

SCOPE OF WORK

PROJECT NUMBERS: IM 392A-012
PROJECT CODES: 16639
CMS ID NUMBERS:
PROJECT LOCATIONS: SH 392 & I-25 Interchange
CONTRACT TYPE: Project Specific
CONTRACT SUBJECT: Construction Management, Inspection and Testing Services

General Requirements

This Scope of Work (SOW) has been carefully reviewed by the Department and reflects a plan of approach based on the known goals. The Consultant's analysis of the project goals, its evaluation of the work elements, and its formulation of the work plan, coupled with its understanding of and sensitivity to the key issues may produce new approaches or modifications to the project's work elements. Therefore, the Final Scope of Work for the project may change in some details to incorporate the Consultant's input. This work is located in Region Four of the Colorado Department of Transportation.

Definitions

Resident Engineer - The CDOT Resident Engineer is responsible to the Region Program Engineer for the quality and successful completion of a transportation project. The Resident Engineer authorizes interim and final payments and all changes to the contracts for all Consultants and Contractors.

Engineer - The CDOT Project Engineer.

Consultant - The individual, firm or corporation under contract by this agreement to perform construction services as outlined below.

Consultant Professional Engineer – The Consultant's Professional Engineer in responsible charge of Consultant services performed as described in this Contract. The Consultant's Professional Engineer must be licensed in the State of Colorado.

Consultant Assistant Project Manager – hereinafter referred to as the "CAPM". A consultant employee who assists the CDOT Engineer in the administration of the CDOT contract with the Contractor. The CAPM works under the responsible charge of the Consultant's Professional Engineer. The CAPM, if a Professional Engineer licensed in the State of Colorado, may be the same person as the Consultant Professional Engineer.

Consultant Inspector/Materials Testing Technician – hereinafter referred to as the "CI/MTT". A consultant employee who performs construction-inspection duties as well as some limited construction-material testing duties.

Consultant Inspector – hereinafter referred to as the "CI". A consultant employee who performs construction-inspection duties.

Consultant Materials Testing Technician – hereinafter referred to as the "CMTT". A consultant employee who performs construction-material testing duties.

Contractor - The individual, firm or corporation under contract with CDOT to construct the facility.

Initial Project Meeting

The Consultant shall meet with CDOT project personnel to coordinate and schedule the required work prior to active construction. The Consultant shall complete all work in accordance with the approved schedule or as approved by the Engineer.

Work Duration

Anticipated Construction: 07/11/2011 to 10/31/2012.

There may be additional work required after 10/31/2012, including work during a period of landscaping, wall-settlement monitoring, etc. The Task Order will cover the period from Notice to Proceed until 10/31/2013, or 90 days after Final Acceptance of the construction project, whichever is later.

For the majority of the project, night work will not be required. Work will be required during the day, on weekends, holidays, and/or on a split-shift basis. For part of the project, night work may be required. Workweeks may be in excess of or less than the standard 40-hour week.

During construction, CDOT anticipates utilizing approximately:

- 1 Consultant Assistant Project Manager (“CAPM”)
- 1 Consultant Inspector/Materials Testing Technician (“CI/MTT”)
- 1 Consultant Inspector (“CI”)
- 1 Consultant Materials Testing Technician (“CMTT”)

Conditions Applicable to all Consultant Personnel: Overtime / Travel Pay / Commute Miles

Overtime hours will be paid by CDOT at the same rate as regular, non-overtime hours. Travel time will not be paid. Commuting mileage (limited to 120 miles per day or actual round-trip commuting distance, whichever is less), will be paid.

Authorization to Proceed

Work shall not commence until the written Notice to Proceed is received by the consultant, and shall be completed in the time specified.

Routine Billing & Reporting

The consultant shall provide the following on a regular basis:

- Monthly billing reports in formats suitable to the Engineer for all contract activities performed by Consultant personnel authorized to perform work on the project.
- Periodic reports and billings required by CDOT Procedural Directive 400.2.

The consultant shall bear all costs related to delay of construction when the Consultant fails to provide qualified personnel when required. The Consultant’s monthly payments may be withheld for that portion of the work for which the consultant personnel fail to provide accurate and timely reporting.

Status of Contract

The consultant shall monitor the fiscal status of the contract, and advise the CDOT Project Engineer of any potential need to supplement the contract. Failure to monitor contract status and provide timely notification may result in discontinuation of the Consultant’s services.

Consultant Professional Engineer Requirements:

The Consultant Professional Engineer shall be available during construction and will be utilized as needed to provide engineering guidance and oversight of the Consultant's employees. The number and types of personnel may be adjusted up or down to meet project workload and Contractor's schedule.

The Consultant Professional Engineer shall meet with the CDOT Project Engineer if it is anticipated that Consultant services may not be required for a period exceeding one week. A procedure shall be agreed upon at the Initial Project Meeting to address this issue.

