

SCOPE OF WORK
SH 72 PERMANENT FLOOD RECONSTRUCTION
CONSTRUCTION MANAGEMENT (21706/20334)

Scope Date: June 2018
 Estimated Construction Start Date: January 2019
 Region 1

PROJECT NUMBER: ER 072A-040/NHPP 072A-041
PROJECT CODE: 20334/21706
PROJECT LOCATION: SH 72 MP 12.34 to MP 24.00, Coal Creek Canyon, Colorado
CONTRACT TYPE: Project Specific, Specific Rate of Pay
CONTRACT SUBJECT: Construction Management, Inspection and Materials Testing Services

Description and Overview of Project & Required Services

Services are requested to provide Construction Management, Construction Inspection and Construction Testing to support the referenced CDOT Project as follows.

SH 72 Permanent Flood Repairs

ER 072A-040/NHPP 072A-041 is proposing to complete permanent flood repair improvements on SH 72 from milepost 12.34 and milepost 24.00.

The SH 72 Permanent Flood Repairs project has two subaccounts. Subaccount 20334 is the project budgeted with Flood Recovery Office emergency flood relief funding. Subaccount 21706 is budgeted with CDOT's contribution to the project through Surface Treatment dollars.

This project will remove and replace six major culvert structures and nineteen minor culverts (24" to 36"). Four (4) foot shoulder widening will be constructed on the north side of SH 72 (westbound) between mile posts 12.8 and milepost 18.0. Guardrail replacement and minor stream bank hardening are also included in the work.

- Box Culvert replacements at: Milepost 24.03 (10'X6'), Milepost 18.07 (36" to 48"3'X4'), Milepost 16.4 (16'X10'), Milepost 16.2 (16'X10'), Milepost 15 (18'X10'). Milepost 14.0 (18'X10'),
- Minor culvert replacements at: Milepost 24.55, Milepost 22.92 Milepost 22.50. Milepost 19.0, Milepost 18.79, Milepost 18.65, Milepost 18.55, Milepost 18.2, Milepost 17.81, Milepost 16.1 Milepost 15.91, Milepost 15.80, Milepost 15.73, Milepost 15.5, Milepost 15.47, Milepost 15.37, Milepost 15.21, Milepost 13.90, Milepost 13.16
- Stream bank hardening with soil rip ramp from: milepost 18.2 to milepost 18.55, Milepost 16.6
- Guardrail Improvements from: Milepost 17.65 to 17. 2, Milepost 17.4 to Milepost 17.3

- 4' HMA shoulder widening westbound from: Milepost 12.34 to Milepost 18.07

The anticipated project start date is January 2019. The anticipated completion date of construction is December 2020.

The project will be constructed in phases that will allow a majority of the work to proceed during daytime hours. All construction work will be conducted in coordination with property owners to allow access to SH 72 and minimize disruption to the travelling public. Traffic control and public information will be key to the success of the project.

Phasing will also allow the work to be bid in October 2018 without ROW being complete as ROW acquisition will not be completed by advertisement. All areas that will not have full ROW clearance by advertisement will be grayed out but still included in the bid schedule.

The goals for this project include: culvert replacement, guardrail installation, and minor stream improvements along Coal Creek on SH 72 between milepost 12.34 and milepost 24.00. Some shoulder widening and guardrail replacement will improve safety to all project stakeholders and the traveling public, and improve the overall flow of traffic through this important highway corridor.

The Contract Administrator for this Contract will be:

Kevin Brown
Resident Engineer – Region 1 West Program
425 A Corporate Circle
Golden, CO 80401
Office: (720)497-6954
Email: kevin.brown@state.co.us

Active Day to Day administration and monitoring of this contract will be delegated to the following CDOT employee:

Scott Wagner
Project Engineer – Region 1
425 A Corporate Circle
Golden, CO 80401
Office: (303) 501-5047
Email: scottd.wagner@state.co.us

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 1 of the Colorado Department of Transportation.

The positions described herein are anticipated needs. The Department reserves the right to not utilize any of the positions listed or revise the list based on project needs, if at the time of construction the Department has available resources to staff the project from within.

