

**TASK ORDER SCOPE OF WORK
EASTERN PLAINS TIMBER BRIDGE REPLACEMENT
ENGINEERING SUPPORT SERVICES**

CONTRACT TYPE
 Specific Rate of Pay
 Cost Plus Fixed Fee
 Other

CONTRACT DATE: October 14, 2021

PROJECT NUMBER: FBR 0061-092

PROJECT LOCATION: US 6 and US 385 Timber Bridge Replacements

PROJECT CODE: 22529

Background and Purpose

Region 4 (Sterling Residency) requires design services for the replacement of three (3) timber structures in Phillips county, Colorado. Based on discussions with Region 4 staff, CDOT is requesting engineering design services to compile the complete set of plans including the storm water management sheets, specifications, and estimate costs that are required for advertisement by CDOT. The project delivery method will be Design Bid Build. The table below indicates the structure, location, and services required:

Bridge Location				Services Required					
				Roadway	Bridge	Hyd.	Traffic	Utilities	Wetland CAD
Str. ID	HWY	Town	MP	Design	Detail	Support	Design	SUE	SWMP
B-27-D	US 6J	Holyoke	453.102	x	x	x	x	x	x
B-27-F	US 6J	Holyoke	455.766	x	x	x	x	x	x
A-27-A	US 385D	Holyoke	291.481	x	x	x	x	x	x

SCOPE OF SERVICES

Meetings

1. Task Order Meetings

- CDOT and the consultant project managers (PMs) will meet biweekly to at least monthly; to assess and monitor overall task order progress and budget, and make

any needed decisions. Progress meetings can be held in-person or via teleconference.

2. Project Meetings

- A project Design Initiation meeting will be scheduled and conducted with appropriate stakeholders and specialty units. It is anticipated that the design initiation meeting will be held soon after the notice to proceed has been issued.
- An FIR meeting will be conducted in September of 2022 with appropriate stakeholders and specialty units.
- An FOR meeting will be conducted in June 2023, with appropriate stakeholders and specialty units.
- Up to four (4) additional meetings, as needed, with CDOT project staff, stakeholders and specialty units. There will be a virtual meeting/conference call to be held once per month between CDOT, their specialty units and the design consultants. It is anticipated that up to 10 more virtual meetings/conference calls may be required as needed.

As directed and appropriate, the consultant will provide agendas and prepare exhibits, handouts, or other material for each meeting. The consultant will compile and distribute meeting minutes, and identify action items.

COMPILATION OF PS&E PACKAGE

ROADWAY DESIGN

In general, elements of roadway design are expected to include geometric design changes to accommodate any hydraulic and structural considerations. The bridges will be constructed using conventional methods. On-site and Off-Site detours may be required depending on location and need. Roadway design will be provided by the consultant.

Design criteria for the effected corridors will be developed based on the design speed and CDOT design criteria. It is anticipated that the horizontal alignments will generally be maintained, but vertical geometry may be modified as necessary to accommodate hydraulic and structural conditions. Typical section elements such as shoulder widths and turning will be evaluated and incorporated into the design. Guardrail design will be developed based on the associated clear zone requirements.

The roadway designer shall attend all project meetings, both internal and external, where the roadway geometry will be a discussion topic. For the purposes of this scope of work, five (5) meetings and the Initiation, FIR, and FOR meeting are assumed.

Specific elements of roadway design are expected to include:

- a. Mainline Alignments
 - a. Geometric design changes to approximately 1000 LF of mainline
 - b. Develop horizontal and vertical geometry changes for mainline
 - c. Develop Roadway and Channel Cross sections and Typical Sections for reconstruction
 - d. Generate Removal Plans for asphalt and Bridge demolition

- e. Compute earthwork, surfacing, and removal quantities
- f. Tabulate quantities
- b. On-Site Detour's (if required)
 - a. Geometric design changes to approximately 1000 LF
 - b. Develop horizontal and vertical geometry changes for detour's
 - c. Develop Roadway Cross sections and Typical Sections for detour's
 - d. Compute earthwork, surfacing, and removal quantities
 - e. Develop solutions for hydraulic events during detour operations
 - f. Tabulate quantities

A FIR Submittal will be prepared for the replacement of the bridges. The FIR package will not include specifications and tabulations. Quantities and an opinion of probable cost will be prepared at FIR. The FIR package will include the following plan sheets:

