM. Also, certification of the Traffic Control Supervisor as a Worksite Traffic Supervisor by the American Traffic Safety Services Association (ATSSA) or as a TCS (Traffic Control Supervisor) by the Colorado Contractors Association (CCA) shall be required.		X	
<b>F. Structure Review Meeting</b> While the major structural design work is progressing, the Consultant shall meet 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.		X	
<b>G. Initial Submittals</b> Submit the following samples to the CDOT/PM for approval:			
a An original plan sheet that complies with this scope of work		X	
b Photogrammetric and/or survey data and a drawing or photograph in accordance with the requirements specified in this scope of work	C		
<b>Note: No original plan sheets or photogrammetric survey work will be accomplished until satisfactory samples have been received and approved by the CDOT/PM.</b>			

	CDOT (C)/ Other*	Consultant	Not Applicable
<b>2. PROJECT DEVELOPMENT</b>			
<b>A. Survey</b> <i>Survey topography was completed prior to this contract and will be provided for use and supplemented as necessary in coordination with the survey consulting firm.</i>	C		
<b>3. DESIGN</b>			
<b>A. Traffic Engineering</b>			
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. Using the latest version of the Highway Safety Manual, conduct and document safety analyses based on accident data collected from local emergency services, Colorado State Patrol, and the CDOT Traffic Analysis Unit; evaluate traffic safety patterns and trends; produce Level of Service of Safety assessments; and document safety issues and possible treatments.		X	
b Utilize the 2019 I-270 Traffic Model & Mainline Alternative Analysis as a baseline for traffic projections along the corridor; determine the design year during the scoping process for the project. Forecasts should be based on existing roadways and roadways that are committed to be constructed (that is, “No Action”—those that will be constructed regardless of whether the project in question moves forward). 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.		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.		X	
d The proposed design shall be reviewed to ensure compatibility with existing signing procedures throughout the preliminary roadway design process		X	
e Use traffic data appropriate to the anticipated construction timing in developing detour alternatives.		X	
f Develop the total ESAL for the design life and submit to the CDOT/PM for the pavement design.		X	
g Submit the traffic data and recommendations to the CDOT/PM for review.		X	
<b>B. Materials Engineering</b>			
a Preliminary Soil Investigation (Pavement)			

	CDOT (C)/ Other*	Consultant	Not Applicable
i Determine test hole locations (horizontal and vertical) and coordinate with CDOT to finalize locations and testing protocol. A sufficient number of test holes shall be drilled in accordance with CDOT's sampling requirements. The soil shall be characterized to a depth in accordance with the Pavement Design Manual. Samples collected through existing pavement shall include thicknesses of pavement and base layers encountered. Base layers, if detected, shall be sampled and tested as soil samples. Soil will be evaluated as well in pavement samples using criteria from above. Drill hole locations shall be surveyed and included on the plans.		X	
<p><i>Classification/Gradation</i></p> <p><i>Moisture – Density Relationship</i></p> <p><i>Resistance Value (R-value AND k-value)</i></p> <p><i>Atterberg Limits (LL, PI, and PL)</i></p> <p><i>Corrosiveness</i></p> <p><i>(Includes pH, sulfates, chlorides, and resistivity in areas where pipes may be installed for the purposes of pipe selection. Per the CDOT Field Materials Manual, tests shall be conducted at each bore hole for each soil type encountered. Additional locations for corrosivity testing may be required to fulfill pipe material selection requirements. The roadway design team / hydraulics design team should be contacted prior to obtaining soil samples.)</i></p> <p><i>(see CDOT Pipe Material Selection Policy)</i></p> <p><i>Bearing Capacity</i></p> <p><i>Swell Potential / Consolidation</i></p> <p><i>Other tests specific to analysis for retaining wall investigation (per consultation with CDOT Geotechnical Staff)</i></p>		X	
ii Prepare and submit a draft soils investigation report which summarizes the results of the geotechnical survey and soil test results to be submitted to CDOT for review. Comments submitted by CDOT shall be addressed in detail and any required changes will be made to the draft report, from which a final report will be prepared.		X	
iii Prepare and submit pipe material selection report		X	
<b>C. Pavement</b>			
a Pavement Rehabilitation This section applies if the project includes existing pavement that is incorporated in the design for continued utilization. This work will be determined based on the design alternatives and through coordination with CDOT.		X	
i Determine the equivalent Design Traffic (18k ESAL) that the existing pavement can carry		X	