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 Engineer - The Consultant's employee who administers the Consultant contract with CDOT. The Consultant Assistant Project Engineer works under the responsible charge of the Consultant's Professional Engineer or CDOT's Professional Engineer. The Consultant Assistant Project Engineer, 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 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

The time for the work described in this scope of work covers the period from Notice to Proceed to March 15th, 2021 or 90 days after Final Acceptance of the construction project, whichever is later. For portions of the project, night work will be required. Work will also be required during the day, on weekends, holidays, and/or on a split-shift basis. Workweeks may be in excess of or less than the standard 40-hour week. The number and types of personnel may be adjusted up or down to meet project workload. 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.

Anticipated Construction Schedule: January 2019 to December 2020 (subject to change).

During construction, CDOT anticipates utilizing approximately:

- 1 Consultant Assistant Project Engineer**
- 1 Consultant Senior Inspector,**
- 1 Consultant Junior Inspector,**
- 1 Consultant Materials Tester,**
- 1 As needed Safety Critical Engineer,**

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

Overtime hours are not allowable per State Fiscal Rules. Labor Hours will be billed to CDOT at the same rate as regular, non-overtime hours. Travel time will not be paid for travel to and from the project or to and from permanent or temporary residences. Commuting mileage will only be paid for travel to and from the Consultants/Subconsultant's Front Range office. Mileage for travel while on the project will be paid for at the applicable State rate.

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 their contract. Failure to monitor contract status and provide timely notification may result in discontinuation of the Consultant's services. The invoice shall include monthly status reports per the consultant guidelines and shall include budget information.

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 will be agreed upon at the Initial Project meeting to address this issue.

Consultant Assistant Project Engineer Requirements:

Project Standards

The Consultant will provide support to the CDOT Project Engineer through assignment of personnel to construction management. He or she shall be either a Colorado Registered Professional Engineer or non-licensed individual with demonstrable construction administration experience. A non-licensed individual shall be under the direct supervision of a consultant Professional Engineer.

General Work Description

If Consultant procurement precedes project advertisement, the Consultant Assistant Project Engineer shall provide pre-construction support to the CDOT design team, including the Design Consultant already under contract. Pre-construction support services include but are not limited to:

- Review and provide comments on design plans and specifications;
- Attend and participate in the design review meetings;
- Assist CDOT with other duties/tasks as requested;

The Consultant Assistant Project Engineer shall provide support to the CDOT project staff through assignment of personnel to assist with project management and inspection responsibilities.

Responsibilities include but are not limited to:

Assist the CDOT PE and Construction Engineering Staff in the following Construction activities:

- Assist Project Engineer with coordination of all construction contract activities, assist in the supervision of other project staff and assignment of duties and responsibilities;
- Review, give comments, and acknowledge completeness of required submittals resulting from but not limited to:
 - CDOT 205 Permit to Sublet
 - Method of Handling Traffic
 - Progress Schedule
 - Method Statements
 - All EEO Requirements
 - Materials mix designs
 - Shop and Working Drawings
 - Permits
 - EEO, DBE, OJT and other miscellaneous similar documents
 - Project Safety Management Plan and implementation

