

SCOPE OF WORK

Non-Project Specific Construction Management, Construction Inspection & Materials Testing Services

COLORADO DEPARTMENT OF TRANSPORTATION Western Slope (Regions 3 & 5)

SCOPE OF WORK FOR:

- **I. Construction Management**
- **II. Project Construction Inspection**
- **III. Project Materials Testing**
- **IV. Materials Laboratory Testing**
- **V. Profiling**

Note: This Scope of Work has been carefully reviewed by the Department and reflects an approach based on the known goals of CDOT. 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.

GENERAL REQUIREMENTS

WORK DURATION:

The time period for the work described in this scope is five (5) calendar years.
Work may be required: night or day; weekends; holidays; or on a split shift basis.

Contract Administration

Branch Manager

Markos Atamo, P.E.:
2829 West Howard Place
3rd Floor
Denver, CO 80204
303-757-9592

Active day-to-day administration and monitoring of this contract will be delegated to:

Program Engineer III

TBD

General Requirements:

Definitions:

CDOT Resident Engineer - The CDOT employee 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 Contracts for all Consultants and Contractors.

CDOT Project Engineer - The CDOT employee assigned by the Resident Engineer to be the Chief Engineer's duly authorized representative. The CDOT Project Engineer is in direct charge of the project work and is responsible for the administration and satisfactory completion of the project under contract.

Consultant - The firm or corporation providing personnel under this agreement to perform construction services as outlined herein.

Consultant Professional Engineer - the Consultant employee in responsible charge of Consultant services performed as described in this Contract. The Consultant Professional Engineer administers the Consultant contract must be licensed in the State of Colorado.

Construction Management or Construction Inspector - Consultant employee who performs construction management, construction inspection, and other project-related services under the responsible charge of the Consultant Project Engineer, and at the direction of the CDOT Project Engineer.

Contractor - The individual, firm, or corporation contracting with CDOT to construct a transportation project.

Authorization to Proceed

Work shall not commence until the written Notice to Proceed for a "Task Order" is received by the Consultant. The work shall be completed in the time specified.

I. CONSTRUCTION MANAGEMENT

Initial Project Meeting

The consultant personnel and CDOT project personnel shall meet to coordinate and schedule the required work. The Consultant shall complete all work in accordance with the approved schedule.

Work Duration

NPS Contract Work is for a five year period. Work may be required night and/or 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.

Routine Billing & Reporting

The Consultant shall provide the following on a routine basis:

- a) Coordination of all contract activities by the Consultant's Project Engineer.
- b) Monthly billing formats, suitable to the CDOT Project Engineer, for all contract activities performed by the consultant's Project Engineer and inspectors.

Status of Contract

The Consultant shall monitor the status of the contract and advise the CDOT Resident 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.

Project Standards

Construction Management and Construction Inspection shall be in accordance with the Colorado Department of Transportation's Construction Manual, Field Materials Manual, applicable AASHTO test procedures, Colorado Department of Transportation Inspector's Check-list, Standard Specifications for Road & Bridge Construction, Supplemental Specifications, applicable M&S Standards, and the plans and specifications currently in use when a construction project is advertised. All activities performed shall be as directed and authorized by the CDOT Project Engineer, and as approved by the CDOT Resident Engineer.

Labor, Vehicle, and Equipment: Personnel qualifications, staffing level, and number and types of vehicles shall be as approved by the CDOT Resident Engineer.

The consultant shall furnish all personnel, vehicles, materials, cellular phones, laptop computers, and any and all equipment required to perform the work. CDOT will provide a field laboratory for many of the construction projects and the required traffic control for all of the construction projects.

Authorization to Proceed

Work shall not commence until the consultant receives the written Notice to Proceed for an individual Task Order. Work shall be completed within the allotted contract time. Time charged shall be exclusive of time lost for:

- Reviews and approvals
- Responses/direction from CDOT

Routine Reporting and Billing

The consultant shall provide the following on a routine basis:

- Coordination of all contract activities by the Consultant's Project Manager when required

Status of Project

The consultant shall monitor the status of work, and advise the CDOT Project Engineer/Manager of any potential need for supplementing their contract. Failure to monitor work status and provide timely notification may result in discontinuing the consultant's services relative to the task order until a supplemental agreement can be affected.

The Consultant's work shall be under the direction of, and shall be reviewed by a Professional Engineer registered in the State of Colorado, or as appropriate, by a Licensed Professional Land Surveyor, registered in the State of Colorado.