Requirements for All On-Site Consultant Personnel, including CAPM, CI/MTT, CI, and CMTT:

Each of the Consultant's personnel shall maintain a daily diary for each day they perform work on the project. They shall use CDOT's automated Form 103a - Project Diary unless otherwise directed by the Engineer. The contents of the diary shall be brief and accurate statements of progress and conditions encountered during the prosecution of the work, and sketches as needed for clarification and documentation. Editorial comments are not to be incorporated in the diaries or on any written correspondence applicable to the project. A copy of the daily diary shall be available to the CDOT Project Engineer at the end of each work day.

Requirements for CAPM, CI/MTT, and CI:

Project Standards

All construction inspection shall be in accordance with the Colorado Department of Transportation's Construction Manual, Field Materials Manual, Standard Specifications for Road & Bridge Construction, Standard Special Provisions, Project Special Provisions, and the plans and specifications in use when the project is advertised. All Consultant construction inspection activities shall be as authorized or directed by the Engineer.

General Work Description

The CAPM, CI/MTT, and CI shall provide support to the CDOT project staff and assist with project management and inspection responsibilities. (The CI/MTT shall also perform some materials testing duties, as needed to assist the CMTT, or as otherwise directed). CAPM, CI/MTT, and CI Inspection responsibilities include:

Assist the CDOT Project Engineer in the following construction activities:

- Prepare inspection documentation for development of progress payments for the contractor in accordance with prescribed procedures;
- Submit daily diary at the end of each working day;
- Submit payment-documentation reports (Form 266's) at the end of the working day;
- Prepare periodic reports and billings required by CDOT Procedural Directive 400.2;
- Monitor Contractor payroll compliance;
- Participate in weekly progress meetings with Contractor, subcontractors, utilities and other interested parties;
- Secure project documentation from the Contractor;
- Anticipate project problems and propose solutions to CDOT Project Engineer;
- Review drawings and data submitted by the Contractor and suppliers for conformance with the intent of the specifications;
- Obtain concurrence as needed from the CDOT Project Engineer and keep relative documentation for project records;

- Maintain accurate notes reflecting actual construction details to be used in preparation of as-constructed plans;
- Communicate with adjacent landowners as required to resolve issues that arise due to construction;
- Monitor compliance with and take appropriate action to preserve safety on the project for all workers and traveling public in accordance with the Method of Handling Traffic (MHT);
- Perform initial, follow-up, and final inspections of work in progress including interim and final measurements;
- Notify contractors and CDOT Project Engineer of non-compliance with the contract plans and specifications;
- Perform special tests, investigations, or monitoring to fulfill the intent of the CDOT inspection program;
- Aid in the preparation of correspondence to the Contractor, CDOT Staff, local agencies, etc.;
- Provide liaison and communication to Contractor field crews;
- Prepare final “As-Constructed” plans upon project completion;
- Prepare punch lists of uncompleted work, non-conformance reports, and deficiency notices;
- Prepare responses to Contractors' and suppliers' requests for information, submittals, change notices, claims, and correspondence;
- Prepare and transmit updates of construction activities to the CDOT Public Information Office;
- Perform miscellaneous project-related duties as requested by the CDOT Project Engineer.

Labor, Materials, Vehicles & Equipment

The Consultant shall provide the CAPM, the CI/MTT, and the CI each with the following:

- A suitable vehicle equipped with at least one (1) flashing, oscillating or rotating amber beacon that will be visible a minimum of five hundred (500) feet in normal sunlight.
- Each of these vehicles shall be equipped with an electronic distance-measuring device, calibrated accurate to within +/- 5 feet per mile.
- A cellular phone.
- Each with a state-of-the-art computer with networking capability sufficient for accessing internet email through a project-supplied internet-service provider. Each computer shall be loaded with MS Office software (2003 version or later), including MS Word and MS Excel at a minimum. Computers shall be capable of running current CDOT software, including Asphalt '03, Voids '03, Site Manager, etc. All computers shall be connected or networked sufficiently to enable print-jobs to be sent to a Consultant-supplied project printer, as follows:
 - Consultant shall provide a project printer/scanner capable of making 11x17 color prints, and 11x17 black-and-white scans. This printer shall be so configured and connected or networked as to receive and print print-orders from all consultant-supplied computers on the project. Consultant shall maintain this printer with ink and paper in a serviceable condition for the duration of the project, at no additional cost to the project. Scans made by this printer/scanner shall be available in PDF-format at all consultant-supplied project computers (except not required at CMTT's computer).
- Miscellaneous equipment (calculator, office supplies, safety equipment, etc.) required to perform the work: ASTM Certified Work Boots, ANSI Certified Hardhat (Z89.1 stamp and High Visibility), Safety Glasses (Z87 stamp on the glasses/goggles) and Approved Safety Vest meeting or exceeding ISEA for Class 3.
- CDOT will provide a field-office space.

