

## EXHIBIT A

### Bridge Construction Inspection and Fabrication Inspection of Structural Elements

#### SCOPE OF WORK

##### **Contract Administration**

Staff Bridge, Fabrication/Construction Engineer: Denver, CO 80204

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

Staff Bridge, Fabrication/Construction Engineer: Denver, CO 80204

##### **General Requirements:**

##### **Definitions:**

CDOT - Colorado Department of Transportation

CDOT Resident Engineer - The CDOT employee responsible to the Region Program Engineer for the quality and successful completion of a transportation project.

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.

CDOT Fabrication/Construction Engineer – The CDOT employee responsible for the project or task order. The CDOT Fabrication/Construction Engineer authorizes interim and final payments and all changes to Contracts for all Consultants.

Consultant - The firm or corporation providing personnel under this agreement to perform Inspection 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 administering the Consultant contract must be licensed in the State of Colorado.

Inspection Management or Fabricator Inspector - Consultant employee who performs inspection management, fabrication 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.

##### **Labor, Vehicles, and Equipment:**

The Consultant shall furnish the office space, vehicles, cellular phones, tools, equipment, and personal protective equipment required to perform the work. CDOT will NOT furnish any other equipment

required to perform the work. The Consultant's work shall be under the direction of, and shall be reviewed by a Professional Engineer registered in the State of Colorado.

The Consultant shall provide all testing equipment necessary to verify the Fabricator's Quality Control and the documentation to indicate whether the fabricated item conforms to the requirements of the contract.

A copy of work experience, certifications, proof of licensing required for the work shall be provided to the CDOT Project Engineer before the work begins. 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.

#### **Authorization to Proceed**

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

#### **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 four-year period with the option to extend a fifth year to complete existing work under contract. Work may be required night and/or day, on weekends, holidays, and/or on a split shift basis. Work weeks 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.
- c) Periodic reports and billings required by CDOT Procedural Directive 400.2.

#### **Submittal of Final Documentation:**

Final pay documentation shall be submitted to the CDOT Fabrication/Construction Engineer within 20 working days after completion of the work. Failure to submit final documentation as required will result in withholding of Consultant payments.

#### **Contract Status**

The Consultant shall monitor contract status 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.

#### **Referenced Documents**

- a) CDOT Standard Specifications for Road and Bridge Construction

- b) CDOT Construction Manual
- c) CDOT Materials Manual
- d) CDOT Pre-stressed & Precast Concrete Fabrication Inspection Manual
- e) CDOT Structural Steel Fabrication Inspection Manual
- f) CDOT M&S Standards
- g) CDOT Bridge Design Manual
- h) Precast/Prestressed Concrete Institute (PCI) MNL-116 Fourth Edition 1999

## **1. Program Development and Support Scope Items**

### **Develop Structure Construction Inspection Training**

Develop Structure Construction Inspector Training. Present the developed training three times the first year and twice a year thereafter. Produce the training materials and content needed to support the training. The training materials shall include but not be limited to paper documents, electronic documents, videos, and training participant tests. The inspection training is to include but not be limited to: structure excavation, drilled shaft construction, steel piling placement, reinforcing steel placement, concrete form construction, concrete placement, bearing device placement, concrete girder camber, concrete girder erection, structural steel bolted connections, structural steel welding, steel girder erection, deck form placement, concrete deck placement, expansion device installation, bridge rail placement, waterproofing membrane placement, thin-bonded overlay placement, and HMA wearing course placement.

The training is to be updated annually based on the identified construction related issues in order to improve structure construction inspection.

### **Define Structure Inspection Requirements and Reporting**

Define the structure construction operations within a typical project that require inspection and reporting. Define the structure construction operations within a typical project that are recommended for inspection and reporting. Develop a listing of required documentation for each structure construction operation. Define the inspection reporting required for each structure construction operation.

### **Develop Project Structure Inspection Prioritization**

Develop project prioritization criteria to optimize the inspection resource scheduling that ensures appropriate inspection expertise is available at structure construction operations. The prioritization is to consider risk based on: past project findings, consequences of failure, project vulnerability, project cost, user impacts (e.g. annual average daily traffic), expectations on life of the asset, criticality of the bridge members, project delivery team experience, and Contractor past performance.

### **Develop Project Findings Tracking Database and Report**

Develop a tracking database for bridge projects that includes major structure work details and findings. The tracking database is to include but not be limited to: project findings, project related construction

issues, common issues among projects, key bridge measurements, key fabricated element measurements, assurance of complete required documents, recommendations on areas for improvement, and training opportunities. Collecting and managing of photos and other official project delivery documents (e.g. diaries, test reports, camber measurements, etc.) outside of the project folders in supporting the collected data in the tracker will be required.

Develop a report that summarizes the data, findings, common construction related issues, areas for improvement, and recommend training needs.