The inspection technician(s) and/or Project Manager(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. 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. Intern Level Inspector – zero (0) to four (4) years of experience
2. Junior Level Inspector – four (4) to eight (8) years of experience, and experienced in construction management.
3. Senior Level Inspector – more than eight (8) years of experience, and experienced in construction management.
4. Project Manager – six (6) or more years of experience, licensed as a Professional Engineer in the State of Colorado, and responsible for the supervision of the inspectors.

CDOT has developed a Construction Inspector Qualification Program, the following requirements will be mandatory on all CDOT projects after March 1, 2006.

The following chart, with the appropriate checked certifications, shall be included in all scopes of work.

Class/Certification	Consultant Project Engineer	Consultant Inspector	Consultant Tester
Basic Highway Math		X	X
Basic Highway Surveying	X	X	X
Basic Highway Plan Reading	X	X	X
Erosion Control Supervisor	X	X	X
Specialty Certifications	To be determined by the Resident Engineer and Consultant		
CAPA Asphalt Inspection	X	X	X
Asphalt Inspection	X	X	X
WAQTC			X
Major Structures	X	X	
Other (As defined by the RE)			

A copy of work experience, references and/or proof of Licensing shall be provided before work begins to the CDOT Project Engineer. Personnel provided by the Consultant who do not meet 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 on-site project personnel shall maintain a daily diary for each day they perform work on the project. They shall use CDOT Form 103, Project Diary, or a form approved by the CDOT Project 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 shall not be incorporated in the diaries or on any written correspondence applicable to the project. The diary shall not be used for reporting pay quantity documentation. A copy of the daily diary shall be given to the CDOT Project Engineer within one working day of its date.

Personnel Qualifications

The Consultant shall provide a Professional Engineer registered in the State of Colorado, who will be in responsible charge of Construction Observation. This Engineer shall certify in writing that all inspection and Construction Management conforms to the plans, specifications, and purpose of design.

The Consultant Engineer shall be available to review work, resolve problems and make decisions in a timely manner as requested by the CDOT.

The CDOT Resident Engineer shall be the final authority regarding acceptance of work not conforming to the plans. The Consultant Engineer must be experienced and competent in road and bridge construction management and inspection.

The Consultant Engineer and inspector shall provide daily or routine certifications as shown below. The Consultant Engineer in responsible charge of all the Consultant inspectors shall also provide this certification on a monthly basis.

"The items listed above this certification were tested or inspected and found to be in reasonably close conformity to the plans and specifications except as noted".

When performing Construction Management services the Consultant's Professional Engineer shall also provide monthly certifications prior to processing monthly Contractor interim progress payments as shown:

"The construction on this project is being conducted in reasonable close conformance with the plans and specifications". When performing Construction Management services the Consultant's Professional Engineer shall also provide a final certification at the completion of the project as shown:" The project has been completed in reasonably close conformity with the plans and specifications including authorized changes. The project has been reviewed for obvious safety deficiencies. The project Right of Way appears to be free from unauthorized encroachments resulting from construction on this project. The Form FHWA - 47 has been completed and submitted".

Specific Work Description – Consultant Project Engineer

The Consultant Project Management services shall support CDOT's project staff through management of CDOT construction projects. The Consultant Project Manager shall be a Professional Engineer registered in the State of Colorado and will be in responsible charge of Construction Observation.

This Engineer shall certify in writing that all inspection, materials, materials testing, and Construction Management conforms to the plans, specifications and purpose of design. Further, upon submittal of each monthly construction contractor pay estimates to the CDOT Resident Engineer, this Engineer shall provide written certification that "The construction on this project is being conducted in reasonable close conformance with the plans and specifications." This Engineer shall be available to review work, resolve problems and make decisions in a timely manner as requested by CDOT. The Consultant Project Manager shall be experienced and competent in road and bridge construction management, inspection and materials testing.

The CDOT Resident Engineer shall be the final authority regarding acceptance of work not conforming to the plans and specifications. The CDOT Project Engineer, or Resident Engineer in the absence of the CDOT Project Engineer, shall be responsible for signature approval of all construction contract modification orders (CDOT FORM 90) and all construction contract payments.

A Scope of Services detailing the duties and responsibilities of Construction Management responsibilities for each Task Order shall be prepared by the CDOT Resident Engineer. The Scope of Services shall be attached to each Task Order request.

