

**PART I
SCOPE OF WORK
PROJECT SPECIFIC**

CONTRACT TYPE: Cost plus Fixed Fee

PROJECT: CADD Engineering Systems Management (CESM)

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

PART 2
ATTACHMENTS

NOTE: PART 2, AND ATTACHMENTS 1, AND B ARE INCLUDED AS PART OF THIS DOCUMENT.

**PROJECT SPECIFIC
PART I
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SECTION 1 PROJECT SPECIFIC INFORMATION

1.01 Planned Improvements.

The project will build on the Colorado Department of Transportation's current software, configuration, workflows and training programs to create a complete electronic project delivery system from planning through construction.

1.02 Project Goals.

The proposed goals are to:

- Continue to build on CDOT's current software, configuration, workflows and training programs to create a complete electronic project delivery system from planning through construction. Implementation of the program will provide a complete electronic project delivery system where all CDOT's selected software packages, utilized workflows, configuration, and training work seamlessly together.
- Expanding and increasing the utilization of ProjectWise. Over the past three years CDOT has made a significant investment in its ProjectWise environment. CDOT plans to expand the use of ProjectWise across all disciplines and project phases from planning through project completion and archival.
- Expanding the geospatial capabilities of ProjectWise and the integration of ProjectWise and the CDOT ESRI GIS system. The goal of the effort is to develop the processes and tool to allow CDOT's CADD / ProjectWise and GIS systems to seamlessly share and exchange information across environments.

Additional goals and objectives of the project shall be further defined by CDOT upon initiation of the contract. Writing individual task orders on an as needed basis will identify all work.

1.03 Project Background.

CDOT's design and construction staff utilize roadway and computer aided design & drafting (CADD) software as a critical part of the production of roadway and other designs. CDOT is currently using Bentley's InRoads Survey, MicroStation, InRoads and ProjectWise products.

The CDOT CADD configuration is mature and based on CDOT standards and processes. This includes a majority of CDOT's symbology, line styles and design standards used in design process and the creation of plan set is essential complete and stable. New symbology and standards are added the CDOT configuration as they are identified and requested.

The following is a list of software products that CDOT is using or interested in heading towards implementing. More may be added to this list depending on recommendations by CDOT or the Consultant.

- Bentley InRoads Survey
- Bentley MicroStation
- Bentley InRoads
- Bentley ProjectWise
- Bentley iPlot
- Bentley Navigator
- Bentley Descartes
- Bentley Bridge (or similar package)

- Bentley Storm and Sanitary (or similar package)
- Bentley Quantity Manager
- Bentley Standards Checker
- SignCAD
- AutoTurn
- LEAP RC-PIER
- LEAP CONSPLICE
- LEAP CONSPAN
- CulvertMaster
- StormCAD
- HEC-Pack
- PondPack 1 Pond
- FlowMaster
- AASHTO Transport
- AASHTO SiteManager
- AASHTO Pontis, Opis, Virtis
- ESRI ArcGIS products
- SAP Enterprise Resource Planning (ERP)

CDOT has many specialties that are to be included as part of the complete electronic project delivery system. The specialty groups are as follows:

- Planning, survey/ROW, roadway design, hydraulics, traffic/ITS, structures, environmental, utilities, GIS, materials/geotechnical, construction, M&S Standards and other various CDOT standards

In addition, CDOT has established the following committees:

- Standards and Configuration, Bridge User Group, Steering, and ProjectWise Task Force

Along with the configuration of the Bentley software CDOT has developed custom training programs. These programs include instructor led training and or Online training. The following is a list of training classes that have been developed:

- Advanced Roadway Modeling Using InRoads
- Bridge Essentials Using InRoads V8i
- CDOT MicroStation Essentials
- CDOT ProjectWise for Data Administrators
- CDOT ProjectWise for End Users
- InRoads Geometry Fundamentals
- InRoads Geometry/ROW Plan Development
- InRoads Storm and Sanitary
- Roadway Design Using InRoads V8i
- Using InRoads Survey for Data Reduction
- Hydraulic Drafting for Storm Drain Design Using InRoads
- ProjectWise End User Training
- ProjectWise Online Training

1.04 Project Costs. The cost of this project is estimated to be \$5,000,000 for 5 years.

1.05 Work Duration. The time period for the project is estimated to be 5 years.

1.06 Consultant Responsibility.

The Consultant responsibility for the contract shall consist of building on CDOT's current software, configuration, workflows and training programs to create a complete project delivery system from planning through construction as outlined in Section 7 including, but not limited to, any portion of the following phase work:

Project Initiation and Continuing Requirements

- Initial Project Meeting
- Project Schedule
- Project Management
- Evaluation of Software and Hardware

Project Development

- Communication
- Project Review Team
- CAD and ProjectWise Planning
- CAD and ProjectWise Configuration
- CAD and ProjectWise Workflows
- Custom Extensions
- MicroStation/InRoads/ProjectWise Transportation Subject Matter Expert(s):
 - MicroStation/InRoads
 - Support
 - Develop Customized Training
 - Provide Customized Training
 - Designing and Developing self-paced online training
 - Developing CAD Manuals
 - CAD Drafting
- ProjectWise Subject Matter Expert:
 - Provide on-site ProjectWise Administration
 - Provide on-site and telephone user support
 - Provide on-site system maintenance, system upgrades, and troubleshooting services.
 - Document CDOT ProjectWise CDOT Business Processes.
 - Develop ProjectWise workflows to improve CDOT processes.
 - Develop training resources.

1.07 Work Product.

The Consultant work products are:

- Reports
- Schedules
- Meeting Minutes
- Configuration Releases
- CAD and ProjectWise Workflow Reports and Diagrams
- Specialty Group Manuals (Drafting, Hydraulics, ROW, Bridge, etc)
- CAD Training Manuals
- CAD Training Courses
- ProjectWise Training Manuals
- ProjectWise Training Courses
- CAD drawings
- Custom Extensions
- Online Training
- Prepare and Conduct Demonstrations
- Develop and Update Training Materials
- Prepare and Conduct Training
- ProjectWise System Administration

Detailed work product requirements are described in the following sections and in Part 2.

1.08 Work Product Completion. All submittals must be accepted by the CDOT Contract Administrator or his/her designee.

Additional Project Information. Additional information may be found in the Colorado Department of Transportation CADD website through the following link:

<http://www.coloradodot.info/business/designsupport/cadd>

This link includes information on the following:

- Training manuals, guides, and class data
- Training videos
- Workflows
- CADD Manuals
- Current CADD configuration
- ProjectWise training material

Other CDOT materials found on the Websites:

<http://www.coloradodot.info/business/designsupport>

<http://www.coloradodot.info/business/manuals/right-of-way>

<http://www.coloradodot.info/business/manuals/survey>

<http://www.coloradodot.info/library/bridge/bridge-manuals>

1.09 Scope of Work Organization

This draft scope of work has been carefully reviewed by the Department and reflects a plan of approach based on the known goals. One factor determining the selection of a Consultant is the ability of that Consultant to

analyze the project goals, evaluate the work elements, and formulate a work plan. This process may produce new approaches or modification to the project work elements. Because of that, all Consultants should be aware that the Final Scope of Work for a project will be produced with input from the selected Consultant.

SECTION 2
PROJECT MANAGEMENT AND COORDINATION

2.01 CDOT Contacts. The Contract Administrator for this project is:
Richard Zamora, Project Development Manager.

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

Name: Sahar Alola
Title: CAD Manager
Address: 4201 East Arkansas, Room 124
Denver, CO 80222
Telephone: 303-757-9858

2.02 Project Coordination. Coordination will be required with the following:

- CDOT Personnel
- CDOT Consultants
- Bentley Systems Inc.
- Other Agencies as identified in the Scoping Process

SECTION 3 PROJECT DESCRIPTION

3.01 Background. This project is a statewide effort and will be managed out of CDOT's headquarters office located at 4201 East Arkansas Ave., Room 124, Denver, CO 80222.