- All Erosion Control SWMP documentation, reporting, inspections, etc.
- Prepare inspection documentation for development of progress payments for the contractor in accordance with prescribed procedures;
- Maintaining of project files, project diaries and time counts;
- Prepare periodic reports and billings required by CDOT Procedural Directive 400.2;
- Monitor contractor payroll compliance;
- Participate in and ability to facilitate (as necessary) 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 construction 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;
- Communicate with adjacent landowners and other project stakeholders 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 Method of Handling Traffic (MHT);
- Notify contractors and CDOT Project Engineer of non-compliance with the contract plans and specifications;
- 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;
- Change Orders/MCR – discussions with: Contractor, Area Engineer, RE, Specialties as necessary. Also write CMO and justification letter, prepare package with attachments, price justification/negotiation, form 90, etc.
- Ability to prepare responses to contractors' and suppliers' requests for information, submittals, change notices, claims, and correspondence;
- Monitor Contract Time Count
- Assist and/or prepare entirely partial monthly payment Estimates
- Review/Monitor Schedule (baseline, updates and narrative reviews)
- Budget: track all project financial information, notify RE of any/all budgetary concerns, financial tracking form 65's monthly and with each CMO/MCR
- Weekly meetings (agendas, minutes, preparation, facilitation, etc...)
- Pre-con meetings (agendas, minutes, distribution, preparation, facilitation, etc...)
- Review inspectors work (diaries, 266's, DWR's, calculations, spreadsheets, etc...)
- Respond to citizen complaints and CDOT PR office
- Participate in Traffic Control Reviews
- Prepare complete and accurate DWR's/266's
- SiteManager (all pay items, CMO's/MCRs, time count, diaries, stockpiled materials tracking and payment, monthly pay estimates, overs/unders.)
- Review inspectors work (diaries, 266's, DWR's, calculations, spreadsheets, etc...)

- Erosion control management and oversight, bi-weekly reviews, post-storm event reviews, RECAT/ECAT
- Submittal review and approve and forward to specialties as appropriate for review/approval
- Manage the receipt, filing, storage, cataloging and review of all project Contractor Submittals
- Perform miscellaneous project-related duties as requested by the CDOT Project Engineer.

Labor, Materials, Vehicles & Equipment

The Consultant shall provide the Consultant Assistant project engineer with the following:

- A suitable vehicle equipped with at least one (1) flashing, oscillating, or rotating amber beacon that shall be visible from 360° and a minimum of five hundred (500) feet in normal sunlight.
- A cellular phone with texting and voicemail.
- A state-of-the-art computer and printer with networking capability sufficient for accessing internet email through a project-supplied internet-service provider. Each computer shall be loaded with MS Office software (2010 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.
- Miscellaneous equipment (calculator, office supplies, safety equipment, etc.) required to perform the work (ASTM Certified Work Boots, ANSI Certified Hardhat (Z89.1 stamp and be High Visibility), Safety Glasses (Z87 stamp on the glasses/goggles) and Approved Safety Vest. (Meeting or exceeding ISEA for Class 3), including all applicable manuals.
- CDOT will provide 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. Employees required to operate vehicles must possess and maintain a valid State of Colorado driver's license. The Consultant Assistant project engineer(s) 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 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. Assistant Project Engineer – ten (10) or more years of experience in highway construction project management, documentation, and supervision of consultant inspectors and testers.

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

Maintain a daily diary for each day they perform work on the project. He/she shall use CDOT's automated Form 103a - Project Diary unless otherwise directed by the Engineer. He/she shall use CDOT form 1176, erosion control inspection. 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 workday and a copy shall be filed in the project records within one working day of its date.

Consultant Senior Inspector Requirements:

General Work Description

The Consultant Senior Inspector shall provide support to the CDOT project staff through assignment of personnel to assist with project management and inspection responsibilities. Responsibilities include but are not limited to:

Assist the CDOT Project Engineer and Construction Engineering Staff in the following Construction activities:

- Coordination of all construction contract activities as assigned by PE;
- Lead, guide and coordinate all inspection activities and oversee, monitor and provide QA on other inspectors and testers work product;
- Review, give comments, and acknowledge completeness of required submittals resulting from but not limited to:
 - CDOT 205 Permit to Sublet
 - Method of Handling Traffic
 - Progress Schedule
 - Method Statements
 - Misc. required project plans (e.g. Safety, EEO, Environmental
 - All EEO Requirements
- Assist PE in the routing/distribution of submittals requiring specialist reviews (e.g. Hydraulics, Traffic, Environmental, etc...)
- Prepare inspection documentation for development of progress payments for the contractor in accordance with prescribed procedures, review and approve inspection documentation from other inspectors;
- Assist in maintaining of project files, project diaries and time counts;
- Monitor contractor payroll compliance;
- Participate in and ability to facilitate (as needed) weekly progress meetings with contractor, subcontractors, utilities and other project stakeholders;
- Secure project documentation from the contractor;
- Anticipate project problems and propose solutions to CDOT Project Engineer;
- Review drawings and data submitted by the construction 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;
- 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 Method of Handling Traffic (MHT);