The Consultant Inspector shall assist the CDOT Project Engineer in performance of construction inspection activities and other project-related activities, as directed by the CDOT Project Engineer. Inspection responsibilities may include but are not limited to the following:

- Assist CDOT Project Engineering in the performance of construction inspection activities;
- Review periodic reports and billings;
- Preparing and transmitting updates of construction activities to CDOT's Public Information Office;
- Participation in weekly progress meetings with contractor, subs, utilities, and other interested parties;
- Anticipating project problems and suggesting solutions to the CDOT Project Engineer;
- 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 and the Manual of Uniform Traffic Control Devices;
- Initial, follow-up, completion, and final inspections of work in progress, including interim and final measurements;
- Notifying contractor and 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;
- Completing inspection documentation using CDOT forms for the development of progress

- payments for the contractor in accordance with CDOT's prescribed procedures;
- Submittal of standard documentation reports no later than the following working day;
 - Preparation of routine correspondence to the contractor, CDOT Staff, local agencies, etc.;
 - Providing liaison and communication to contractor field crews;
 - Assisting in preparing punch lists of uncompleted work, non-conformance reports, and deficiency notices.
 - Maintaining accurate field notes during construction reflecting actual construction details to be used in preparation of the as-constructed plans;
 - Miscellaneous project-related duties as directed by the CDOT Project Engineer.

Submittal of Final Documentation:

Final pay documentation shall be submitted to the CDOT Project Engineer within 20 working days after completion of the construction project work. Consultant shall be available to assist Project Engineer and Finals Engineer in correcting documentation and as-constructed plans during the final checking process.

A completed CDOT Form 250 shall be submitted to the CDOT Project Engineer no more than 14 calendar days after the Consultant has been notified of final quantities. Failure to submit final documentation as required will result in withholding of Consultant payments.

ORGANIZANTIAL REFERENCES FOR PERSONNEL CERTIFICATIONS

American Concrete Institute (ACI): Colorado Ready Mix Concrete Association
Ms. Linda Jones PH 303-290-0303
<http://www.crmca.org>

Construction Inspector Certification: Donna Stretz
303-796-4664
FAX: 303-930-6040
donna_stretz@urscorp.com
or <http://www.dot.state.co.us/CHRMEmpCorner/empdev.cfm>

Western Alliance for Quality Transportation
Construction (WAQTC): CK SU
Colorado Department of Transportation
PH 303-398-6587
Cheng.Su@state.co.us

Laboratory for Certification of Asphalt
Technicians (LabCat): Tom Clayton
Rocky Mountain Asphalt Education Center
6880 South Yosemite Court, Suite 110
Centennial, Colorado 80112
PH 303-741-6148
RMAEC@co-asphalt.com

II. PROJECT CONSTRUCTION INSPECTION

In addition to the construction inspection tasks identified in:

I. Construction Management

The construction inspector(s) shall assist the CDOT Project Engineer in performance of construction inspection activities and other project-related activities, as directed by the CDOT Project Engineer. Inspection responsibilities may include but are not limited to the following:

- Reviewing periodic reports and billings
- Participation in weekly progress meetings with contractor, subcontractors, utilities, and other interested parties;
- Anticipating project problems and suggesting solutions to the CDOT Project Engineer
- 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 and the Manual of Uniform Traffic Control Devices;
- Initial, follow-up, completion, and final inspections of work in progress, including interim and final measurements;
- Notifying contractor and Project Engineer of non-compliance with the contract plan and specifications;
- Performance of special tests, investigations, or monitoring which are required to fulfill the intent of the CDOT inspection program;
- Completing inspection documentation using CDOT forms for the development of progress payments for the contractor in accordance with CDOT's prescribed procedures;
- Submittal of standard documentation reports no later than the following working day;
- Preparation of routine correspondence to the contractor, CDOT Staff, local agencies, etc;
- Providing liaison and communication to contractor field crews;
- Assisting in preparing punch lists of uncompleted work, non-conformance reports, and deficiency notices;
- Maintaining accurate field notes during construction reflecting actual construction details to be used in preparation of the as-constructed plans;
- Miscellaneous project-related duties as directed by the CDOT Project Engineer.

Inspection observations shall be documented and approved by the CDOT Project Engineer in accordance with the references cited below under PROJECT STANDARDS. Project specific work will be defined by task order, prior to work commencing.

Management Of Consultant Project Construction Inspection

The consultant, CDOT Project Engineer, and Resident shall meet, coordinate and schedule the required work. The consultant shall complete all work in accordance with their approved schedule.