Personnel qualifications, staffing level, and number and types of vehicles shall be subject to the approval of the Engineer. The Consultant shall assign personnel for the duration of the Contract unless otherwise approved by the Engineer. All consultant personnel will be required to operate motor vehicle and each must possess and maintain a valid State of Colorado driver's license. The CAPM, CI/MTT, and CI shall be

competent in road and bridge construction and shall be thoroughly familiar with CDOT specifications, manuals, forms and documentation requirements. The CAPM shall be thoroughly familiar with CDOT software, including SiteManager. The level of qualification provided shall be as requested and approved by the CDOT Resident Engineer. The qualifications for the level(s) shall be commensurate to experience, and are as follows:

1. CAPM – ten (10) or more years of experience in highway construction project management and supervision of consultant inspectors and testers. It is desirable that the CAPM have at least three years working on projects on the Interstate system.
2. CI/MTT and CI – at least six (6) years of experience in highway construction inspection.

The CAPM shall possess either a NICET Certification Level IV in Highway Construction, an EIT certification from the State of Colorado, or be licensed as a Professional Engineer in the State of Colorado, unless otherwise approved by CDOT. The CI/MTT and the CI shall have either a *National Institute for Certification in Engineering Technology (NICET)* Certification Level III in Highway Construction or have an Engineer-In-Training (EIT) certification from the State of Colorado, unless otherwise approved by CDOT.

A copy of work experience and proof of Certification and/or License shall be provided to the CDOT Project Engineer before work begins. 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 the CDOT Project Engineer.

Requirements for CI/MTT and CMTT:

Project Standards

All sampling, testing, and documentation shall be in accordance with the Colorado Department of Transportation (CDOT) Construction Manual and Field Materials Manual. The applicable CDOT Manual shall be the one currently in use when the construction project is advertised.

If the required method is not described in the CDOT Field Materials Manual, the required work shall be completed in accordance with:

1. AASHTO Standard Specifications for Transportation Materials and Methods of Sampling and Testing (as revised and supplemented), or
2. The ASTM Standards and Tentatives, in this order.

Proposed work procedures shall be coordinated with the CDOT Project Engineer prior to the start of work.

General Work Description

It is anticipated that the CMTT will perform most of the materials-testing duties on the project. However, the CI/MTT will be expected to assist the CMTT whenever required, or when directed by the CDOT Project Engineer or by the CAPM. The CMTT and/or the CI/MTT shall sample, test, and document all materials incorporated into the project. This includes materials delivered to the project that are listed in the Summary of Approximate Quantities or referred to in the Design/Build Plans and Specifications. The number of tests required shall be in accordance with the Schedule in the Field Materials Manual. Additional quantities may be added by Contract Modification Order, or plan approximate quantities may be increased or decreased. The CMTT and the CI/MTT shall review project quantities with the CAPM on a weekly basis to ensure that sufficient tests have been performed for all material placed to date. The consultant shall also provide any other project-related services requested by the CDOT Project Engineer.

Testing of materials that are specifically designated to be pre-inspected or pre-tested by this or any other Department of Transportation shall remain the responsibility of CDOT. The CMTT and/or the CI/MTT shall document and transport samples of any and all materials to the CDOT Region or Central Laboratory that are required to be tested by CDOT, regardless of pre-inspection or pre-testing responsibilities. The items and test frequencies of CDOT-tested materials shall be in accordance with the column titled “Central Laboratory” in the Schedule in the Field Materials Manual.

Labor, Materials, Vehicles & Equipment

The Consultant shall furnish the CMTT with the following:

- A suitable vehicle equipped with at least one (1) flashing, oscillating or rotating amber beacon that will be visible a minimum of five hundred (500) feet in normal sunlight.
- A cellular phone.
- A state-of-the-art computer with networking capability sufficient for accessing internet email through a project-supplied internet-service provider. This computer shall be loaded with MS Office software (2003 version or later), including MS Word and MS Excel at a minimum. This computer shall be capable of running current CDOT software, including Asphalt '03, Voids '03, Site Manager, etc. This computer shall be connected or networked sufficiently to enable print-jobs to be sent to the Consultant-supplied project printer described above, or to a separate 8½” x 11” black-and-white printer provided and maintained by the Consultant in the field laboratory.
- Miscellaneous equipment (calculator, office supplies, safety equipment, etc.) required to perform the work: ASTM Certified Work Boots, ANSI Certified Hardhat (Z89.1 stamp and High Visibility), Safety Glasses (Z87 stamp on the glasses/goggles) and Approved Safety Vest meeting or exceeding ISEA for Class 3.
- CDOT will provide a Class II field laboratory and any required traffic control.