3.02 Project Limits. The limits of this project shall be throughout the state of Colorado.

3.03 Work Elements. The scope of work will provide for CADD and ProjectWise:

Project Initiation and Continuing Requirements

- Initial Project Meeting
- Project Schedule
- Project Management
- Evaluation of Software and Hardware

Project Development

- Communication
- Project Review Team
- Planning
- Configuration
- System upgrades for CADD and ProjectWise
- Workflows
- Custom Extensions
- MicroStation/InRoads and ProjectWise Subject Matter Expert
- Transportation Subject Matter Expert(s)
- Support
- Develop Customized Training
- Deliver Customized Training
- Designing and Developing Self-Paced Online Training
- CAD Manual
- ProjectWise Users Guide Manual

SECTION 4
KNOWN EXISTING CONFIGURATION, WORKFLOWS, MANUALS, TRAINING VIDEOS and
PROJECTWISE ONLINE TRAINING

- 4.01 Configuration.** Version 5.05 or latest version is available on CDOT web site:
<http://coloradodot.info/business/designsupport/cadd>
- 4.02 Workflows.** Available from the CDOT CAD web site:
<http://coloradodot.info/business/designsupport/cadd>
- 4.03 Manuals.** All CADD manuals are available from the following link:
<http://coloradodot.info/business/designsupport/cadd>
Other CDOT materials found on the websites:
<http://www.coloradodot.info/business/designsupport>
<http://www.coloradodot.info/business/manuals/right-of-way>
<http://www.coloradodot.info/business/manuals/survey>
<http://www.coloradodot.info/library/bridge/bridge-manuals>
- 4.04 Training Videos.** All CADD and ProjectWise training videos are available from the following link:
<http://coloradodot.info/business/designsupport/cadd>
- 4.05 ProjectWise Online Training.** Available from the CDOT CAD web site:
<http://coloradodot.info/business/designsupport/cadd>

SECTION 5
ITEMS TO BE FURNISHED BY CDOT

5.01 CDOT Manuals, Specifications, Standards, etc. Electronic files of applicable standards and all CDOT forms specified in this document.

5.02 Project Specific Items:

- Configuration
- Workflows
- Manuals
 - Drafting Manual (will be available upon completion; draft copies may be available upon request)
CADD and ProjectWise training manuals, videos and workflows can be found at this link:
<http://coloradodot.info/business/designsupport/cadd>
 - Other CDOT materials found on the websites:
<http://www.coloradodot.info/DesignSupport/>
http://www.coloradodot.info/ROW_Manual/
http://www.coloradodot.info/Survey_Manual/

**SECTION 6
GENERAL INFORMATION**

- 6.01 Authorization to Proceed.** Work shall not commence until the written Notice-to-Proceed is issued by the State and received by the Consultant. In addition, prior to work commencing, the Consultant must certify in writing that the work will be completed by the time specified in the task order(s) issued. Payment to the Consultant may be withheld if work is not completed within the allotted time.

Where work performed is unsatisfactory, CDOT shall notify the Consultant in writing that work shall cease and all subsequent payments withheld until the problem(s) is resolved to the satisfaction of CDOT. Once satisfied and resolved a written authorization to continue with the work effort shall be provided to the Consultant by CDOT.

- 6.02 Project Coordination.** The routine working contact will be between the CDOT Project Manager (CDOT/PM) and the Consultant Project Manager (C/PM) as defined in Attachment B. Each Project Manager will provide the other with:

- a. Written synopses or copy of their respective contacts (both by telephone and in person) with others.
- b. Copies of pertinent written communications.

- 6.03 Routine Reporting and Billing.** The Consultant will provide the following on a routine basis:

- a. Coordination of all contract activities by the C/PM.
- b. The periodic reports, schedules and billings required by CDOT Procedural Directive 400.2 (Monitoring Consultant Contracts) and identified in this document.
- c. Minutes of Meetings: The minutes will be completed and will be provided to the CDOT/PM within five (5) working days after the meeting. When a definable task is discussed during a meeting, the minutes will identify the "Action Item", the agency responsible for accomplishing it, and the proposed completion date.
- d. Agendas of Meetings: The agendas for meetings will be completed and will be provided to the CDOT/PM five (5) working days prior to the meeting.
- e. In general, all reports and submittals must be accepted by CDOT prior to their content being utilized in follow-up work effort.

6.04 Personnel Qualifications. The Consultant shall have strong experience in transportation engineering software support, training, configuration, customization and administration and will be expected to be thoroughly familiar with CDOT process and procedures. Personnel qualifications and staffing levels for the project shall be subject to the approval of the CDOT Project Manager. CDOT will reserve the right to review the resume and interview any new proposed staff to the project. The Consultant shall be certified as defined by the requirements set. MicroStation, InRoads, ProjectWise and others software packages as may be identified in the scope of work in this contract are the tools selected by CDOT to develop legal contract documents signed and sealed by Professional Engineers and Land Surveyors. Certain tasks will require Licensed Professional Engineers (PE) or Professional Land Surveyors (PLS) who are licensed with the Colorado State Board of Registration for Professional Engineers and Land Surveyors.

The Consultant will provide staff with following credentials and skills:

- Engineering professionals will be needed for the following specialty areas: Roadway Design, Traffic/ITS, Hydraulics, Survey, Right-of-Way, Utilities, Construction, Structures, and Materials/Geotechnical.
- Professional Engineers and Land Surveyors available to assist with configuring the software, developing workflows, training materials, provide training and support, evaluating software packages (structural, hydraulic, etc.). Evaluating interoperability between software products, configuration and workflows developed. Test CDOT specific design decisions (for example: super elevation, sight distance), interpret and incorporate CDOT manuals and standards (for example: design, materials, hydraulic, M&S, survey, right-of-way, structural and others identified in this document) and other tasks as identified.
- Information Technology Professionals to develop and support MicroStation Development Language (MDL), Visual Basic for Applications (VBA), Visual C++, .NET, Microsoft Access, Excel and SQL Server application, and ProjectWise web and SharePoint application integration in the CDOT environment
- On-site ProjectWise Administration and Support services for the CDOT ProjectWise and Windows Server environment. Responsible for assisting in the day-to-day management, user support, trouble shooting, problem resolution and system upgrades.

Personnel provided by the consultant who do not meet all of the specified requirements, or who fail to perform their work in an acceptable manner, shall be removed from the project when determined and directed by CDOT Project Manager.

6.05 CDOT Computer/Software Information. The primary hardware used by CDOT is Intel Pentium or equivalent workstations. The operating systems are Windows 7 and Windows Server 2003, 2008 or current CDOT environment. Most workstations are connected to the CDOT wide area network. The primary types of software are:

Earthwork:	Bentley InRoads V8i
Drafting-Auto:	MicroStation V8i
Survey:	TMOSS (A CDOT developed numeric coding system for the automation and standardization of survey and aerial data)
Geometry:	Bentley InRoads V8i
Bridge:	AASHTO Pontis, Opis and Virtis, CDOT Bridge Geometry, MathCAD and numerous other design or design check applications

Estimating:	Trns*port (Bid Analysis and Management Systems), an AASHTO-sponsored software
Specifications:	Microsoft Word
Traffic:	Highway capacity software (HCS) Passer 11-90 Quick Response system (QRS) II SignCAD AutoTurn
Hydraulics:	Hydrologic Engineering Center's River Analysis System (HEC-RAS) and Bentley's StormCAD, FlowMaster and Culvert Master
Pavement Design:	DARWin (AASHTO)
Project Management:	Microsoft Project
Project Document Management:	Bentley ProjectWise
Construction:	Site Manager, an AASHTO sponsored software
Enterprise Resource Planning (ERP):	SAP
Collaboration Tool:	Microsoft SharePoint

A comprehensive list of Project Development software used by CDOT s included in Attachment C.