- Monitor compliance with and take appropriate action for all required project permits, including but not limited to: CDPS, MS4, Construction Dewatering, etc.;
- Act as Project lead on Storm Water Erosion Control, act as CDOT designated ECS on Project, perform maintain in CDOT CARL computer system and maintain all SWMP notebooks;
- Notify contractors and CDOT Project Engineer of non-compliance with the contract plans and specifications;
- Prepare punch lists of uncompleted work, non-conformance reports, and deficiency notices;
- Ability to prepare and transmit construction activity updates to the CDOT Public Information Office;
- Perform miscellaneous project-related duties as requested by the CDOT Project Engineer.
- Conduct 280 Interviews in accordance with Davis-Bacon Requirements
- Plan and Spec Interpretation (communications with: designers, bridge, utilities, ROW, Traffic, etc...)
- CDOT to Contractor correspondence (letters, 105's...)
- Project Diary/Weather
- Individual diary
- Payrolls/OJT/DBE/Specialized reporting like (1405's, Faster, ARRA, etc...)
- Form 7's/TC and daily hourly pay items
- Form 10's/FA/CMO/MCR
- Traffic Control – management, oversight, review and approve MHT's
- Prepare complete and accurate DWR's/266's
- SiteManager (all pay items, CMO's/MCRs, time count, diaries, stockpiled materials tracking and payment, monthly pay estimates, overs/unders.)
- Review inspectors work (diaries, 266's, DWR's, calculations, spreadsheets, etc...)
- Erosion control management and oversight, bi-weekly reviews, post-storm event reviews, RECAT/ECAT
- Submittal review and approve and forward to specialties as appropriate for review/approval
- Perform miscellaneous project-related duties as requested by the CDOT Project Engineer.

Labor, Materials, Vehicles & Equipment

The Consultant shall provide the Consultant Senior Inspector with the following:

- A suitable vehicle equipped with at least one (1) flashing, oscillating, or rotating amber beacon that shall be visible from 360° and a minimum of five hundred (500) feet in normal sunlight.
- Consultant Senior Inspector's vehicle shall be equipped with an electronic distance-measuring device, accurate to within +/- 5 feet per mile.
- A cellular phone.
- A state-of-the-art computer and printer 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.
- Miscellaneous equipment (calculator, office supplies, safety equipment, etc.) required to perform the work (ASTM Certified Work Boots, ANSI Certified Hardhat (Z89.1 stamp

and be High Visibility), Safety Glasses (Z87 stamp on the glasses/goggles) and Approved Safety Vest. (Meeting or exceeding ISEA for Class 3), including all applicable manuals.

- CDOT will provide 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. Employees required to operate vehicles must possess and maintain a valid State of Colorado driver's license. The Consultant Senior Inspector(s) 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 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:

2. Senior Level Inspector – five (5) or more years of experience in highway construction and some previous experience supervision of consultant inspectors and testers.

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

Maintain a daily diary for each day they perform work on the project. He/she shall use CDOT's automated Form 103a - Project Diary unless otherwise directed by the Engineer. He/she shall use CDOT form 1176, erosion control inspection. 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 workday and a copy shall be filed in the project records within one working day of its date.

Consultant Junior Inspector Requirements:

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, Project Standard 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 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 as amended by Project Standard Provisions, Project Special Provisions, and project plans and specifications.

General Work Description

The Consultant Project Inspector shall provide support to the CDOT project staff through assignment of personnel to inspection activities if requested by the CDOT Resident Engineer. The

Inspector shall be trained and qualified in accordance with CDOT's Construction Inspection Qualification Plan. Inspection responsibilities include but are not limited to:

Assist the CDOT Project Engineer, Assistant Project Engineer and Senior Inspector 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 the working day;
- Submit payment-documentation reports (Form 266's) at the end of the working day;
- Participate in weekly progress meetings with contractor, subcontractors, utilities & other stakeholders;
- Secure project documentation from the contractor;
- Anticipate project problems and propose solutions to CDOT Project Engineer;
- Maintain accurate notes reflecting actual construction details to be used in preparation of as-constructed plans;
- 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;
- Deliver material samples to designated laboratories or locations;
- Perform miscellaneous project-related duties as requested by the CDOT Project Engineer.

