COLORADO
Department of Transportation
Region 1

West Engineering Program
425B Corporate Circle
Golden, CO 80401-5635

CONSTRUCTION MANAGEMENT SCOPE OF WORK

Date: July 22, 2022
CDOT Region 1 West Program

I-70 Bridges over Ward Road

Construction Management, Inspection & Materials Testing Services

267 04703-487 (24473)

Estimated Start Date: November 3, 2023

The Contract Administrator for this Contract will be:

Cody Daigneault, PE
CDOT R1 Resident Engineer
425 A Corporate Circle
Golden, CO 80401
Phone: (720) 628-6919

Active day-to-day administration will be delegated to:

Colleen King, PE
CDOT R1 Project Engineer
425 A Corporate Circle
Golden, CO 80401
Phone: (303) 842-6019

Project Location

Interstate 70 over Ward Road in Wheat Ridge near MP 265.7 (see Figure 1).

Description of Project and Work Duration

This project consists of replacement of existing I-70 bridge structures E-16-JN & E-16-JL originally constructed in 1967 which carry east and westbound, respectively. This project also include milling and HMA overlay on Ward Road from W. 44th Avenue north to the I-70 WB Ramps intersection.

The new bridge (E-16-JA) will be a two-span bridge that utilizes prestressed concrete Colorado Bulb-T (CBT) girders and will be constructed in three phases:

- Phase 1 will construct a portion of the new bridge in the median between the existing structures.
- Phase 2 will then shift westbound traffic to the center portion that had just been constructed. The existing westbound bridge, E-16-JL, will then be demolished and the remaining westbound portion of E-16-JA will be constructed.
- Phase 3 will have east and westbound traffic carried by the constructed portions of E-16-JA. The existing eastbound bridge, E-16-JN, will then be demolished and the remaining eastbound portion of E-16-JA will be constructed.

During all phases, four lanes in both directions will be operational on I-70.

It is anticipated that this project will extend over two construction seasons with an anticipated contract start date in January 9, 2023 and an anticipated completion date of December 20, 2024. Actual construction duration is from approximately January 23, 2023 to October 31, 2024.

While it is anticipated that the majority of the construction for this project will take place during daytime hours with some work on weekends, nights, and holidays.

Consultant's proposed work procedures shall be coordinated with the CDOT Resident Engineer with Formal “Notice to Proceed” prior to the start of work.

Figure 1: Location Map

I. CONSTRUCTION MANAGEMENT

Anticipated Consultant Personnel Requirements

One (1) Assistant Project Engineer
One (1) Senior Bridge Inspector
One (1) Mid-level Inspector
One (1) Junior Inspector
One (1) Materials Tester

Additional project support will also be required for construction schedule reviews, ITS specialist support, finals review, and other support as necessary. Materials testing may need to be supported during busy construction activities. CDOT may provide a Junior Inspector during the project for additional staffing support. An on-call Inspector may be required to jump in during busy weeks when staff is spread over day and nighttime activities. It is preferred that the Materials Tester have Junior Inspector capabilities during times when testing is not needed.

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.

Personnel Qualifications

Personnel qualifications and staffing level shall be subject to the approval of the CDOT Project Engineer. The Consultant shall assign personnel for the duration of the Contract unless otherwise approved by the CDOT Resident Engineer and CDOT Project Engineer. Employees required to operate vehicles must possess and maintain a valid State of Colorado driver's license. The Consultant Project Engineer, Inspectors, and Materials Testers 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 Consultant staff shall have sufficient education, training, and experience to meet the minimum qualifications, and be experienced and competent in all aspects of highway construction within the scope of this project. Personnel who do not meet all 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 Resident Engineer. Back-up Consultant resources should be available in case of loss of staff, sickness, or vacations or as required for the project. **Strong experience in new bridge construction and interstate traffic phasing related to bridge construction is required by the Assistant Project Engineer and Senior Inspector.**

The Consultant Materials Testing Technician shall be thoroughly familiar with the CDOT testing procedures, forms, and documentation requirements (LIMS). If oversight is necessary, the Consultant shall provide supervision and guidance needed for completion of the work.