Following is a list of software products that CDOT is interested in heading towards implementing. More may be added to this list depending on recommendations by CDOT or the Consultant.

- Bentley Navigator
- Bentley Quantity Manager
- Bentley Standards Checker
- Bentley iPlot
- Bentley iModel Composition Server for PDF
- Bentley Dynamic Rights Management Service
- Mobile Computing Devices including iPad and or Tablet Devices
- Bentley ProjectWise Connector V8i for ArcGIS
- Bentley ProjectWise and SharePoint

- 6.06 Computer Software Compatibility.** The Consultant is responsible for insuring that any proposed solutions are compatible with existing Project Development Systems software.
- 6.07 Project Design Data and Standards.** Attachment A is a list of technical references applicable to CDOT work. The Consultant is responsible for ensuring compliance with the listed references. Conflicts in criteria shall be resolved by the CDOT/PM.

**SECTION 7
WORK ACTIVITY ASSIGNMENTS**

7.01 Consultant Responsibilities: This list establishes the Consultant’s individual task responsibility. The Consultant shall maintain the ability to perform all work tasks which are indicated below by an ‘X’ mark in the Consultant column, in accordance with the forms and conditions of Part 2, and the applicable CDOT standards. Selected work tasks shall be assigned only after coordination and consultation with CDOT. The Consultant is also responsible for coordinating the required work schedule for those tasks accomplished by CDOT and other agencies.

ACTIVITIES

(See Part 2 for Task Descriptions)

	<u>CDOT/OTHER</u>	<u>CONSULTANT</u>
A. Project Initiation and Continuing Requirements:		
1. Initial Project Meeting	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
2. Project Schedule		
a. Update Implementation Plan.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
b. Update 10-year Long Range Plan	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
3. Project Management		
a. Oversee Implementation of the CESM Program	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
b. Workflow and Configuration Consistency	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c. Workflow and Configuration Implementation	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
d. Organize and Sequence Implementation	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e. Organize and maintain communications	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
f. Schedule and Coordinate Training Courses	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
g. Schedule and Coordinate Online training resources	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
h. Schedule and Coordinate Support	<input type="checkbox"/>	<input checked="" type="checkbox"/>
i. Schedule and Coordinate Meetings.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
j. Coordinate with Specialty Teams	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
k. Manage Consultant Team	<input type="checkbox"/>	<input checked="" type="checkbox"/>
l. Coordinate Reports, Workflows, and Configuration	<input type="checkbox"/>	<input checked="" type="checkbox"/>
m. Manage Quality Control	<input type="checkbox"/>	<input checked="" type="checkbox"/>
n. Attend Meetings	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
o. Coordinate On-site Support Visits	<input type="checkbox"/>	<input checked="" type="checkbox"/>
4. Evaluation of Software and Hardware	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
B. Project Development:		
1. Communication		
a. Contact List	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b. General Meetings	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
(1) Weekly Group Meetings	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
(2) Monthly Meetings	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
(3) Specialty Group Meetings	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
c. Communication Aids	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
(1) Graphics Support	<input type="checkbox"/>	<input checked="" type="checkbox"/>
(2) Web-site	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

- | | | | |
|----|---|-------------------------------------|-------------------------------------|
| d. | Training & Support | | |
| | (1) Local Office | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| | (2) Local Training Facility | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| | (3) Provide on-site CADD Training & Support on
CDOT Premises | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| | (4) Provide on-site ProjectWise Training &Support on
CDOT Premises | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 2. | Planning | | |
| | a. Develop Implementation Plan | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| | b. Develop 10-year Long Range Plan | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| 3. | Configuration | | |
| | a. Develop CDOT's configuration | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| | b. Integrate Specialty Groups Needs and Configuration | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| | c. Integrate Software Programs | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| | d. Document all Configuration Decisions | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| | e. Code and Quality Control check Configuration | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| | f. Support Configuration and make fixes | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| | g. Update Configuration | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| | h. Coordinate and Work with OIT department | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| 4. | Workflows | | |
| | a. Provide Alternatives, Options and Workflows | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| | b. Provide Subject Matter Expert | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| | c. Integrate Specialty Groups Needs and Workflows | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| | d. Document Workflows | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| | e. Update Workflows | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| | f. Integrate Software Programs | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 5. | Custom Extensions | | |
| | a. Design and Develop Custom Extensions | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| | b. Implementation of Custom Extensions | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| | c. Develop Functional Specification | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| | d. Prepare Technical Design Specification | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| | e. Review Technical Design Specification | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| | f. Code and Quality Control Check Custom Extension | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| | g. Support Implementation of Custom Extension | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| 6. | MicroStation/InRoads Subject Matter Expert | | |
| | a. Quality Assurance and Testing | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| | b. Test Configuration | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| | c. Support Configuration | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| | d. Identify Problems | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| | e. Assist with Specialized Software Requirements | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| | f. Assist with Product Selection | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| | g. Provide Training Recommendations | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| | h. Assist with Setting Preferences and Standards | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| | i. Provide Support | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| | j. Prepare Plan Sheets | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| | k. Prepare and Conduct Demonstrations | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| | l. Identify Enhancements | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| | m. Prepare Web Content | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| | n. Documentation of Meetings and Problem Issues | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |

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|----|--|-------------------------------------|-------------------------------------|
| o. | Coordinate and Work with OIT | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| p. | Update and Assist with CAD Website | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| 7. | ProjectWise Subject Matter Expert | | |
| a. | Provide on-site ProjectWise Administration | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| b. | Provide ProjectWise system documentation | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| c. | Provide on-site ProjectWise user support | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| d. | Provide on-site System Maintenance, Upgrade,
and Troubleshooting services. | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| e. | Document CDOT ProjectWise CDOT Business
Processes. | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| f. | Develop ProjectWise workflows to improve
CDOT processes.
Develop ProjectWise training resources. | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| g. | Quality Assurance and Testing | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| h. | Test Configuration | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| i. | Support Configuration | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| j. | Identify Problems | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| k. | Assist with Specialized Software Requirements | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| l. | Assist with Product Selection | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| m. | Provide Training Recommendations | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| n. | Assist with Setting Preferences and Standards | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| o. | Provide Support | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| p. | Prepare and Conduct Demonstrations | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| q. | Identify Enhancements | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| r. | Prepare Web Content | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| s. | Documentation of Meetings and Problem Issues | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| t. | Coordinate and Work with OIT | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| u. | Update and Assist with CAD Website | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| v. | Assist with the Integration of the Current CDOT CAD
Software and ProjectWise | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| w. | Develop, Update & Provide Custom Training | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| x. | Develop & Update On-Line Training Resources | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| 8. | Transportation Subject Matter Expert(s): | | |
| a. | Provide CDOT with Specialty Expertise | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| b. | Identify Enhancements | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| c. | Assist with Developing and Setting Standards | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| d. | Provided Coordination Between Specialty Groups | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| e. | Coordination with Team Members | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| f. | Provide Training Recommendations | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| g. | Provide Support to CDOT employees | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| h. | Prepare and Conduct Demonstrations | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| i. | Develop & Update Training Materials | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| j. | Assist CDOT with Training | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| k. | Assist CDOT Personnel in Specialty Areas | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| 9. | Support | | |
| a. | Provide Statewide On-Site Support | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| b. | Provide Telephone Support to CDOT personnel | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| c. | Evaluate Users Problems and Make Recommendation | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| d. | Provide Telephone Support to Consultants | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