Project Staffing Authority

The CDOT Project Engineer is in direct charge of the work and is responsible for administration of the project contract as defined in the CDOT Standard Specifications. This includes approving and setting work hours for both project construction and inspection.

Project Standards

All inspection and documentation shall be in accordance with the *Colorado Department of Transportation (CDOT) Field Materials Manual, Construction Manual, CDOT M&S Standards, CDOT Inspector's Checklist* 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 Field Materials Manual*, including *Colorado Procedures and Colorado Procedure-Laboratory*, 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 the *current AASHTO Standard Specifications for Transportation Materials and Methods of Sampling and Testing* (as revised and supplemented) or the *ASTM Standards and Tentatives*. Proposed work procedures shall be coordinated with the CDOT Project Engineer prior to the start of work.

Labor, Materials, and Equipment

The consultant shall furnish all personnel, materials, and equipment required to perform the work in a timely manner:

- Computer with appropriate software
- Clipboard, string line, 4-foot carpenter level
- Miscellaneous equipment to include calculator, officer supplies, and personal safety equipment
- Cell phone
- Project transportation

Special Qualifications For Construction Project Inspectors

The construction inspector(s) must possess a current and valid Colorado Driver's license. The construction inspector(s) must be certified in the areas of inspection to be performed by the CDOT Construction Inspector Qualification Program.

III. General Work Description For Project Materials Testing

The consultant shall sample, test and inspect those specified materials utilized in construction. Test results and inspection observations shall be documented and approved by the CDOT Project Engineer in accordance with the references cited below under PROJECT STANDARDS. Project specific work will be defined by task order, prior to work commencing.

Management Of Consultant Project Materials Testing

The consultant, CDOT Project Engineer, Resident Engineer and Residency Head Tester shall follow the requirements of CP-16 to meet, coordinate and schedule the required work. 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 and head tester, and distributed as described in CP-16. The CDOT Project Engineer shall forward a copy of the completed Pre-Testing Meeting Agenda for Consultant Materials Testing to the Region Materials Engineer.

Project Staffing Authority

The CDOT Project Engineer is in direct charge of the work and is responsible for administration of the project contract as defined in the CDOT Standard Specifications. This includes approving and setting work hours for both project construction and the materials testing.

Project Standards

All sampling, testing, and documentation shall be in accordance with *the Colorado Department of Transportation (CDOT) Field Materials Manual, Construction 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 Field Materials Manual*, including *Colorado Procedures and Colorado Procedure-Laboratory*, 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 the current *AASHTO Standard Specifications for Transportation Materials and Methods of Sampling and Testing* (as revised and supplemented) or the *ASTM Standards and Tentatives*. Proposed work procedures shall be coordinated with the CDOT Project Engineer prior to the start of work.

Labor, Materials, and Equipment

The consultant shall furnish all personnel, materials, and equipment required to perform the work. CDOT will provide a field laboratory for many of the construction projects and the required traffic control for all of the construction projects. The CDOT Project Engineer will advise the consultant on the availability of the field laboratory.

When a field laboratory is not provided, the consultant shall use his own facilities. When the consultant is required to use his own facility, he shall follow the Laboratory Qualification Program requirements contained in the applicable CP-10.

The following equipment and supplies shall be furnished by the consultant for each project in sufficient quantity to ensure performance of all work required in a timely manner. Such equipment and supplies shall remain the property of the consultant.

1. A.C. content gauge and/or extraction equipment and solvents
2. Nuclear Moisture/Density gauge
3. Concrete air meter, slump cone, and other concrete testing equipment
4. Sieves for aggregates and soil gradations
5. Scales
6. Sample containers and small tools
7. Proctor equipment for soil curves and 1 point tests
8. Atterberg equipment
9. Sample drying equipment
10. Miscellaneous equipment for performing the required soils, concrete and asphalt field tests
11. Concrete cylinder molds, which conform to AASHTO requirements, except that PAPER MOLDS SHALL NOT BE USED, AND PLASTIC MOLDS SHALL NOT BE REUSED
12. Cell Phone for each tester
13. Computer and printer for each test lab (CDOT or Consultant). This equipment needs to have capability to operate all current CDOT project software as defined in the current migration plan. This includes Site Manager.
14. Ignition Oven for determining asphalt binder content meeting specifications of CPL 5120.

Personnel staffing level and qualifications of testing personnel and laboratories for the project shall be subject to the approval of the CDOT Project Engineer. The CDOT Project Engineer shall receive and review the testing personnel and consultant laboratory qualifications prior to commencement of testing on the project.