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, CDOT Laboratory Manual of 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 or revised under advertisement, and as modified by change order.

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

All activities performed shall be as directed and authorized by the CDOT Project Engineer, and as approved by the CDOT Resident Engineer.

Routine Billing & Reporting

The Consultant shall provide the following on a routine basis:

a) Coordination of all contract activities by the Consultant's Assistant Project Engineer.

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

c) Periodic reports and billings required by CDOT Procedural Directive 400.2.

d) Weekly time card for Consultant personnel. The CDOT Project Engineer, prior to billing, must sign these time cards.

Status of Contract

The Consultant shall monitor the status of current spent amount against the Not to Exceed (NTX) Amount of the Agreement and any Task Orders and shall advise the CDOT Resident Engineer of any potential need to supplement the contract or task order NTX Amounts.

Failure to monitor contract status and provide timely notification may result in non-payment and possible discontinuation of the Consultant's services.

AUTHORIZATION TO PROCEED

Work shall not commence until the consultant receives the written Notice to Proceed for the contract or any individual Task Order if Task Order Directed Agreement. 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

STATUS OF PROJECT

The consultant shall monitor the status of work and advise the CDOT Resident 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. Junior Level Inspector – One (1) to three (3) years of experience and experienced in construction management.

2. Mid-Level Inspector – Three (3) to five (5) years of experience and experienced in construction management, inspection, and electronic documentation.

3. Senior Level Inspector – more than five (5) years of experience and experienced in construction management and inspection. Shall be proficient in bridge construction, traffic control/phasing on busy interstates, inspection, and electronic documentation.

4. Assistant Project Engineer – five (5) or more years of experience, and responsible for the supervision of the inspectors. Experience shall include the management of CDOT bridge construction projects and CDOT construction electronic documentation. Experience as a Project Engineer on CDOT bridge replacement project is preferred. Professional Engineering License is preferred.

Please note relevant projects and the roles each individual has played on these projects.

CDOT Consultant Employee Construction Inspector Qualification Program Mandatory Requirements

The following chart, with the appropriate checked certifications, shall be maintained by consultant employees engaged in this type of work performed for the State.

Class/Certification	Consultant Project Engineer	Consultant Inspectors	Consultant Materials Tester
Basic Highway Math	X*	X	X
Basic Highway Surveying	X*	X	X
Basic Highway Plan Reading	X*	X	X
Transportation Erosion Control Supervisor (TECS)	X	X	
CCA Traffic Control Supervisor	X	X	
Specialty Certifications	To be determined by the Resident Engineer and Consultant		
CAPA Asphalt Inspection	X	X	X
Asphalt Inspection	X	X	X
LabCAT Level A & B		Level A	X
WAQTC		X	X
Major Structures	X	X	
ACI Field Testing Tech I		X	X
ACI Concrete Strength			X
SiteManager Materials and LIMS-Tester Training			X
Certified Nuclear Gauge Operator Certification			X
Other(As defined by RE)			

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

A copy of work experience, references and/or proof of Licensing shall be provided before work begins to the CDOT Resident 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 Resident 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/electronic documentation approved by the CDOT Resident 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 Resident Engineer within one working day of its date.

All necessary finals documentation shall be submitted electronically to the CDOT R1 Finals Engineer at the completion of the project.

Personnel Qualifications

The CDOT Resident Engineer and CDOT Project Engineer shall be the final authority regarding

acceptance of work not conforming to the plans. The Consultant Assistant Project Engineer must be experienced and competent in road and bridge construction management and inspection.

The Consultant Assistant Project Engineer and inspectors shall provide daily, or routine certifications as shown below. The CDOT Project Engineer in responsible charge of all the Consultant inspectors shall also provide this certification monthly, and shall certify as follows:

"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".