- | | | | |
|-----|--|-------------------------------------|-------------------------------------|
| e. | Develop Plan for Frequently Asked Questions | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| f. | Provide Software Support | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| g. | Support CDOT Staff | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| h. | Keep and maintain activity diaries | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| 10. | Develop Customized Training | | |
| a. | Prepare Training Plan | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| b. | Prepare Customized Course Outlines | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| c. | Develop Custom Course Materials | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| 11. | Provide Customized Training | | |
| a. | Develop Customized Training Manuals | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| b. | Provide Statewide Training | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| c. | Provide Classroom(s) | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| d. | Update and Maintain Registration System | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| e. | Provide Course Evaluation Survey | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| f. | Provide Instructor | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 12. | Designing and Developing Self-Paced Tutorials: | | |
| a. | Develop, Test and Implement Self-Paced Web Tutorials | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| b. | Work with CDOT's OIT Department | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| c. | Provide Course Evaluation Survey | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| d. | Update Tutorials | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| 13. | CAD Drafting | | |
| a. | Drafting | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| b. | Update Drawings | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

**SECTION 8
CONTRACT CONCLUSION**

8.01 Supplemental Work. It is anticipated that this contract will be supplemented for:

- Fiscal Year Money Allocations
- As Funds Become Available

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

- Project Schedule
- Meeting Agendas
- Meeting Minutes
- Final Implementation Plan
- Final Long Range Plan
- Final Configuration
- Final Workflows
- Final Custom Extensions
- Customized Training Plans
- All Customized Training Delivered
- All Self-Paced Web Tutorials Delivered
- Evaluation Surveys
- CAD Drawings

and the completion of review of contract submittals.

**PROJECT SCOPE OF WORK
ATTACHMENTS**

- A. References
- B. Definitions
- C: Project Development Systems Inventory

ATTACHMENT A
References

REFERENCES

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

1. A Policy on Design Standards – Interstate System
2. A Policy on Geometric Design of Highways and Streets
3. Guide for Design of Pavement Structures
4. Standard Specifications for Highway Bridges
5. Guide for the Design of High Occupancy Vehicle and Public Transfer Facilities
6. Guide for Development on New Bicycle Facilities
7. Standard Specifications for Transportation Materials and Methods of Sampling and Testing – Part I, Specifications and Part II, Tests
8. Highway Design and Operational Practices Related to Highway Safety
9. Roadside Design Guide

B. COLORADO DIVISION OF HIGHWAYS PUBLICATIONS (using latest approved versions):

1. Action Plan
2. CDOT Design Guide (all volumes)
3. CDOT Bridge Design Guide
4. CDOT Bridge Detailing Manual
5. Bridge Rating Manual
6. Project Development Manual
7. Wetlands and Water Quality
8. Field Log of Structures
9. Cost Data Book
10. Drainage Design Manual
11. CDOT Quality Manual (when updated)
12. Survey Manual
13. Field Materials Manual
14. CDOT Design Guide, Computer Aided Drafting (CAD)
15. Erosion Control and Stormwater Quality Guide
16. Standard Plans, M & S Standards (also available on the internet)
17. Standard Specifications for Road and Bridge Construction and CDOT Supplemental Specifications
18. Item Description and Abbreviations (with code numbers) compiled by Construction Cost Estimates & Market Analysis Unit, CDOT (also available on the internet)
19. Right-of-Way Manual, Chapter 2, Plans and Descriptions, Procedures, and General Information
20. The State Highway Access Code
21. Utility Manual
22. TMOSS Generic Format
23. Field TMOSS Topography Coding
24. Topography Modeling Survey System User Manual
25. Interactive Graphics System Symbol Table

C. CDOT PROCEDURAL DIRECTIVES (using latest approved versions):

<u>Number</u>	<u>Title</u>
400.2	Monitoring Consultant Contracts
501.2	Cooperative Storm Drainage System
514.1	Field Inspection Review (FIR)
516.1	Final Office Review (FOR)
1304.1	Right-of-Way Plan Revisions
1601.0	Interchange Approval Process
1700.3	Plans, Specifications and Estimates (PS & E) and Authorization to Advertise for Bids under Certification Acceptance (CA)
1700.7	Plans and Specifications for Structure Plans under CA
1700.8	Plans and Specifications for Traffic Engineering Plans under Certifications Acceptance
1905.1	Preparation of Plans and Specifications for Structures prepared by Staff Bridge Branch

D. FEDERAL PUBLICATIONS (using latest approved versions):

1. Manual on Uniform Traffic Control Devices
2. Highway Capacity Manual
3. Urban Transportation Operations Training – Design of Urban Streets, Student Workbook
4. Reference Guide Outline – Specifications for Aerial Surveys and Mapping by Photogrammetric Methods for Highways
5. FHWA Federal-Aid Policy Guide
6. Technical Advisory T6640.8A
7. U.S. Department of Transportation Order 5610.1E
8. Geometric Geodetic Accuracy Standards and Specifications for Using GPS Relative Positioning Techniques

E. AREA:

1. Manual for Railway Engineering

ATTACHMENT B
Definitions

DEFINITIONS

AASHTO	American Association of State Highway & Transportation Officials
ADT	Average two-way 24-hour Traffic in Number of Vehicles
AREA	American Railway Engineering Association
ATSSA	American Traffic Safety Services Association
AT & SF	Atchison, Topeka & Santa Fe Railway Company
BLM	Bureau of Land Management
BNRR	Burlington Northern Railroad
CA	Contract Administrator – the CDOT Manager responsible for the satisfactory completion of the contract by the Consultant.
CAP	CDOT's Action Plan
CBC	Concrete Box Culvert
CDOT	Colorado Department of Transportation
CDOT/PM	Colorado Department of Transportation Project Manager – the CDOT Engineer responsible for the day to day direction and coordination of the CDOT/Consultant design effort.
CDOT/STR	Colorado Department of Transportation Structure Reviewer – the CDOT Engineer responsible for reviewing and coordinating major structural design.
CEA	Council on Environmental Quality
CESM	Computer Engineering Software Transition
COG	Council of Governments
COGO	Coordinate Geometry Output
CONSULTANT	Consultant for this project
CONTRACT ADMINISTRATOR	Typically a Region Engineer or Branch Head. The CDOT employee directly responsible for the satisfactory completion of the contract by the Consultant. The contract administration is usually delegated to a CDOT Project Manager.
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's design effort.
DEIS	Draft Environmental Impact Statement
DHV	Future Design Hourly Volume (two way unless specified otherwise)
DOR	Region Office Review
DRCOG	Denver Regional Council of Governments
D&RGW	Denver & Rio Grande Western Railroad
EA	Environmental Assessment
EIS	Environmental Impact Statement
ESAL	Equivalent Single Axle Load
ESE	Economic, Social and Environmental
FEIS	Final Environmental Impact Statement
FEMA	Federal Emergency Management Agency
FHPM	Federal-Aid Highway Policy Guide
FHWA	Federal Highway Administration
FIR	Field Inspection Review
FONSI	Finding of No Significant Impact
FOR	Final Office Review
GPS	Global Positioning System
MAJOR STRUCTURES	Bridges and culverts with a total length greater than hundred feet and maximum exposed height at any section of over five feet. This length is measured along the centerline of roadway for bridges and culverts, and is the horizontal distance along

	the top of wall for retaining walls. Overhead structures (sign bridges, cantilevers and butterflies extending over traffic) are also major structures.
MOSS	‘Modeling of Surfaces and Strings’ computer program
MPO	Metropolitan Planning Organization, Denver Regional Council of Governments, Piles Peak Area Council of Governments, Grand Junction MPO, Pueblo MPO, North Front Range Council of Governments.
NEPA	National Environment Policy Act
NGS	National Geodetic Survey
NICET	National Institute for Certification in Technology
NOAA	National Oceanic and Atmospheric Administration
PAPER-SIZES	See CDOT Computer-Aided Drafting Manual – Tables 6-13 and 8-1
PE	Professional Engineer licensed in Colorado
PM	Program Manager
PLS	Professional Land Surveyor licensed in Colorado
PRT	Project Review Team
PS & E	Plans, Specifications and Estimate
PROJECT	The work defined by this scope
ROW	Right-of-Way: A general term denoting land, property, or interest therein, usually in a strip, acquired for or devoted to a highway.
ROWPR	Right-of-Way Plan Review
RTD	Regional Transportation Director
S&C	Standards and Configuration
SAP	SAP is the CDOT Enterprise Resources Planning (ERP) System.
SH	State Highway Numbers
T/E	Threatened and/or Endangered Species
Trns*port	AASHTO sponsored product for preconstruction and construction project management.
TMOSS	Terrain Modeling Survey System
TOPOGRAPHY	In the context of CDOT plans, topography normally refers to existing cultural or man-made details
UD & FCD	Urban Drainage and Flood Control Region