Labor, Materials, Vehicles & Equipment

The Consultant shall provide the Consultant Inspector with the following:

- A suitable vehicle equipped with at least one (1) flashing, oscillating, or rotating amber beacon that shall be visible from 360° and a minimum of five hundred (500) feet in normal sunlight.
- Consultant Inspectors vehicle shall each be equipped with an electronic distance-measuring device, accurate to within +/- 5 feet per mile.
- A cellular phone.
- 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.
- Miscellaneous equipment (calculator, office supplies, safety equipment, etc.) required to perform the work (ASTM Certified Work Boots, ANSI Certified Hardhat (Z89.1 stamp and be High Visibility), Safety Glasses (Z87 stamp on the glasses/goggles) and Approved Safety Vest. (Meeting or exceeding ISEA for Class 3), including all applicable manuals.
- CDOT will provide 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. Employees required to operate vehicles must possess and maintain a valid State of Colorado driver's license. The Consultant Inspector(s) 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 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:

3. Junior Level Inspector – two (2) to three (3) years or more of experience in highway construction inspection.

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 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 workday and a copy shall be filed in the project records within one working day of its date.

Consultant Tester (MTT) Requirements:

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, Project Standard 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 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 as amended by Project Standard Provisions, Project Special Provisions, and project plans and specifications.

General Work Description

~~The Consultant Project Inspector shall provide support to the CDOT project staff through assignment of personnel to inspection activities if requested by the CDOT Resident Engineer. The Inspector shall be trained and qualified in accordance with CDOT's Construction Inspection Qualification Plan. Inspection responsibilities include but are not limited to:~~

Assist the CDOT Project Engineer, Assistant Project Engineer, Senior Inspector and Tester 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 the working day;~~
- ~~Submit payment documentation reports (Form 266's) at the end of the working day;~~
- ~~Participate in weekly progress meetings with contractor, subcontractors, utilities & other stakeholders;~~
- ~~Secure project documentation from the contractor;~~
- ~~Anticipate project problems and propose solutions to CDOT Project Engineer;~~
- ~~Maintain accurate notes reflecting actual construction details to be used in preparation of as-constructed plans;~~
- ~~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;~~
- ~~Deliver material samples to designated laboratories or locations;~~
- ~~Perform miscellaneous project related duties as requested by the CDOT Project Engineer;~~
- ~~Ability to assist the Lead Project Tester with all duties, not expected to perform as the lead tester but to provide any assistance to the tester as necessary;~~
- ~~Ability to assist the Assistant project engineer in any and all office related tasks, duties, such as but not limited to: meeting agenda/notes/minutes, filing, record keeping, reports, data entry, etc.~~
- ~~This position will be an as-needed position to be evaluated and agreed upon time frames with the Consultant and the CDOT PE.~~

The MTT shall have successfully completed LIMS training and maintain project documentation using LIMS in SiteManager and other CDOT software as needed. Paperwork for access to LIMS shall be submitted no later than 2 weeks prior to construction NTP.

- Prepare the field laboratory and obtain necessary certification from the Regional Materials Engineer
- Sample, test, inspect and document all materials generated and produced on the project
- Document and transport samples of any and all materials to the CDOT Central Laboratory that are required to be tested by CDOT
- Review project quantities on a weekly basis to ensure that sufficient tests have been performed for the material placed to date
- Prepare CDOT Form 211 to notify the Project Engineer of outstanding documentation
- Coordinate the schedule for Independent Assurance Tests for the project in accordance with CDOT Form 379, with the Region Head Tester, or directly with the Region IAT Staff

- Perform project inspection duties as necessary, during periods of high inspection demand or low material testing demand or a combination thereof

The MTT shall maintain a field lab copy of the CDOT Form 379 that shall be updated after each Independent Assurance Test.