Specific Work Description – Consultant Assistant Project Engineer

The Consultant Project Management services shall support CDOT staff through management of the I-70 Bridges over Ward Road project. The Consultant Assistant Project Engineer shall be available to review work, resolve problems and make decisions in a timely manner as requested by CDOT. The Consultant Assistant Project Engineer shall be experienced and competent in road and bridge construction management, inspection, and materials testing. Experience administering CDOT projects will be required.

The Consultant shall provide support to the CDOT through assignment of personnel to construction management, construction administration, inspection responsibilities, and materials testing support. Specific responsibilities include:

1. Pre-Construction: Assist with project showings, pre-bid meetings and Q&A's while the project is under advertisement. Complete submittal review, baseline schedule review and other duties as necessary to get the project up and running per CDOT requirements.
2. Meetings: The Consultant personnel shall be present at and assist with the facilitation of all project meetings as required including weekly progress meetings with the Contractor, Subcontractors, utilities, and other interested parties. The Consultant staff shall be required to attend and assist with facilitation of the Project Preconstruction Meeting, Project First Meeting, and other meetings prior to commencement of the project as directed by the CDOT Project Engineer.
3. Documentation: Maintain project submittal register, track project correspondence, track installed quantities, check daily diaries, prepare inspectors progress reports, and complete appropriate CDOT paperwork and forms. The Consultant shall provide all correspondence, and other construction administration documentation required per the CDOT Construction Manual, and applicable CDOT forms to the CDOT Resident Engineer for review and signature. Submittal of standard documentation reports shall be submitted and filed electronically on a weekly basis. Trialing and tracking field contractor activities might be required in the Survey123 Application.
4. Project Schedules: Review of Contractor schedules in accordance to 108.03 of the Standard Specifications.
5. Quality / Conformance with Plans and Specifications: Monitor and inspect the Contractor's construction activities with respect to the contract documents and relevant schedule submittals governing the performance of the work. Resolve construction problems and/or recommend action for their resolution, as they relate to changed field conditions or conflicts in the contract documents. Perform special tests, investigations, or monitoring to fulfill the intent of the CDOT inspection program. Notify Contractor and CDOT Resident Engineer of non-compliance with the contract documents.
6. Submittals and Shop Drawings: Submittals, design drawings, shop drawings, working

drawings, materials, and test procedures received from the Contractor will be reviewed and/or forwarded to appropriate CDOT personnel for review. Approved drawings will be returned to the Contractor, as well as a copy retained for use during the remainder of the project.

7. Methods of Handling Traffic (MHT) / Safety: Review the Contractor's Method(s) of Handling Traffic (MHT) submittals. During construction, monitor the Contractor's MHT for implementation of traffic signing, barriers, and other traffic control measures in accordance with the approved plan. Monitor 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).
8. Quantity Tracking: Perform daily inspections of construction activities to document activities performed and assessment of conformance with the contract documents. Quantities of work elements constructed will be measured in accordance with the CDOT Construction Manual and recorded on an electronic Form 266 to support the preparation and processing of progress pay estimates to the Contractor. Quantities will be documented in an interim quantity spreadsheet for tracking of quantities constructed as compared to the original design quantities on the project. Quantities of work will be agreed upon with the Contractor and then reflected in monthly progress pay estimates prepared by the Consultant's staff. Assist CDOT in resolving disputes in quantities with the Contractor prior to the preparation of the pay estimate.
9. Pay Estimates: Determine quantities with appropriate supporting documentation and checks and prepares pay estimates in Site Manager.
10. Daily Diaries: Consultant's personnel shall maintain a daily diary for each day they perform work on the project. They shall use CDOT's Form 103a - Project Diary, unless otherwise approved by the CDOT Project Engineer. Use of the digital Form 103 through the Survey123 Application may be required. 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.
11. Change Orders: Capable of preparing project change orders and minor contract revisions as necessary, justification for CMO's and MCR's, price justification (Force Account Analysis) per the CDOT Construction Manual.
12. Civil Rights Compliance: Review certified payroll documentation in LCP Tracker provided by the Contractor and conduct random interviews of Contractor employees to determine if the Contractor is in conformance with CDOT EEO/Labor Compliance policies. Review 205's and sublet compliance in B2GNow.
13. Stormwater Management: Inspect erosion control, review SWMP notebook, and participate in Erosion Control Compliance Reviews.
14. Check Surveying: Provide quality control surveying and quantity verification as needed. If the Construction Contract includes a Construction Surveying pay item, then the Contractor is responsible for performing all surveying required to properly layout and constructs the work covered.
15. Completion, Inspection, and Punch List: Participate in the final inspection with the Contractor, CDOT Project Engineer, CDOT Resident Engineer and CDOT Maintenance representative(s) upon substantial completion. The result of the inspection is the development of a punch list of remaining and/or outstanding work to be performed by the Contractor prior to final project acceptance.
16. As-Constructed Drawings: Maintaining accurate notes reflecting actual construction details to be used in preparation of as-constructed plans. Complete as-constructed drawings of work