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

ATTACHMENT C
Project Development Systems Inventory

The Project Development Systems Inventory compiled during the assessment effort is provided on the pages, which follow. This partial inventory contains the following information (where available) for each application:

Application-Specific Information

No.	Column Name	Instructions
1	No.	Sequential number for each row
2	Application Name	Name of application. For packaged software, includes the version number or numbers that are currently in use.
3	Developer (Company Name or CDOT Org)	The name of the company that developed the application. If the application has been sold, identify the company currently owning and supporting the application.
4	Estimated Number of End User	The estimated number of users of the application at CDOT.
5	Application Version	The current version of application within CDOT.
6	Operating System	The computer operating system required by the application.

No.	Application Name	Developer	Estimated Number of Users	Application Version	Operating System
1	AutoCAD 2010	Autodesk	15	2010	Windows 7
2	Raster Design 2010	Autodesk	15	2010	Windows 7
3	CulvertMaster	Bentley Systems	15	03.03.00.04	Windows 7
4	Descartes	Bentley Systems	400	08.11.07.426	Windows 7
5	FlowMaster	Bentley Systems	15	08.11.01.03	Windows 7
6	gInt	Bentley Systems	10	08.30.03.77	Windows 7
7	HEC-Pack	Bentley Systems	15	08.11.00.00	Windows7
8	i-Model	Bentley Systems	400	08.11.07.01	
9	InRoads	Bentley Systems	250	08.11.07.428	Windows 7
10	InterPlot Organizer	Bentley Systems	400	08.11.07.420	Windows Server 2003
11	InterPlot Server	Bentley Systems	400	08.11.07.420	Windows Server 2003
12	MicroStation V8i	Bentley Systems	400	08.11.07.443	Windows 7
13	Navigator	Bentley Systems	400	08.11.08.43	Windows 7
14	PondPack	Bentley Systems	15	08.11.01.51	Windows 7
15	Prerequisites	Bentley Systems	400	08.11.07.06	Windows 7
16	ProjectWise Administrator	Bentley Systems	400	08.11.07.443	Windows 7
17	ProjectWise Client	Bentley Systems	400	08.11.09.122	Windows 7
18	ProjectWise Server	Bentley Systems	400	08.11.07.443	Windows Server 2003
19	Publisher (Server)	Bentley Systems	400	08.11.07.406	Windows Server 2003
20	SELECTServer	Bentley Systems	400	08.11.07.111	Windows Server 2003
21	StormCAD	Bentley Systems	15	08.11.02.35	Windows 7
22	View	Bentley Systems	400	08.11.07.440	Windows 7
23	ServerCop	CDOT	400	5.02	Windows 7
24	SignCAD	SignCAD			Windows 7
25	AutoTURN	Transoft Solutions	50	7	Windows 7
26	Acrobat	Adobe Systems Incorporated	400		Windows 7
27	Alphalt 03	CDOT	50		Windows 7
28	CDOT Bridge Geometry	CDOT	40		Windows 7
29	COM624P	CDOT	40		Windows 7
30	Concete 03	CDOT	50		Windows 7
31	CONSPAN		40		Windows 7
32	CONSPLICE		40		Windows 7
33	DARWin-ME		10	1.0.07	Windows 7

No.	Application Name	Developer	Estimated Number of Users	Application Version	Operating System
34	DESCUSI		40		Windows 7
35	DESCUSII		40		Windows 7
36	FB-MULTIPIER		40		Windows 7
37	GEORGIABEAM		40		Windows 7
38	HEC-HMS		15	3.4	Windows 7
39	HEC-RAS		15	4.1	Windows 7
40	HY-8		15	7.2	Windows 7
41	IMBSEN BDS		40		Windows 7
42	LARSA4D	LARSA Inc	40		Windows 7
43	LDFAC		40		Windows 7
44	LEAP RC-PIER	Bentley Systems	40		Windows 7
45	MATHCAD	PTC	40		Windows 7
46	MDSS	Meridian Environmental Technology	100	6.5	Windows 7
47	MDX		40		Windows 7
48	Millennium Asphalt	CDOT	50		Windows 7
49	NC CULVERT		40		Windows 7
50	NEGATIVE MOMENT		40		Windows 7
51	PCA COLUMN		40		Windows 7
52	PLANK		40		Windows 7
53	PONTIS	AASHTO	40		Windows 7
54	ProjectWise	Bentley Systems	400		Windows 7
55	PSG		40		Windows 7
56	SIMON		40		Windows 7
57	SLAB		40		Windows 7
58	Soils	CDOT	50		Windows 7
59	TIMBER		40		Windows 7
60	TPS/ARPS (Permits)	Bentley Systems	15		Windows 7
61	Virtis/Opis 6.2.0	AASHTO	40		Windows 7
62	Virtis/Opis ORACLE CLIENT	AASHTO	40		Windows 7
63	Voids 03	CDOT	50		Windows 7

**PART 2
SCOPE OF WORK
TASK DESCRIPTIONS**

THE COMPLETE SCOPE OF WORK FOR CONSULTANT SERVICES
INCLUDES:

PART 1 - PROJECT SPECIFIC (Which is attached to the Contract for
Consultant Services)

PART 2 - TASK DESCRIPTIONS

**PART 2
PROJECT SPECIFIC
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SECTION 1 WORK TASK DESCRIPTIONS

The following includes work descriptions for all task normally accomplished during this phase of the work.

The tasks that are the responsibility of the Consultant are identified in Part 1 of “Scope of Work”. The Consultant should review this entire section to identify applicable material. Contact the Colorado Department of Transportation Project Manager (CDOT/PM) if clarification is required. (See Section 2.01.)

A. Project Initiation and Continuing Requirements

1. *Initial Project Meeting:* A conference between the Consultant and the CDOT/PM will be held prior to any work being performed.
2. *Project Schedule:*
 - a. Update Implementation Plan: Update implementation plan on a monthly basis and submit with the monthly billing.
 - b. Update 10-year Long Range Plan: Update 10-year long range plan on a yearly basis.
3. *Project Management:* The Consultant will coordinate all the work tasks being accomplished by all parties to ensure project work completion stages are on schedule, in scope, and on budget. They will oversee the overall implementation ensuring all software packages utilized workflows, configuration, support, and training work seamlessly together.
 - a. Oversee Implementation of the CESM Program: Oversee the implementation of the CESM program to ensure complete interoperability between workflows, software programs, configuration, support, and training.
 - b. Workflow and Configuration Consistency: Advise CDOT how to keep workflows and configuration consistent from one specialty group and software product to another.
 - c. Workflow and Configuration Implementation: Advise CDOT when and how to implement various aspects of specialty groups workflows.
 - d. Organize and Sequence Implementation: Advise CDOT on how to best organize and sequence the implementation of the CESM program.
 - e. Organize and maintain communications between project team members. Develop e-mail links so all project team members are included in development communications.
 - f. Schedule and coordinate training courses (dates, times, locations, equipment)
 - g. Maintain and update online training materials.
 - h. Schedule and coordinate support, on-site and telephone
 - i. Schedule and coordinate meetings
 - j. Coordinate with specialty teams
 - k. Manage Consultant team
 - l. Coordinate reports, workflows, configuration, training documents, and online training material.
 - m. Manage quality control
 - n. Attend Meetings
 - o. Coordinate on-site support visits around the State to provide the best efficiency of the program.
4. *Evaluation of Software and Hardware:* Consultant will assist and make recommendations when new software becomes available.
 - a. Throughout the implementation process new versions of software will be available. Assist and make recommendations in evaluating software upgrades and the impacts to the configuration, workflows and CDOT overall computer software environment.