The MTT shall utilize the CDOT Field Materials Manual stipulated on the Project Form 250. The final materials documentation file, including the 473 draft, 1199, and the completed Form 250 shall be submitted to the Project Engineer within 30 Calendar days after the date of project acceptance.

The Form 1199 (Project Closure) is required to be completed, signed and submitted by the Consultant, unless otherwise approved.

Labor, Materials, Vehicles & Equipment

The Consultant shall provide the Consultant Inspector with the following:

- A suitable vehicle equipped with at least one (1) flashing, oscillating, or rotating amber beacon that shall be visible from 360° and a minimum of five hundred (500) feet in normal sunlight.
- Consultant Inspectors vehicle shall each be equipped with an electronic distance-measuring device, accurate to within +/- 5 feet per mile.
- A cellular phone.
- A state-of-the-art computer and printer 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.
- Miscellaneous equipment (calculator, office supplies, safety equipment, etc.) required to perform the work (ASTM Certified Work Boots, ANSI Certified Hardhat (Z89.1 stamp and be High Visibility), Safety Glasses (Z87 stamp on the glasses/goggles) and Approved Safety Vest. (Meeting or exceeding ISEA for Class 3), including all applicable manuals.
- CDOT will provide 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. Employees required to operate vehicles must possess and maintain a valid State of Colorado driver's license. The Consultant Inspector(s) 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 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:

4. Intern Inspector/Tester– six (6) months to three (3) years or more of experience in highway construction inspection.

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 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 workday and a copy shall be filed in the project records within one working day of its date.

Consultant Materials Testing Technician Requirements:

Project Standards

All sampling, testing, inspection, and documentation shall be in accordance with the Colorado Department of Transportation (CDOT) Construction Manual, Field Materials Manual, CDOT M&S Standards, and applicable Project and Standard Special Provisions in the construction project contract and the applicable CDOT Standard Specifications for Road and Bridge Construction. 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 Consultant MTT (Materials Testing Technician) 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 Consultant Project Manager, and CDOT's Project Engineer will review project quantities on a weekly basis to ensure that sufficient tests have been performed for all material placed to date. The MTT will set-up and maintain all materials books. At project completion, a registered P.E. will sign the final form #250 for the

MTT's work. 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 will 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.

The Consultant shall follow the requirements of CP-16 to meet, coordinate and schedule the required work with the Project Engineer, Resident Engineer, and Residency Head Tester. The consultant shall complete all work in accordance with their approved schedule. The consultant materials testing evaluation form shall be completed by the CDOT Project Engineer or Resident Engineer and head tester, and distributed as described in CP-16. The project Engineer shall forward a copy of the completed Pre-Testing Meeting Agenda for Consultant Materials Testing to the Region Materials Engineer.

In addition to the tasks identified in **Consultant Materials Testing Technician Requirements**, the MTT shall assist the Project Engineer in performance of construction inspection activities and other project-related activities, as directed by the Project Engineer, when they are not required to perform the MTT related activities. Inspection responsibilities may include but are not limited to those identified in the **Consultant Project Manager and Consultant Inspector Requirements** above.

Labor, Materials, Vehicles & Equipment

The Consultant shall furnish the Consultant Materials Testing Technician with the following:

- **Consultant shall provide laboratory facilities for Asphalt Ignition Burn-Off testing and Concrete Compression testing. These facilities shall be separate from the CDOT-supplied Class II field laboratory facilities and shall be located off the construction site, at a permanent materials-testing laboratory facility. Compensation for this equipment and testing will not be paid separately but shall be included in the hourly cost of the MTT assigned to the project.**
- A suitable vehicle equipped with at least one (1) flashing, oscillating, or rotating amber beacon that shall be visible from 360° and a minimum of five hundred (500) feet in normal sunlight.
- A cellular phone.
- A state-of-the-art computer and printer 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 to the Consultant-supplied main project printer/scanner described above, or shall be provided with a separate stand-alone printer.
- Miscellaneous equipment (calculator, office supplies, safety equipment, etc.) required to perform the work (ASTM Certified Work Boots, ANSI Certified Hardhat (Z89.1 stamp

and be High Visibility), Safety Glasses (Z87 stamp on the glasses/goggles) and Approved Safety Vest. (Meeting or exceeding ISEA for Class 3) including all applicable manuals.