The following equipment shall be furnished along with the CMTT for each project in sufficient quantity and in good working order (with current calibration) to ensure accurate performance of all work required in a timely manner:

- Nuclear Asphalt-Content Gauge;
- Nuclear Moisture/Density Gauge;
- Concrete air meter, slump cone, and other concrete testing equipment;
- Sieves for aggregate and soil gradations;
- Electronic scales;
- Asphalt & A/C sample containers and small tools;
- Proctor equipment for soil curves and one-point tests;
- Atterburg, Rice value, and Sand Equivalent equipment;
- Sample drying equipment;
- Concrete cylinder molds which meet AASHTO requirements, except that paper molds shall not be used, and plastic molds shall not be reused;
- Miscellaneous equipment for performing the required soils, asphalt and concrete tests.

Personnel qualifications, staffing level, and number and types of vehicles shall be subject to the approval of the Engineer. The CI/MTT and the CMTT shall be thoroughly familiar with CDOT specification, manuals, forms, and documentation requirements. The CI/MTT and the CMTT shall be permanently assigned to a project for the duration of the project and shall have the following qualifications:

1. A degree in Engineering from a four year curriculum school or a *National Institute for Certification in Engineering Technology (NICET)* Level II Certification in Construction Materials Testing and Inspection for the types of work being performed, e.g. aggregates, asphalt, concrete, and soils.

2. Any CI/MTT or CMTT performing concrete tests shall be certified by *The American Concrete Institute (ACI)*.
3. Any CI/MTT or CMTT performing hot bituminous pavement tests shall be Level II, A&B certified by *The Colorado Asphalt Technician Certification Program (LabCAT)*.
4. WAQTC, Soils Certification
5. The CI/MTT and the CMTT shall be thoroughly familiar with CDOT specifications, manuals, forms, and documentation requirements.

A copy of work experience and proof of Certification, Degree, and/or License shall be provided to the CDOT Project Engineer before work begins. 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 the CDOT Project Engineer.

Documentation

Test results and sample submittals transmitted to CDOT's Region or Central Laboratory shall be recorded on appropriate CDOT Forms. The CI/MTT and the CMTT may use CDOT worksheets or worksheets approved by the CDOT Project Engineer. CDOT Forms and worksheets are available through the CDOT Project Engineer.

The CMTT shall furnish the CDOT Project Engineer with original copies of all worksheets and test results on a daily basis. The CMTT shall also keep the CDOT Form 626 up to date at all times and provide copies of this form to the CDOT Project Engineer within 12 hours. The CAPM and the CDOT Project Engineer shall be informed immediately of any non-specification material. At the discretion of the CAPM, the CMTT may also be required to provide the CDOT Form 626 to the contractor within 12 hours for any non-specification material.

The CMTT shall provide all correspondence and applicable CDOT forms to the CAPM and/or the CDOT Project Engineer for review and signature.

Assurance Sampling and Testing

The CMTT shall coordinate the schedule of the Independent Assurance Tests (IAT) for the project with the Region Materials Section in accordance with the CDOT Form 379. Advance notice of 48 hours is required for proper coordination.

Submittal of Final Documentation

Final documentation shall be submitted to the CDOT Project Engineer within 20 working days after completion of all work. A completed CDOT Form 250 shall be submitted to the CDOT Project Engineer 10 days after the consultant has been notified of final quantities. Failure to submit final documentation as required will result in withholding of consultant payments.

Table 1: Additional Construction Inspection and Materials Testing Requirements:

In addition to the requirements set forth above, the following certifications will also be required, unless otherwise approved by the CDOT Project Engineer:

Class/Certification	Consultant Assistant Project Manager (“CAPM”)	Consultant Inspector/Materials Testing Technician (“CI/MTT”)	Consultant Inspector (“CI”)	Consultant Materials Testing Technician (“CMTT”)
Basic Highway Math	X *	X	X	X
Basic Construction Surveying	X *	X	X	X
Basic Highway Plan Reading	X *	X	X	X
Storm water Management and Erosion Control	X	X	X	
CCA Traffic Control Supervisor	X	X	X	
Concrete Transportation Construction Inspection	X	X	X	
Specialty Certifications				
NICET Level IV in Highway Construction	X			
NICET Level III in Highway Construction		X	X	
NICET Level II in Construction Materials Testing & Inspection				X
Colo Asphalt Technician Certification LabCAT (Level C includes Volumetrics)		Level A,B,C	Level A,B	Level A,B,C
Asphalt Paving Inspection LabCAT Level I		X	X	X
WAQTC Soils Certification		X	X	X
ACI Field Testing Grade I (including: casting concrete cylinders)		X		X
ACI Field Strength Testing Grade I, <u>or</u> : ACI Lab Testing Technician Level I (including: breaking concrete beams and cylinders)				X

* Not required if certified as an Engineer-in-Training or licensed as a Professional Engineer by the State of Colorado.