### **Development of an Ongoing Project Support Resource Management Plan and Schedule**

Develop resource allocation plans utilizing the Project Finding Database and Report, and the Project Structure Inspection Prioritization. The resource allocation plan shall support projects statewide. The plan will be delivered and used by the project manager. A plan delivery report will be created to detail the effectiveness of the program and identify the improvements and needs to the state construction support.

The plan will address recommendation on scheduling available project support resources with considerations including but not be limited to:

The prioritization plan, project delivery milestones for bridges, current operations, available construction support resources and schedule, regional expertise and support needs, and ensuring the efficiency in the delivery of the construction funds spent in the state.

### **Fabrication Plant Inventory and Audit Inspection Policy**

Develop a fabrication plant inventory for those fabrication plants that supply CDOT Projects with structural elements. Develop a fabrication plant audit inspection requirements policy and an audit inspection schedule. The policy shall define the documentation required by the fabrication plant. The inventory is to include the tracking of the required documentation and when the documentation expires.

## **2. Ongoing Construction Support Services Scope Items**

### **Construction Inspection Services**

Construction Inspection Services shall be in accordance with the above Referenced Documents, project plans, and project specifications. All activities performed shall be as directed and authorized by the CDOT Project Engineer, and as approved by the CDOT Fabrication/Construction Engineer.

### **Quality Assurance (QA) Fabrication Inspection**

Quality Assurance Fabrication Inspection shall be in accordance with the above Referenced Documents, project plans, and project specifications. All activities performed shall be as directed and authorized by the CDOT Project Engineer, and as approved by the CDOT Fabrication/Construction Engineer.

#### **QA Fabrication Inspection Items**

QA Fabrication Inspection of the following typical structural components to be incorporated into CDOT construction projects:

Item 504, MSE Wall, Blocks and Panel

Item 509, Structural Steel

Item 512, Bridge Bearing Device, Type III

Item 518, Bridge Expansion Devices, Modular (0-6" and greater)

Item 522, Structural Steel Coatings

Item 606, Bridge Rail

Item 607, Fence Concrete (Sound Barrier)

Item 614, Traffic Signal Poles, Sign Structures or Sign Bridges

Item 618, Prestressed Concrete Girders and Deck Panels

#### **QA Fabrication Inspection Documentation**

Documentation shall be in accordance with the above referenced documents, and the respective project plans and specifications.

The Consultant performing quality assurance inspection of precast/prestressed concrete elements shall mark each inspected item that it is approved for installation prior to shipment from the fabrication plant using the CDOT QA ink stamp. All non-conformance or quality issues shall be documented and submitted to the Consultant Professional Engineer for review. All structural issues shall be forwarded to the CDOT Fabrication/Construction Engineer. A completed CDOT Form# 193 shall be submitted by the Consultant Professional Engineer to the CDOT Project Engineer between seven and fourteen days prior to shipment of structural components.

The Consultant performing quality assurance inspection of structural steel fabricated elements at the fabrication plant shall provide complete documentation of the entire fabrication process including personnel qualifications, evidence of origin, material certifications and test reports, cutting, welding, bolting and fit-up as inspection availability and schedule permits. All non-conformance or quality issues shall be documented and submitted to the Consultant Professional Engineer, CDOT Project Engineer and the CDOT Fabrication/Construction Engineer. When 100% quality assurance inspection is not feasible the CDOT Form #193 shall be completed upon visual inspection of the element at the project site and submitted to the CDOT Project Engineer.

#### **QA Fabrication Inspection Personnel Qualifications**

The Consultant performing Quality Assurance (QA) inspection for structural items fabricated off the project site in a Fabricator's facility shall possess the following certifications:

For Precast Concrete: ACI Concrete Field Testing Technician-Grade I

For Structural Steel: CWI (ASNT Level II (or higher) in UT, PT, and MT) if Non Destructive Testing (NDT) is required

For Precast/Prestressed Concrete: PCI Level I/II (or higher) and ACI Concrete Field Testing Technician-Grade I

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

The Consultant Engineer, when performing Inspection Management Services, shall provide verification of Inspector Certification at the start of each project. The Consultant Engineer shall be available to review work, resolve problems and make decisions in a timely manner as requested by CDOT. The CDOT Resident Engineer shall be the final authority regarding acceptance of work not conforming to the plans and specifications with oversight provided by the CDOT Fabrication/Construction Engineer. The Consultant Engineer must be experienced and competent in inspection management and fabrication inspection.

#### **Fabrication Plant Audit Services**

Perform fabrication plant audits based on the fabrication plant audit inspection requirements policy as directed by the CDOT Fabrication/Construction Engineer.

#### **On-Call Emergency Inspection Services**

Perform on-call emergency construction or fabrication inspection services as directed by the CDOT Resident Engineer, CDOT Project Engineer or CDOT Fabrication/Construction Engineer.

#### **General Services**

Provide general services, related scope and additional tasks as defined by the Project Manager or CDOT Fabrication/Construction Engineer.