B. Project Development

1. *Communication*: Establish and maintain a computerized list of all appropriate receptors for the communication process. The contacts will be compiled from the general ‘contact list’ below as supplemented by the Project Review Team and the attendees.

The list will be used for notices regarding mailings, or other communications as appropriate.

The information on the list shall include as a minimum:

- Name
- Firm (if applicable)
- Mailing/email address
- Phone/Fax numbers

a. Contact List:

- Public Agencies
- Elected/Appointed Officials
- Consultants
- Specialty Groups

- b. General Meetings: The types and number of meetings shall be flexible and determined by an interactive process as approved by the CDOT/PM.

(1) Weekly Group Meetings.

- a. Meet with CDOT project team or others directly affected by the project work to identify likely impacts and discuss possible mitigation of resolutions. The consultant will lead the meetings or assist CDOT in leading the meetings
- b. Progress Meetings: The CDOT and Consultant Project Manager will meet periodically as required (typically at two-week intervals). Progress Meetings will be used to coordinate and track the work effort and resolve problems. The meetings will review the following:
 - (1) Activities required to be completed since the last meeting.
 - (2) Problems encountered and effectiveness of previous meeting.
 - (3) Late activities.
 - (4) Activities required to be completed by the next meeting.
 - (5) Solutions proposed for unresolved and anticipated.
 - (6) Information or items required from other agencies.

- (2) Monthly Meetings. Meet with CDOT Standards & Configuration team, ProjectWise Task Force or other committees and teams directly affected by the project work to identify likely impacts and discuss possible mitigation of resolutions. The format of these meetings will be dictated by the project and goals for the meetings. The consultant will lead the meetings or assist CDOT in leading the meetings

- (3) Specialty Group Meetings. Meet with CDOT Specialty groups or others directly affected by the project work to identify configuration requirements, workflows, and impacts and discuss possible mitigation of resolutions. The consultant will lead the meetings or assist CDOT in leading the meetings. The format of these meetings will be dictated by the project and goals for the meetings. At each specialty meeting the consultant is to have a subject matter expert available to assist with the meeting, recommendations and discussions.

c. Communication Aids

- (1) Graphics Support. Provide the graphics for presentations. This may include Microsoft Power Point, Visio, maps and plan views of conceptual design, and other displays for visual presentations at meetings.
- (2) Web-site. Assist with their internal and potentially external web-site(s).
 - a. Help develop instructions for MicroStation, InRoads, Survey, ProjectWise, CDOT Workflows, and Specialty groups.
 - b. Development and maintain training web page including Online training, videos and other training resources.
- (3) Local Office. Obtain and maintain an office within the Denver metro to conduct and participate in meetings and coordinate with CDOT staff.

2. *Planning*

- a. Develop 5-year implementation plan. Implementation plan shall build on CDOT's current software, configuration, workflows and training programs to create a complete electronic project delivery system from planning through construction. Plan is to include at a minimum:
 - i. Timelines for the development of the configuration, workflows and training for each specialty group.
 - ii. Sequencing of tasks between specialty groups.
 - iii. Map the most efficient and cost effective way to develop and implement a complete electronic project delivery system from planning through construction.
 - iv. Include end of fiscal year key milestones and others that are developed by specialty groups or other CDOT teams and management.
 - v. Implementation of all the software packages CDOT has identified. More may be added to this list depending on recommendations by CDOT or the Consultant.
 - vi. Implementation of software upgrades and the impact they have to the development of the configuration, workflows, and training.
 - vii. The schedule will be cost loaded.
 - b. Develop 10-year long range plan. Plan is to include at a minimum:
 - i. 5-year implementation plan.
 - ii. Timelines for updating of the configuration, workflows and training for each specialty group.
 - iii. Sequencing of tasks between specialty groups.
 - iv. Map the most efficient and cost effective way to maintain a complete electronic project delivery system from planning through construction.
 - v. Include end of fiscal year key milestones and others that are developed by specialty groups or other CDOT teams and management.
 - vi. Implementation of additional software packages CDOT has identified. More may be added to this list depending on recommendations by CDOT or the Consultant.
 - vii. Implementation of software upgrades and the impact they have to the development of the configuration, workflows, and training.
 - viii. The schedule will be cost loaded.
 - ix. Estimated on-going costs to CDOT due to implementation of software upgrades and the impact they have to the development of the configuration, workflows, and training.
3. *Configuration:* Continue building on CDOT's current configuration to create a complete electronic project delivery system from planning through construction.
- a. Develop CDOT's Configuration: Assist in continuing to develop CDOT's configuration as defined by the Standards and Configuration Committee, ProjectWise Task Force, specialty groups, and CDOT's Design/CAD manager.
 - i. All configuration must be developed free of any copyright or other legal constraints, thereby enabling CDOT to utilize the material when and how it deems appropriate.

- b. Integrate Specialty Groups Needs and Configuration: CDOT is a multi-disciplinary organization and the following specialty groups: planning, survey/ROW, roadway design, hydraulics, traffic/ITS, structures, environmental, utilities, GIS, materials/geotechnical, construction, maintenance, IT, M&S Standards and various CDOT standards groups needs and configuration are to be integrated.
 - c. Integrate Software Programs: CDOT has a wide variety of software programs and configuration that are to be integrated and subject matter experts in one or all of the following may be required. Following is a list of software products that CDOT is currently using. More may be added to this list depending on recommendations by CDOT or the Consultant.
 - (1) Bentley InRoads Survey
 - (2) Bentley MicroStation
 - (3) Bentley InRoads
 - (4) Bentley ProjectWise
 - (5) Bentley iPlot
 - (6) Bentley Navigator
 - (7) Bentley Descartes
 - (8) Bentley Bridge (or similar package)
 - (9) Bentley Storm and Sanitary (or similar package)
 - (10) Bentley Quantity Manager
 - (11) Bentley Standards Checker
 - (12) SignCAD
 - (13) AutoTurn
 - (14) LEAP RC-PIER
 - (15) LEAP CONSPLICE
 - (16) LEAP CONSPAN
 - (17) CulvertMaster
 - (18) StormCAD
 - (19) HEC-Pack
 - (20) PondPack 1 Pond
 - (21) FlowMaster
 - (22) AASHTO Transport
 - (23) AASHTO SiteManager
 - (24) AASHTO Pontis, Opis, Virtis
 - (25) ESRI ArcGIS products
 - (26) SAP Enterprise Resource Planning (ERP)
 - d. Document all configuration decisions.
 - e. Code and quality check the configuration.
 - f. Support the configuration and make fixes.
 - g. Update configuration as a result of CDOT decisions, changes in software, addition of software, and software upgrades.
 - h. Coordinate and work with CDOT's IT department when pushing configuration to CDOT employees or consultants.
4. *Workflows*: Assist in helping CDOT develop workflows.
- a. Provide alternatives, options and workflows so specialty teams can decide on how to best develop the configuration for their needs.
 - b. Assist in developing specialty group workflows. Specialty groups include: planning, survey/ROW, roadway design, hydraulics, traffic/ITS, structures, environmental, utilities, GIS, materials/geotechnical, construction, maintenance, IT, M&S Standards and various CDOT standards groups needs and configuration are to be integrated.

