

# SCOPE OF WORK

PROJECT NUMBER: **STA 0342-037**  
PROJECT CODE: **13808**  
CMS ID NUMBER:  
PROJECT LOCATION: **US 34 Business from SH 257 to 71<sup>st</sup> Avenue**  
CONTRACT TYPE: **Project Specific Task Specific**  
CONTRACT SUBJECT: **Construction Management, Inspection and Testing Services**

## General Requirements:

This Scope of Work 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.

This is a 4.2 mile long project on US 34 Business from SH 257 to 71<sup>st</sup> Avenue. This is a widening from 2 lanes to 4 lanes. There will be approximately 270,000 cubic yards of embankment, 35,000 cubic yards of ABC, 202,000 square yards of concrete, and 4,300 tons of asphalt.

Assume 20 months to complete the project for 4 people at 50 hours per week plus per diem and hotel. Per diem and hotel will not be considered the day before work starts in a week or the night of the last day of work. Therefore if working Monday through Friday, would have 5 days of per diem and 4 nights of hotel.

Therefore  $87 \text{ weeks/person} (50 \text{ hours/week}) = 4,350 \text{ hours/person}$

Therefore  $87 \text{ weeks/person} (5 \text{ days of per diem/week}) = 435 \text{ days of per diem/person}$

Therefore  $87 \text{ weeks/person} (4 \text{ nights of hotel/week}) = 348 \text{ nights of hotel/person}$

### 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 Project Manager - The Consultant's employee who administers the Consultant contract with CDOT. The Consultant Project Manager works under the responsible charge of the Consultant's Professional Engineer. The Consultant Project Manager, if a Professional Engineer licensed in the State of Colorado, may be the same person as the Consultant Professional Engineer.

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

### Initial Project Meeting

The Consultant and CDOT project personnel shall meet 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**

The time period for the work described in this scope of work covers the period from Notice to Proceed in June, 2008 to January 31, 2010 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 may be required on weekends, holidays, and/or on a split shift basis. Workweeks may be in excess of or less than the standard 40-hour week.

During construction, CDOT anticipates utilizing approximately

- 1 Assistant Consultant Project Manager,
- 1 Consultant Tester,
- 1 Consultant Inspector that will also Assist the Tester,
- 1 Consultant Inspector.

The number and types of personnel may be adjusted up or down to meet project workload and Contractor's schedule. The Consultant 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 resolve this issue.

Note: CDOT does not reimburse for travel time to and from the project, therefore consultants time starts and stops while they are at the project site. CDOT will pay for mileage to and from the project up to a maximum of 25 miles each way which would be a daily maximum of 50 miles per consultant to commute to and from the project. Other mileage driven on the project or special trips to the lab etc will be reimbursed.

The most desirable way to pay for vehicles is \$/day. A less desirable way to pay for vehicles is \$/hour. The least desirable way to pay for vehicles is \$/mile.

### **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 the consultant's assistant project manager, field inspectors, and materials testers authorized to perform work on this 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 whereby 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 for supplementing their contract. Failure to monitor contract status and provide timely notification may result in discontinuation of the Consultant's services.

## **Construction Management and Inspection Requirements:**

### **Project Standards**

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

For the purposes of this document, construction inspection shall be known as "the work" and references to "the

specifications" shall include all applicable CDOT Standard Specifications for Road and Bridge Construction including Project Standard Revisions and Project Special Provisions, and project plans and specifications.