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

	CDOT (C)/ Other*	Consultant	Not Applicable
<ul style="list-style-type: none"> <li>ii Analyze life cycle cost of the selected alternatives <ul style="list-style-type: none"> <li>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.</li> <li>B Compare alternatives over the same life span.</li> <li>C Recommend the pavement structure and provide the basis for the recommendations.</li> </ul> </li> </ul>		X	
<ul style="list-style-type: none"> <li>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 review and comment for eventual acceptance.</li> </ul>		X	
<b>D. Hydrology/Hydraulics and Floodplain Management</b>			
<ul style="list-style-type: none"> <li>a Data Review</li> <li>b Review data and information developed under previous Hydraulics Reports, Drainage Reports, and/or Floodplain Reports.</li> </ul>		X	
<ul style="list-style-type: none"> <li>i Establish drainage basin data: delineate and determine size, waterway geometrics, vegetation cover and land use.</li> </ul>		X	
<ul style="list-style-type: none"> <li>ii Collect historical data; research flood history and previous designs in the project proximity; and obtain data from other sources (e.g., Mile High Flood District (MHFD), Colorado Water Conservation, CDOT Maintenance, and local residents).</li> </ul>		X	
<ul style="list-style-type: none"> <li>iii Select a design storm frequency based on the established criteria.</li> </ul>		X	
<ul style="list-style-type: none"> <li>iv Complete a hydrological analysis using existing studies or approved methods.</li> </ul>		X	
<ul style="list-style-type: none"> <li>v Perform a risk analysis.</li> </ul>		X	
<ul style="list-style-type: none"> <li>c Hydrology and Hydraulics Conceptual Design <ul style="list-style-type: none"> <li>i Major structures: <ul style="list-style-type: none"> <li>A Complete conceptual scour and hydraulic analysis.</li> <li>B Determine required hydraulic size and skew of major structures/Channels</li> <li>C Determine low chord elevation per CDOT criteria</li> </ul> </li> <li>ii Complete preliminary design for PWQ CMs and outlet structures.</li> <li>iii If required, identify and assist CDOT in coordinating any PWQ design requirements or potential funding participation of local municipalities or agencies.</li> <li>iv Recommend culvert pipe sizes, type, shape and material for proposed detours.</li> </ul> </li> </ul>		X	
<ul style="list-style-type: none"> <li>c Prepare preliminary construction plans that include: <ul style="list-style-type: none"> <li>i Drainage Plan Sheets</li> </ul> </li> </ul>		X	
<ul style="list-style-type: none"> <li>d Prepare preliminary Hydraulic Design Report or Final Drainage Report in accordance with the CDOT Drainage Design Manual <ul style="list-style-type: none"> <li>i Introduction, Hydrology, Existing Structures and Design Discussion sections should be close to final at this level. Design Discussion should include CDOT and local criteria the project intends to meet.</li> <li>ii Recommended design should be preliminary at this level and progress through final design.</li> <li>iii All design assumptions and related design decisions shall be documented.</li> </ul> </li> </ul>			N/A