- CDOT will provide a Class II field laboratory and any required traffic control.

The following equipment shall be furnished along with the MTT 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. Such equipment and supplies shall remain the property of the consultant.

- 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;
- 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.
- Ignition Oven for determining asphalt binder content and RAP gradations meeting specifications of CPL 5120.

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 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 or 7 years of field testing experience with CDOT construction projects.
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. In addition, the Consultant MTT must be certified in the appropriate classes of CDOT's Inspector Qualification Program.
6. Traffic control Supervisory class within the last 3 years.

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

The MTT shall maintain a daily diary for each day the MTT performs work on the project. The MTT shall use CDOT's automated Form 103a - Project Diary, or other form 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 workday.

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.

The MTT shall also be capable of performing project inspection duties as necessary, during periods of high inspection demand or low material testing demand or a combination thereof.

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 30 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:

Post Construction Support

- As-Constructed Drawings: Complete 11”x 17” as-constructed drawings of work completed by the Contractor, including final pay quantities.
- Preparation of Final Pay Estimate: Assist in determining final pay quantities with appropriate supporting documentation and checks.
- Preparation of Materials Final: Prepare the final materials documentation for closing the project.

Project Management

- Progress Reports: Prepare weekly progress reports for the CDOT Resident Engineer documenting project progress in accordance with the Basic Contract.
- Certified Payroll: Review certified payroll documentation provided by the Contractor and conduct random interviews of Contractor employees to determine if the Contractor is in conformance with CDOT’s EEO/Labor Compliance policies.

Deliverables generated during the project will include the following and will be submitted throughout the duration of the project, or at specific dates commensurate with the deliverable’s intent:

- Weekly Progress Reports.
- Project diaries, inspection reports, quantity records, and other documentation prepared during the course of construction in accordance with CDOT requirements.

Schedule Analysis Requirements

General Work Description

- Review the Contractor’s accepted as-planned schedule, schedule updates, and method statements for compliance with contract requirements.
- Perform a schedule delay analysis and determine the amount of Contractor and/or CDOT excusable delays.
- Prepare schedule reports and exhibits to assist in evaluation of schedule delays and remaining as-planned work.
- Provide ongoing schedule review and evaluation support through project completion.
- If needed, assist the project team assemble the data needed to create an as-built schedule

Safety Critical Analysis Requirements

General Work Description

- Review the Contractor’s safety critical work plans, method statements, procedures, etc. for compliance with contract requirements. Provide a written report of each work item to the engineer, with comments and a recommendation to approve, reject/revise/resubmit, or accept with comments.
- Participate in pre-construction meetings for safety critical work items. Assist CDOT in maintaining full-compliance with CDOT policies and procedures and contractual compliance.
- Participate in on-site inspection activities associated with safety critical work items. Assist CDOT in maintaining full-compliance with CDOT policies and procedures and contractual compliance.

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- Assist and review safety critical elements of a special nature as related to rail road requirements, policies, procedures, etc.
- Assist the Engineer in any other areas or special requests.
- Maintain documentation of all safety critical work, analysis, comments, reviews, documentation, etc.
- Be able to attend meetings, give presentations, and provide input and comments as requested.

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

Class/Certification	Consultant Assistant Project Engineer	Consultant Senior Inspector	Consultant Junior Inspector	Consultant Materials Testing Technician
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	
Specialty Certifications				
LabCAT Level A&B				X
Asphalt Paving Inspection LabCAT Level I				X
WAQTC				X
ACI Field Testing Tech I				X

* Not required if the Consultant is a licensed Professional Engineer, or has an Engineering Degree from an accredited institution.

~~Intern Inspector/Tester is entry level and personnel assigned to this position may not be required to possess all of the certification/qualifications, but is progressing in that direction. The Consultant firm and the CDOT PE will review candidates and agree to the assigned personnel in advance.~~