Sampling and testing personnel qualifications shall be in conformance with the requirements of the applicable CP-10. Additionally the tester must possess a current and valid Colorado Driver's license.

The Consultant's work shall be under the direction of, and shall be reviewed, stamped and signed by a Professional Engineer registered in the State of Colorado. The only work to be stamped will be the summary sheets; i.e., CDOT Forms 6, 9, 58, 69, 212, 250, and 554. The Project Engineer may request that additional forms be stamped. The Professional Engineer shall be available to review work, resolve problems, and make decisions in a timely manner as requested by the CDOT Project Engineer, and must be experienced and competent in road and bridge construction materials testing.

Copies of the tester's required certifications and a resume, with references, including his/her materials testing experience shall be provided to the CDOT Project Engineer.

The materials testing technician(s) shall be thoroughly familiar with CDOT testing procedures, forms and documentation requirements. If oversight is necessary, the consultant shall provide the supervision and guidance needed for completion of the work. Oversight required by the consultant will not be paid for by CDOT. The materials testing technician(s) and inspector(s) shall be thoroughly familiar with CDOT forms and documentation requirements.

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. Failure to perform the testing and documentation processes may result in termination of the task order as determined by the Task Order Administrator (Project Manager).

Specific Testing Requirements

The consultant shall sample, test, inspect, and document all materials generated and produced on the project. This includes: materials delivered to the project that are listed in the Summary of Approximate Quantities in accordance with the **SCHEDULE (Quality Assurance)** in the Field Materials Manual; materials that may be added to the project through contract modification; and altered material quantities whether increased or decreased. The consultant's Project Manager, field tester(s) and CDOT's Project Engineer shall be required to review project quantities on a monthly basis to ensure that sufficient tests have been performed for the 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 preinspected or pretested by this or any other Department of Transportation shall remain the responsibility of CDOT. The consultant shall document and transport samples of any and all materials to the CDOT Central Laboratory that are required to be tested by CDOT regardless of preinspection or pretesting responsibilities. The items and test frequencies of Department tested materials shall be in accordance with the column titled "Central Laboratory" in the SCHEDULE.

Documentation

Each of the consultant's field testers shall maintain a daily diary for each day the tester performs work on the project. They may use CDOT's Form 103, Project Diary, or a form as approved by the CDOT Project Engineer. The contents of the diary shall be brief and accurate statement 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 three working days of its date. Test results, sample submittals and inspection documentation transmitted to CDOT's Region or Central Laboratory shall be recorded on appropriate CDOT Forms.

The consultant's Project Manager and field tester(s) shall be required to review project quantities on a weekly basis to ensure that sufficient tests have been performed for the material placed to date. The consultant may use CDOT worksheets or worksheets approved by the CDOT Project Engineer. CDOT Forms and worksheets are available through the Residency Head Tester at no cost to the consultant.

The consultant shall furnish the CDOT Project Engineer with copies of all worksheets on a daily basis. The consultant shall also keep the CDOT Form 626 up to date at all times and provide copies of this form to the CDOT Project Engineer and the contractor within 12 hours for any material found to be out of compliance with the specifications.

The consultant shall coordinate the schedule for Independent Assurance Tests for the project in accordance with CDOT Form 379, with the Residency Head Tester, or directly with the Region IAT person.

Submittal Of Final Documentation

Final documentation shall be submitted to the CDOT Project Engineer within 20 working days after project acceptance. 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 may result in withholding any and all consultant payments.

IV. General Work Description For Region Materials Laboratory Testing

This work consists of materials testing at the Regional Materials Laboratory (potentially located anywhere in Region or an approved laboratory furnished by consultant). Materials testing could involve a wide range of projects consisting of, but not limited to, the resurfacing, reconstruction, maintenance and new construction projects. When the consultant is required to use his own facility, he shall follow the Laboratory Qualification Program requirements contained in the applicable CP-10.

Management Of Consultant Region Laboratory Materials Testing

The consultant, CDOT Region Materials Engineer and CDOT Region Materials Lab Manager shall meet, coordinate and schedule the required work. The consultant shall complete all work in accordance with their approved schedule.

Project Staffing Authority

The CDOT Region Materials Engineer is in direct charge of the work and is responsible for administration of the project contract as defined in the CDOT Standard Specifications. This includes approving and setting work hours for the materials testing.