- c. Integrate Specialty Groups Needs and Workflows: CDOT is a multi-disciplinary organization and the following specialty groups: planning, survey/ROW, roadway design, hydraulics, traffic/ITS, structures, environmental, utilities, GIS, materials/geotechnical, construction, maintenance, IT, M&S Standards and various CDOT standards groups needs and configuration are to be integrated.
 - d. Document all workflows to be included in manuals and provide to CDOT to post on their website. All workflows must be developed free of any copyright or other legal constraints, thereby enabling CDOT to utilize the material when and how it deems appropriate.
 - e. Update workflows due to CDOT decisions, changes in software, addition of software, and software upgrades.
5. *Custom Extensions*: Develop custom extensions.
- a. Design and develop custom extensions.
 - b. Implementation of Custom Extensions: Advise when and how to implement custom extensions for specialty groups workflows.
 - c. Develop Functional Specification: Assist CDOT staff with the development of a functional specification.
 - d. Prepare a technical design specification for the custom extension.
 - e. Review the technical design specification with CDOT to obtain approval.
 - f. Code and quality control check custom extensions.
 - g. Support Implementation of Custom Extension: Support the custom extension during Integration Testing, system upgrades, and making fixes as required.
6. *MicroStation/InRoads/ProjectWise Subject Matter Expert*: Provide MicroStation/InRoads and ProjectWise subject expert to assist CDOT Design/CAD manager. The person will be provided an office, computer, and telephone at CDOT headquarters building. Specific tasks include:
- a. Quality Assurance and Testing: Perform quality assurance and testing of the CDOT configuration developed by selected consultant.
 - b. Test Configuration: Test new versions of the configuration prior to release.
 - c. Support Configuration: Support the CESM Project team in configuration improvements and enhancements.
 - d. Identify Problems: Help identify problems and issues with the production configuration and proposed enhancements.
 - e. Assist with Specialized Software Requirements: Assist the CESM team with the definition and documentation of the specialized engineering software requirements of the CDOT specialty groups (Bridge, Hydraulics, etc.) by facilitating workshops and conducting interviews, inventorying requirements and documenting potential solutions for these requirements.
 - f. Assist with Product Selection: Assist the CESM team with product selection and configuration for the CDOT specialty groups.
 - g. Provide Training Recommendations: Review, analyze and make recommendations on configuration and training.
 - h. Assist with Setting Preferences and Standards: Assist the CDOT CESM Standards and Configuration team in setting preferences and workflows.
 - i. Provide support to CDOT users within Denver metropolitan area (or outside Denver at the request of the Design/CAD Manager) as needed. Provide overall support to the CESM team and subcommittees of the CESM team as directed by the Design/CAD Manager.
 - j. Prepare Plan Sheets: Prepare standard CDOT plan sheets in MicroStation that will be used in the production configuration.
 - k. Prepare and conduct demonstrations of the production configuration for presentations.
 - l. Identify Enhancements: Conduct interviews with other consultants as appropriate to help identify potential enhancements to the configuration.

- m. Prepare Web Content about the CESM project to be posted on CDOT Web sites.
- n. Documentation of Meetings and Problem Issues: Prepare meeting minutes and documentation write-ups on known issues related to activities performed.
- o. Coordinate and work with IT and other CDOT departments as related to workflows, configuration, training, and software implementation.
- p. Update and assist with CAD website.

7. *Transportation Subject Matter Expert(s)*: Provide transportation professional expert(s) to assist CDOT Design/CAD manager. If requested by CDOT the person(s) will be provided an office, computer, and telephone at CDOT headquarters building. Specific tasks include:

- a. Provide CDOT with professional specialty expertise in the following areas: freeways, highways, local and rural collectors for municipal and state projects. Must be knowledgeable of CDOT configuration, workflows, plan development, and processes. Experience must include, but is not limited to: scoping, surveying, planning (Environmental Assessments), designing: roadway, drainage traffic, structural, material, geotechnical, utilities, Right-of-Way, construction, plan development, specifications, and estimates (PS&E).
- b. Identify Enhancements: Conduct interviews with CDOT employees and CDOT consultants as appropriate to help identify workflows.
- c. Assist with Developing and Setting Standards: Assist CDOT in developing and setting standards.
- d. Provided extensive coordination between specialty groups for the following: scoping, surveying, planning (Environmental Assessments), designing: roadway, drainage, traffic/ITS, structural, material/geotechnical, utilities, GIS, survey/ROW, construction, plan development, specifications, and estimates (PS&E). Coordination with internal and external team members including consultants, cities, counties, railroads, special interest groups, and concerned citizens.
- e. Provide Training Recommendations: Review, analyze and make recommendations regarding configuration and training.
- f. Provide support to CDOT employees within Denver metropolitan area (or outside Denver at the request of the Design/CAD Manager) as needed. Provide overall support to the CDOT as directed by the Design/CAD Manager.

8. *Support*: Provide statewide support.

- a. Provide Professional Engineers and Professional Land Surveyors as well as other subject matter experts to assist in on-site support to CDOT's residential engineering and headquarters offices. Support visits vary in structure and will depend on the user's needs. They can range from several hours to a several day meeting. They will also vary in numbers of persons.
- b. Provide telephone or other remote support to CDOT users. An inquiry from a CDOT staff member should receive at least the initial response within one hour during CDOT business hours, 7 a.m. to 5 p.m. Monday through Friday.
- c. Evaluate user problems and make recommendations on how to best resolve them (telephone, on-site support, training class, web-based training module).
- d. Provide telephone support to CDOT Consultants that are currently under contract by CDOT.
- e. Develop Plan for Frequently Asked Questions: With information gathered from the various forms of support the consultant shall provide CDOT with frequently asked questions and develop a plan

- on how to best resolve these issues by developing workflows, incorporate into training classes or web modules, etc.
- f. Provide Software Support: Provide support in all the software packages CDOT has identified. More may be added to this list depending on recommendations by CDOT or the Consultant.
 - (1) Bentley InRoads Survey
 - (2) Bentley MicroStation
 - (3) Bentley InRoads
 - (4) Bentley ProjectWise
 - (5) Bentley iPlot
 - (6) Bentley Navigator
 - (7) Bentley Descartes
 - (8) Bentley Bridge (or similar package)
 - (9) Bentley Storm and Sanitary (or similar package)
 - (10) Bentley Quantity Manager
 - (11) Bentley Standards Checker
 - (12) SignCAD (MicroStation integration)
 - (13) AutoTurn (MicroStation integration)
 - g. Support CDOT Staff: Provide CDOT staff support in developing and programming the configuration.
 - h. Keep and maintain activity diaries related to support.
9. Develop Customized Training and Manuals: Develop Customized Training plans, curriculum and manuals.
- a. Prepare detailed training plan(s) for customized course(s) and manual(s).
 - b. Prepare Customized Outlines: Provide Professional Engineers and Professional Land Surveyors as well as other subject matter experts to work with specialty groups to develop and understanding of their needs and prepare detailed customized course outlines and manuals. Consultant will need to coordinate development of customized courses and manuals with CDOT's training committee.
 - c. Develop Custom Materials: All manuals and courseware must be developed free of any copyright or other legal constraints, thereby enabling CDOT to utilize the material when and how it deems appropriate
 - a. Design and develop custom courses, manuals and configure training machines.
 - b. Develop Custom Manuals: Design and develop custom manuals.
10. Provide Customized Training: Provide Statewide customized training
- a. Local Training Facility: Provide and maintain a training facility within the Denver metro to conduct training for CDOT staff.
 - b. Develop Customized Training Manuals: Work with specialty groups and training committee to develop and implement customized manuals specifically for CDOT workflows.
 - c. Provide State wide training to CDOT's residential engineering and headquarters offices. Training classes can range from several hours to a several days.
 - d. Provide Classroom: Provide a suitable classroom environment appropriate for 12 students and networked workstations capable of running all necessary software at an adequate level of performance for a training environment.
 - i. CDOT will provide the Consultant with sufficient software licenses for each Bentley product and InRoads/MicroStation production configuration for installation by the Consultant onto the Consultant supplied hardware.
 - ii. All training facilities must be ADA accessible.