completed by the Contractor including final pay quantities.

17. Completion Inspection and Close-Out: Following the completion of all punch list items by the Contractor, participate in the final inspection with representatives from the Contractor and CDOT, to confirm the completion of all work. The result of this inspection will constitute final project acceptance.
18. Communication: Provide communication to Contractor field crews. Communicate with adjacent landowners as required to-resolve issues that arise due to construction.
19. Miscellaneous project related duties as requested by the CDOT Resident Engineer or other CDOT units.
20. Project documentation shall be stored in a shared drive such as Google Drive or other approved application. At the end of the project, all required finals documentation shall be transferred to CDOT's ProjectWise on premise or the ProjectWise Cloud system by the Consultant.

The CDOT Project Engineer shall be the final authority regarding acceptance of work not conforming to the plans and specifications. The CDOT Project Engineer, or Resident 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 Project or Resident Engineer. The Scope of Services shall be attached to each Task Order request.

The Consultant 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 and/or the CDOT Resident Engineer.

Inspection responsibilities may include but are not limited to the following:

- Assist CDOT Project Engineer 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 and/or CDOT Resident 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.
- Other ~ Miscellaneous project-related duties as directed by the CDOT Project Engineer and/or CDOT Resident Engineer.
- References to "the specifications" shall include all applicable CDOT Standard Specifications for Road and Bridge Construction including Supplemental Specifications, Project Standard Revisions and Project Special Provisions, and project plans and specifications.

Submittal of Final Documentation

Final pay documentation shall be submitted to the CDOT Resident Engineer within 20 working days after completion of the construction project work. Consultant shall be available to finalize the project. This includes assisting the CDOT Project Engineer and Finals Engineer in obtaining and correcting documentation and completing as-constructed plans during the final checking process. All documentation shall be completed electronically and placed on CDOT's ProjectWise Cloud server. This shall be completed within 45-days of project acceptance.

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.

ORGANIZATIONAL 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: **Construction Management**

The construction inspector(s) shall assist the CDOT Resident Engineer in performance of construction inspection activities and other project-related activities, as directed by the CDOT Resident 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 Engineer 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, VEHICLES, MATERIALS, 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, 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.

FIELD LABORATORY

The Contractor will provide a field laboratory for many of the construction projects and the required traffic control for all of the construction projects. 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 Asphalt Content Gauge
3. Nuclear Moisture/Density gauge
4. Concrete air meter, slump cone, and other concrete testing equipment
5. Sieves for aggregates and soil gradations
6. Scales
7. Asphalt & A/C sample containers and small tools
8. Proctor equipment for soil curves and 1 point tests
9. Atterberg, Rice Value, and Sand Equivalent equipment
10. Sample drying equipment
11. Miscellaneous equipment for performing the required soils, concrete and asphalt field tests
12. Concrete cylinder molds, which conform to AASHTO requirements, except that PAPER MOLDS SHALL NOT BE USED, AND PLASTIC MOLDS SHALL NOT BE REUSED
13. Cell Phone for each tester
14. 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.
15. 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 CDOT 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 pre-inspected 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 pre-inspection 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 Finals Engineer within 45 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
- ACI field testing and concrete strength certifications
- Tester(s) must possess a current and valid Colorado Driver's License