### **General Work Description**

The Consultant shall provide support to the CDOT project staff through assignment of personnel to assist project management/inspection responsibilities. The Assistant Consultant Project Manager will also help manage the other consultants, manage 266's, run the estimate in Site Manager, erosion control inspection, traffic control inspection, and be in charge of the project site while the CDOT Project Engineer is not on site. Inspection responsibilities include:

Assist the CDOT Project Engineer in performance of the following Construction activities:

- Preparing and transmitting updates of construction activities to the CDOT's Public Information Office.
- Monitoring contractor payroll compliance. Will need CDOT training.
- Participation in weekly progress meetings with contractor, subcontractors, utilities and other interested parties.
- Securing project documentation from the contractor.
- Anticipating project problems and directing solutions to CDOT Project Engineer.
- Reviewing drawings and data submitted by the construction contractor and suppliers for conformance with the intent of the specifications. Inform and obtain concurrence as needed from the CDOT Project Engineer and keep relative documentation for project records.
- Maintaining accurate notes reflecting actual construction details to be used in preparation of as-constructed plans.
- Communicating with adjacent landowners as required to resolve issues that arise due to construction.
- Monitoring compliance with and taking appropriate action to preserve safety on the project for all workers and traveling public in accordance with Method of Handling Traffic (MHT).
- Initial, follow up, and final inspections of work in progress including interim and final measurements.
- Notifying contractors and CDOT Project Engineer of non-compliance with the contract plans and specifications.
- Performance of special tests, investigations, or monitoring which are required to fulfill the intent of the CDOT inspection program.
- Preparation of inspection documentation for development of progress payments for the contractor in accordance with prescribed procedures.
- Submittal of standard documentation reports no later than the following working day.
- Aiding in the preparation of correspondence to the contractor, CDOT Staff, local agencies, etc.
- Providing liaison and communication to contractor field crews.
- Preparation of final "As Constructed" plans upon project completion.
- Miscellaneous related duties as requested by the CDOT Project Engineer.
- Assist in preparing punch lists of uncompleted work, non-conformance reports, and deficiency notices.
- Assist in preparing responses to contractors' and suppliers' requests for information, submittals, change notices, claims, and correspondence.

### **Labor, Materials, Vehicles & Equipment**

CDOT will provide field office space. The consultant shall furnish each worker with a suitable vehicle equipped with a flashing amber beacon to be reimbursed as stated earlier unless the vehicle is in the consultants overhead.

The Consultant shall furnish all personnel the following at no additional cost to the project:

- Each with a cellular phone.
- Two total (One for the Assistant Project Manager and one for the Inspectors) state of the art computer w/modem (phone, ISDN or cable as required), writeable CD, 4 gigabyte flash drive, 11"x17" color printer, and loaded with the most current version of MS Office software (& SiteManager for the assistant) as CDOT.
- Each with an internet E-mail address.
- Each with miscellaneous equipment (calculator, office supplies, safety equipment, etc.) required to perform the work (ANSI Certified Work Boots, Certified Hardhat, Safety Glasses and Approved Safety Vest).
- Each with a 10', 25', and 100' tape measure that reads to 0.01 feet.
- Each with a walking wheel to measure in feet.
- Each with a string line and 4' carpenters level.
- Each with CDOT standard spec book and M&S-Standards.

- Pencils, pens, staplers, 2 ring hole punchers, 3 ring hole punchers, clip boards, etc...
- Provide one Level(with set of legs) only that can read 400' away; and one 15' rod and one 25' rod.

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. Employees required to operate vehicles must possess and maintain a valid State of Colorado driver's license. The inspection technician(s) and Assistant Project Manager permanently assigned to a project shall be competent in road and bridge construction and be thoroughly familiar with CDOT specifications, manuals, forms and documentation requirements including Sitemanager. The qualifications for the level(s) shall be commensurate to experience, and are as follows:

1. Assistant Project Manager – 6 or more years of experience in highway construction as a project manager or assistant project manager and supervision of consultant inspectors and testers.
2. Senior Level Inspector that also assists the tester – more than 6 years of experience in highway construction inspection and 3 years experience in testing.
3. Junior Level Inspector – 2 to 6 years of experience in highway construction inspection.

The Consultant's field inspectors 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. The Consultant's Assistant Project Manager shall either have 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.

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.

### **Documentation**

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 approved 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. 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 given to the CDOT Project Engineer within one working day of its date.