Project Standards

All sampling, testing, and documentation shall be in accordance with *the Colorado Department of Transportation (CDOT) Field Materials Manual, Construction 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 Field Materials Manual*, including *Colorado Procedures and Colorado Procedure-Laboratory*, 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 the current *AASHTO Standard Specifications for Transportation Materials and Methods of Sampling and Testing* (as revised and supplemented) or the *ASTM Standards and Tentatives*. Proposed work procedures shall be coordinated with the CDOT Project Engineer prior to the start of work.

The consultant tester(s) must meet the requirements of Chapter 800 of the Field Materials Manual, be a minimum of 19 years of age and possess a personnel-monitoring device.

Personnel staffing level and qualifications of testing personnel and laboratories for the project shall be subject to the approval of the CDOT Project Manager. The CDOT Project Manager shall receive and review the testing personnel qualifications prior to commencement of the work. When required, the consultant tester's work may be required to be under the direction of a Professional Engineer in the State of Colorado.

The Professional Engineer shall be available to review work, resolve problems, and make decisions in a timely manner as requested by the Region Materials Engineer. Personnel Staffing level and qualifications of testing personnel and laboratories for this work shall be subject to the approval of the Region Materials Engineer. The Region Materials Engineer shall receive and review the testing personnel and consultant laboratory qualifications prior to commencement of testing.

Activities will include sampling, sample reducing, and testing materials supplied to and/or produced on the projects. This includes but is not limited to performing the following tests:

1. Rice Test (CP 51)
2. Gradations of aggregate (CP 31)
3. Bulk Specific Gravity of cores and/or compacted mix (CP 44 and CP-L 5103)
4. Fine aggregate angularity (CP-L 5113)
5. Hveem Stability (CP-L 5106)
6. Lottman Testing (CP-L 5109)
7. AC Content by Nuclear Method (CP 85)
8. AC Content by Ignition Method (CP-L 5120)
9. Sand Equivalent Test (AASHTO T-176)
10. Liquid Limit and Plasticity Index of Soils (AASHTO T-89, T-90)
11. Moisture Density Relations of Soils (AASHTO T-99, T-180)

Assist with documentation, general cleanup and routine laboratory equipment upkeep as needed. The consultant may enter results into a computer database. The tester(s) may assist the Region Materials lab personnel (using mobile drill rig) in the collection of soil profile data and samples.

Tests will be performed in accordance with the applicable CDOT Field Materials Manual, CDOT Laboratory Manual of Test Procedures, and/or AASHTO Test Procedures. The Region Materials Engineer will determine testing frequency.

The contract tester(s) may be allowed the use of Region Materials Laboratory and all equipment, except for nuclear moisture density gauges, in order to conduct the required testing, when deemed necessary by the Region Materials Engineer. Unless designated, the consultant tester will conduct his/her testing services in the lab provided.

The Region Materials Engineer may designate a member of his staff to represent him in the contract.

SPECIAL QUALIFICATIONS OF REGION LABORATORY MATERIALS TESTER(S)

Tester(s) must have a working knowledge, a minimum of 320 hours relevant experience, and possess and maintain current relevant certifications in the following programs for the duration of the task order:

- *CAPA (LABCAT) asphalt technician* Certification in Levels A and B
- *WAQTC Embankment & Base Testing Technician* Certification
- Tester(s) must possess a current and valid Colorado Driver's License

V PROFILING

The selected Consultant will identify two pavement smoothness testing contractors (PSTC) to be used in the Region.

The PSTC shall supply:

- A high speed profiler (HSP) with a current CP 78 certification
- A HSP operator with a current LabCAT Level S certification

The PSTC shall be capable of mobilizing to a Project within 7 days upon notification by the Department.

The PSTC will collect pavement smoothness data on a Project following the procedures of CP 74 and in compliance CDOT specifications.

The PSTC will submit the pavement smoothness to the Department within 48 hours after it was collected. All data submitted to the Department shall be reviewed by a Professional Engineer for accuracy and completeness. The data may be submitted on either a CD or thumb drive. If the PSTC utilizes a HSP manufactured by International Cybernetics Corp (ICC) the data shall be submitted in the native ICC file format. If the PSTC does not utilize an ICC HSP, the data shall be submitted in a format recognizable by ProVAL 2.7. Along with the pavement smoothness data, the PSTC shall submit a detailed log identifying the location of each exclusion area.

The Consultant shall select which PSTC will be used on a Project. The PSTC shall not perform both QC and QA work on a Project.

PSTC time will be paid hourly to include mobilization time, testing time, demobilization & processing time.