- iii. Class shall be limited to a maximum of twelve students. A minimum of six will be CDOT employees. If the class does not fill and extra seats are available CDOT may offer any remaining slots to Consultant engineering firms or other State and Federal agencies at a reasonable fee that will go to CDOT. If there are less than six CDOT people signed up for the class the class will be cancelled, move to another location, or reclassified to another subject.
- iv. The computer training environment must meet the following minimum requirements:
 - Workstation:
 - 8 GB RAM
 - Graphics card capable of supporting dual monitors
 - Two 17 inch monitors, minimum resolution 1024x768 dpi
 - Ethernet network interface card
 - Windows 7 64 bit or current workstation environment
- d. Update and Maintain Registration System: Update, maintain, and enhance CDOT's existing training course registration system. Consultant must provide CDOT with a list of scheduled/registered and actual attendees for each course upon request.
- e. Provide Course Evaluation Survey: Provide a one-page course evaluation survey at the end of each course and provide a summary of the results to CDOT within five days of course completion. Consultant shall also provide CDOT a summary of survey results for all courses and course types with the monthly billing.
- f. Provide Instructor: Provide one instructor knowledgeable of the material per class.

11. Designing and Developing Online Training Material

- a. Develop, Test, and Implement Online Training Material: Work with training committee and other CDOT staff to develop, test and implement online training material.
 - i. The courseware should generally cover the same scope and depth as the original classroom course, with extensive exercises for participants.
 - ii. Develop and update tutorials from previously developed customized training courses.
 - iii. Instead of a classroom environment and manuals some specialty groups may only require online training material. Consultant shall work with specialty groups and training committee to develop customized online training material for their needs.
 - iv. Courseware shall be developed following industry best practices and use tools enabling CDOT staff (or third party) to efficiently update course material as changes are made to the CDOT configuration and/or upgrades are made to the Bentley software suite. Further, the RFP generally required the selected consultant to provide courseware developed using tools that would enable CDOT staff to make future changes. The Consultant will deliver self-paced training courseware based on industry best practices and CDOT requirements.
 - iv. All courseware must be developed free of any copyright or other legal constraints, thereby enabling CDOT to utilize the material when and how it deems appropriate.
- b. Work with CDOT/OIT departments when online training material to CDOT employees or consultants.
- c. Provide Course Evaluation Survey: Create an evaluation survey for each course. The survey is to be administered electronically at the end of each courseware component and the results provided to CDOT and electronically stored in a manner allowing for retrieval of results upon request.
- d. Update tutorials as a result of CDOT decisions, changes in software, addition of software, and software upgrades.

12. CAD Drafting: Drafting with MicroStation:

- a. Draw to scale using CDOT configuration details in MicroStation.

- (1) All drawings must be developed free of any copyright or other legal constraints, thereby enabling CDOT to utilize the material when and how it deems appropriate.
- b. Update drawings due to CDOT decisions, changes in software, addition of software, and software upgrades.

SECTION 2 SUBMITTALS

A. Reports, Schedules, Studies, Workflows, Manuals, Specifications, Outlines, Surveys, Training Documents, Diaries

All required reports, schedules, studies, workflows, manuals, specifications, outlines, surveys, and training documents shall be submitted in Microsoft Office and Adobe PDF document format and will be submitted for review to the CDOT/PM. Final submittals shall incorporate the corrections and/or revisions resulting from the review. Many of these documents are submitted on a daily, weekly, or monthly basis and will be submitted on mutually agreed upon schedule.

B. Meeting Minutes

The minutes will be completed and will be provided to the CDOT/PM within five (5) working days after the meeting. When a definable task is discussed during a meeting, the minutes will identify the “Action Item”, the agency responsible for accomplishing it, and the proposed completion date. Final submittals shall incorporate the corrections and/or revisions resulting from the review.

C. Agendas of Meetings

The agendas for meetings will be completed and will be provided to the CDOT/PM five (5) working days prior to the meeting. Final submittals shall incorporate the corrections and/or revisions resulting from the review.

D. Electronic Data Submittals

The consultant MUST use the latest CDOT MicroStation/InRoads configuration, directory structure, and file naming conventions in the preparation of all electronic project data.

All consultant drawings shall be prepared using the latest CDOT developed prototype plan drawings and corresponding/supporting drawing cell libraries.

The consultant shall be required to obtain approval from the CDOT Project Manager to deviate from the established CDOT standard configuration in the preparation of the proposed design model(s) and project plan drawings. All modeling and plan preparation deviations approved by the CDOT Project Manager shall be fully documented and all electronic files supporting such deviations shall be submitted as well.

Any project related data in all forms generated by the consultant MUST be able to be reproduced **without error** on CDOT computer equipment, with no further adjustments on the part of CDOT. Project data containing errors shall be repaired by the consultant at no cost to the project.

All material must be submitted to the CDOT Project Manager, from the consultant Project Manager. Acceptance of submitted material is at the sole discretion and responsibility of the CDOT Project Manager.

All custom programs deliverables submittals must include at a minimum computer source codes, executables, compiler version and other related information to complete the submittals. Any custom programs generated by the consultant MUST run without error on CDOT computers, equipment's, and with no further adjustments on the part of CDOT.

1. Computer drawings

MicroStation will be the required drafting package. All plan drawings shall be submitted as a *.dgn electronic drawing prepared using MicroStation/InRoads format. “Master” drawings of the entire ROW plan, Design model(s), etc., from beginning to end shall be included as part of the electronic and hard copy submittals. All master drawings shall be created in “World Coordinates” (to be the same coordinate system used in the survey).

Electronic Plot Files of the plan set in Adobe .PDF file format shall also be provided. The PDF files shall be compatible with the current version of Adobe Acrobat used by CDOT. All material must be submitted to the CDOT Project Manager. All Electronic drawing files and plot files shall be posted to a specified location on ProjectWise, submitted uncompressed or as directed by CDOT Project Manager.

It is suggested that the CDOT Project Manager be contacted prior to creation of electronic media to verify the current submission requirements or to discuss any questions concerning the ability to satisfy the current submission requirements.

CDOT Computer/Software Information. The current desktop computers used by CDOT are Windows 7 64-bit. The consultant will be responsible for maintaining the CDOT configuration based on the latest CDOT desktop requirements. PCs.. The types of software are:

Earthwork:	InRoads (PC based)
Drafting:	MicroStation (PC based)
Survey:	InRoads Survey
Geometry:	Inroads COGO
Bridge:	Staff Bridge software shall be used in either design or design check
Estimating:	TRNS*PORT (Bid Analysis and Management Systems), an AASHTO-sponsored software

2. Computer Data Compatibility

a. Survey information: All terrain and topographic surveys shall be completed utilizing InRoads Survey methodology. The survey data shall be submitted in an edited raw format, free of any and all coding errors.

3. Electronic submittals

CDOT accepts submittals to ProjectWise or as directed by the CDOT Project Manager.

Submittals must follow the directory structure format approved by the CDOT Project Manager. The data and directory structure must require no adjustment before insertion into the CDOT production system.

4. Required documentation: CDOT requires that each unit of the submitted work product be identified and containing the following MINIMUM information as applicable of the information being submitted:

- Computer make, model, and operating system
- CDOT Project Number and CDOT project Manager name
- Date created

Contact Person and telephone number

A letter MUST accompany the electronic media which contains the same information as required on the media AND:

Either contains a description of the operating system commands used to create the electronic media, or an attached computer generated listing of the actual process, which created the electronic media (preferred).

- Configuration Releases
- Custom Extensions
- Online Training Material
- Custom Extensions

5. Workspace and Computer Based Training (CBT) Configuration

To manage changes and avoid duplications, the consultant must develop a version control process that is approved by the CDOT Project Manager.

All deliverable must be certified virus free by the consultant Project Manager.

A "Readme" file must be included with each update containing:

- Summary of the primary benefits of Workspace upgrade.
- New functionality added.
- Changes from previous versions.