## **Construction Materials Testing Requirements:**

### **Project Standards**

All sampling, testing, inspection 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**

The MTT (Materials Testing Technicians) 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 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 MTT, the Consultants Project Manager and CDOT's Project Engineer shall review project quantities 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 services as 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 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**

CDOT will provide a field laboratory. CDOT will provide a concrete compression-testing machine if needed. The consultant shall furnish each worker with a suitable vehicle equipped with a flashing amber beacon to be reimbursed as stated earlier unless the vehicle is in the consultants overhead.

The Consultant shall furnish all personnel the following at no additional cost to the project:

- Each with a cellular phone.
- One total(One for the tester) state of the art computer w/modem (phone, ISDN or cable as required), writeable CD, 4 gigabyte flash drive, 11"x17" color printer, and loaded with the most current version of MS Office software (& SiteManager for the assistant) as CDOT.
- Each with an internet E-mail address.
- Each with miscellaneous equipment (calculator, office supplies, safety equipment, etc.) required to perform the work (ANSI Certified Work Boots, Certified Hardhat, Safety Glasses and Approved Safety Vest).
- Each with a 10', 25', and 100' tape measure that reads to 0.01 feet.
- Each with a walking wheel to measure in feet.
- Each with a string line and 4' carpenters level.
- Each with CDOT standard spec book, M&S-Standards, and Materials Manual.
- Ten 3 ring binders to hold all testing paperwork, and for the 250.
- 100 dividers to insert labels for organization.
- Pencils, pens, staplers, 2 ring hole punchers, 3 ring hole punchers, clip boards, etc...

The following equipment shall be furnished by the consultant tester 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 at no additional cost to the project:

- Nuclear Asphalt Content Gauge.
- Nuclear Moisture-Density Gauge.
- Concrete air meter, slump cone, and other concrete testing equipment.
- Sieves for aggregates and soil gradations.
- Electronic scales.
- Asphalt & A/C sample containers and small tools. CP-41 (section 4.2) of the 2008 field materials manual describes the required safety containers.
- 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.
- Sample bags for embankment and ABC.

Personnel qualifications, staffing level, and number and types of vehicles shall be subject to the approval of the Engineer. The MTT shall be thoroughly familiar with CDOT specification, manuals, forms and documentation requirements. The MTT shall have a minimum of 6 years of experience as a tester, which must include a minimum of 2 years experience on CDOT projects with experience managing a 250 and QPM. The MTT 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. The MTT performing concrete tests shall be certified by *The American Concrete Institute (ACI)*.
3. The MTT 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 MTT shall be thoroughly familiar with CDOT specification, 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**

Each MTT shall maintain a daily diary for each day the MTT performs work on the project. They shall use CDOT's automated Form 103a - Project Diary, or other form approved 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. 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 given to the CDOT Project Engineer within one working day of its date.

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

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

The MTT shall provide all correspondence and applicable CDOT forms to the CDOT Project Engineer or his authorized representative for review and signature.

### **Assurance Sampling and Testing**

The MTT 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.

## Additional Construction Inspection and Materials Testing Requirements:

In addition to the qualifications requirements set forth above, the following certifications will also be required

<b>Class/Certification</b>	<b>Consultant Assistant Project Manager</b>	<b>Consultant Tester</b>	<b>Consultant Senior Level Inspector that also assists the tester</b>	<b>Consultant Junior Level Inspector</b>
Basic Highway Math	X *	X	X	X
Basic Construction Surveying	X *	X	X	X
Basic Highway Plan Reading	X *	X	X	X
Stormwater Management and Erosion Control	X		X	
CCA Traffic Control Supervisor	X		X	X
Concrete Transportation Construction Inspection	X*		X	X
<b>Specialty Certifications</b>				
LabCAT Level A&B		X	Level A only	
Asphalt Paving Inspection LabCat Level I		X	X	
WAQTC		X	X	
ACI Field Testing Tech I		X	X	

\* Not required if the Consultant Assistant Project Manager is a licensed Professional Engineer.