	CDOT (C)/ Other*	Consultant	Not Applicable
e Perform internal QA/QC prior to submittal to CDOT.		X	
<b>E. Environmental-Water Quality</b>			
a Storm Water Management Plan Initiate a Storm Water Management Plan in accordance with: i <i>Municipal Separate Storm Sewer Systems (MS4)</i> ii <i>CDOT's Erosion Control and Storm Water Quality Guide</i> iii <i>CDOT's Standard Specifications</i> iv <i>CDOT Standard Plans</i> v <i>Other appropriate documents</i> vi <i>CDPHE's Construction Discharge Permit System requirements</i> vii <i>Local agency SWMP/GESC/EC requirements</i>			N/A
b Prepare preliminary Permanent Water Quality (PWQ) plans in conjunction with Section 7.C.5.b.iii of this document. i Determine PWQ requirements (local agency MS4 requirements, CDOT requirements, etc.) ii Develop PWQ alternatives that will meet CDOT and local agency MS4 requirements iii Identify right-of-way requirements and utility impacts for alternatives iv Identify all entities and v Other appropriate documents		X	
c Prepare preliminary water quality report as an appendix to the Hydraulic Design Report to include PWQ Evaluation and Tracking Forms, cost estimate for PWQ CMs, etc.			N/A
d Conduct a PWQ meeting to discuss alternatives with CDOT PWQ Specialist/Water Pollution Control Manager, Hydraulics Engineer, and Project Manager.		X	
e Perform internal QA/QC prior to submittal to CDOT.		X	
<b>F. Utility Coordination</b>			
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		
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		
c Incorporate utility locations in plans from utility survey	C		
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.			N/A
e Ditch Company Coordination		X	

	CDOT (C)/ Other*	Consultant	Not Applicable
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. Including the development of Irrigation Agreement.			
<b>G. Roadway Design and Roadside Development</b> CDOT roadway design staff will produce the conceptual roadway design alternatives with the support of the consultant, unless the consultant is directed to complete or finish portions of the design to accelerate the schedule or for other reasons as determined by CDOT. Coordinate all design activities with required CDOT specialty units and other outside entities.	C	X	
a Roadway Design	C	X	
i Input, check, and plot survey data	C	X	
v 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	
vi 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	
vii Provide alignments, toes of slope and pertinent design features, including permanent and temporary impacts, to the ROW, Utility and Environmental Managers.	C	X	
viii Plot/develop all required information on the plans in accordance with all applicable CDOT policies and procedures.	C	X	
ix Using current approved CDOT software, generate a 3 dimensional design model and produce preliminary quantities	C	X	
<b>H. Right-of-Way</b> Preliminary Ownership Map	C		
<b>I. Major Structural Design</b> 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 an 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			
i Obtain the structure site data. The following data, as applicable, shall be collected: (Typical roadway section, roadway plan and profile sheets 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.			X

		CDOT (C)/ Other*	Consultant	Not Applicable
x	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.		X	
b	<b>Structures Report</b>			
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.		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.		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.		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.		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.		X	
vi	Compute conceptual quantities and conceptual cost estimates as necessary to evaluate and compare the structure layout, type, and rehabilitation alternatives.		X	
vii	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.		X	
viii	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 treatment. Perform an independent design and detail check of the general layout.		X	
J.	<b>Construction Phasing Plan</b> 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.		X	

**SECTION 8  
CONTRACT CONCLUSION (CHECKLIST)**

**1. SUPPLEMENTAL WORK**

It is anticipated that this contract may be supplemented for other related I-270 pre-construction task orders including but not limited to:

- A. NEPA actions for I-270 Express Lane Direct Connect ramps to I-70
- B. Preliminary or Final Design at Interchanges
- C. Final Design for portions or all of the corridor
- D. ROW acquisition plans
- E. Preparation of Design-Build procurement documentation (if D-B is selected for I-270)
- F. Value Engineering (VE) Study as required by FHWA
- G. Pavement Lifecycle Cost Analysis & Materials Report

**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. Completion of review of contract submittals
- D. Design Plans, and Engineer's Estimate
- E. Hydrological & Hydraulic Report (signed and sealed)
- F. Structural Reports (signed and sealed)
- G. Geotechnical Report (signed and sealed)
- H. Environmental Technical Resource Reports
- I. Environmental NEPA Documents

## **APPENDIX A REFERENCES**

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.

- 1 **AMERICAN ASSOCIATION 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) Bridge Design Specifications
  
- 2 **COLORADO DEPARTMENT OF TRANSPORTATION PUBLICATIONS** (using latest approved versions):
  - A. Design Guide (all volumes)
  - B. Bridge Design Manual
  - 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. Executive Order 11988 & 13690 FHWA Federal-Aid Policy Guide
  
  - G. Technical Advisory T6640.8A
  
  - H. U.S. Department of Transportation Order 5610.1E
  
  - I. Geometric Geodetic Accuracy Standards and Specifications for Using GPS Relative Positioning Techniques
  
  - J. ADAAG Americans With Disabilities Act Accessibility Guidelines
  
  - K. 23 CFR 771, the FHWA Technical Advisory T6640.8A
  
  - L. FHWA NHI Hydraulic Circular(HEC) and Hydraulic Design Series(HDS) Reports
  
  - M. 44 CFR 59-72, standards of the National Flood Insurance Program(NFIP)
- 5 **AREMA:**
- A. Manual for Railway Engineering
- 6 **OTHER:**
- A. Urban Storm Drainage Criteria Manual (UDFCD)
  
  - 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 Flood Zone –
- 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	AREMA-	American Railway Engineering and Maintenance-of-way 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	BFE	Base Flood Elevation
9	BLM-	Bureau of Land Management
10	BNSF-	Burlington Northern Santa Fe Railroad
11	CA-	Contract Administrator. The CDOT Manager responsible for the satisfactory completion of the contract by the consultant.
12	CAP-	CDOT's Action Plan
13	CBC-	Concrete Box Culvert
14	CDOT-	Colorado Department of Transportation
15	CDOT/PM-	Colorado Department of Transportation Project Manager – The CDOT Engineer responsible for the day to day direction and CDOT Consultant coordination of the design effort (as defined in Section 2 of this document)
16	CDOT/STR-	Colorado Department of Transportation Structure Reviewer – The CDOT Engineer responsible for reviewing and coordinating major structural design
17	CDPHE-	Colorado Department of Public Health and Environment
18	CEQ-	Council on Environmental Quality
19	COG-	Council of Governments
20	COGO-	Coordinate Geometry Output
21	CONSULTANT-	Consultant for this project
22	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).
23 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.
24 CWCB	Colorado Water Conservation Board
25 DEIS-	Draft Environmental Impact Statement
26 DHV-	Future Design Hourly Volume (two-way unless specified otherwise)
27 DRCOG-	Denver Regional Council of Governments
28 D&RGW-	Denver & Rio Grande Western Railroad
29 EA-	Environmental Assessment
30 EIS-	Environmental Impact Statement
31 ESAL-	Equivalent Single Axle Load
32 ESE-	Economic, Social and Environmental
33 FEIS-	Final Environmental Impact Statement
34 FEMA-	Federal Emergency Management Agency
35 FHPG-	Federal Aid Highway Policy Guide
36 FHWA-	Federal Highway Administration
37 FIPI-	Finding In Public Interest
38 FIR-	Field Inspection Review
39 FONSI-	Finding of No Significant Impact
40 FOR-	Final Office Review
41 GPS-	Global Positioning System
42 MAJOR STRUCTURES-	Bridges and culverts with a total clear span length greater than twenty feet. This length is measured along the centerline of roadway for bridges and culverts, from abutment face to abutment face, Retaining structures are measured along the horizontal distance along the top of the wall. Structures with exposed heights at any section over five feet and total lengths greater than a hundred feet as well as overhead structures including (bridge signs, cantilevers and butterflies extending over traffic) are also considered major structures.

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