- Title Sheet (the consultant)
- Standard Plans List (the consultant)
- General Notes (the consultant)
- Typical Sections (the consultant)
- Removal Plans (the consultant)
- Roadway Plan and Profile Sheets (the consultant)
- Detour Plan and Profile Sheets (the consultant)
- Roadway Cross Sections (the consultant)
- Detour Cross Sections (the consultant)
- Bridge Plan Sheets (see Bridge Design section of this scope)
- Hydraulics Sheets (see Hydrology and Hydraulics section of this scope)
- Floodplain Info Sheet (preliminary)
- Utility Sheets
- Signing and Striping Sheets (see Traffic Design section of this scope) (the consultant)
- Standard Detail Sheets
- Preliminary Drainage and Hydraulic Design Reports (80% of Final)
- Digital media supporting calculation and design, including hydrologic and hydraulic models, CAD and GIS files, calculation spreadsheets and other software

A FOR Submittal will be prepared for the replacement of the bridges. The FOR package to include plans, specifications, and estimate of probable construction costs. The following plan sheets will be included:

- Title Sheet (the consultant)
- Standard Plans List (the consultant)
- General Notes (the consultant)
- Summary of Approximate Quantities (the consultant)
- Tabulation Summaries (the consultant)
- Typical Sections (the consultant)
- Removal Plans (the consultant)
- Roadway Plan and Profile Sheets (the consultant)
- Detour Plan and Profile Sheets (the consultant)
- Roadway Cross Sections (the consultant)

- Bridge Plan Sheets (see Bridge Design section of this scope)
- Hydraulics Sheets (see Hydrology and Hydraulics section of this scope)
- Floodplain Info Sheet (final)
- Storm Water Management Plan Sheets (see Environmental section of this scope)
- Wetland Impact Plan Sheets (if applicable)
- Utility Sheets
- Signing and Striping Sheets (see Traffic Design section of this scope) (the consultant)
- Construction Traffic Control Tabulation (see Traffic Design section of this scope) (the consultant)
- Standard Detail Sheets
- Final Drainage and Hydraulic Design Reports (100%)
- Digital media supporting calculation and design, including hydrologic and hydraulic models, CAD and GIS files, calculation spreadsheets and other software used for design

Roadway specifications will also be prepared and provided to the consultant for inclusion into the overall specification package.

Comments from the FIR and FOR review meetings will be incorporated into the plan set to produce a For-Advertisement (PS&E) package to be advertised by CDOT. The PS&E package shall include: plans, project special provisions, any applicable reports, and bid schedule.

Assumptions:

- Specifications:
 - CDOT Roadway Design Guide (2018)
 - CDOT CADD Manual (2011)
 - CDOT Standard Specifications for Road and Bridge Construction (2021). Project special provisions will be developed for any items not included in the CDOT Standard Specifications or Standard Special Provisions.
 - American Association of State Highway and Transportation Officials Roadside Design Guide
 - American Association of State Highway and Transportation Officials, A Policy on the Geometric Design of Highways and Streets
- All plan sheets and design to be completed in Microstation/OpenRoad Designer (ORD) and in accordance with the CDOT CADD Manual (2011).
- Summary of Approximate Quantities will be provided to CDOT at the FOR and Final Advertisement level for an estimate of approximate cost for construction.
- Design criteria for the corridors to be provided by CDOT (design speed, max super-elevation, ADT, DHV, % Trucks, etc.)
- Only one round of comments from the FOR meeting will be accepted and incorporated into For-Advertisement package. The consultant will provide a comment tracking sheet for the FOR meeting.
- Comments from any entity except CDOT shall not be considered during any phase of this project, unless authorized CDOT.

- Tabulation summaries to include: earthwork, surfacing, removals/resets/adjustments, delineators, traffic items (see Traffic Design section of this scope), survey, hydraulics/drainage/SWMP and bridge items.
- ROW Ownership map (if required) shall be prepared by CDOT.
- No utility relocation design is included in this scope.
- Any environmental clearances or permits required for the bridge replacement shall be completed by CDOT.
- Lighting design is not part of this project.
- Any floodplain permits required for work in FEMA-regulatory floodplains or floodways, acquired by CDOT. The consultant shall support these efforts with detail sheets, displays and quantity estimates as necessary to supplement the permit process.
- Soil sampling to inform SWMP development for topsoil analysis. All applicable lab testing associated with the topsoil analysis.

BRIDGE DESIGN AND DETAILING

Bridge design will be provided by CDOT Staff Bridge. The consultant will assist Staff Bridge by providing detailing of the bridge sheets based on the design criteria.

The bridge engineer shall attend all project meetings, both internal and external, where the bridges will be a discussion topic. For the purposes of this scope of work, ten (10) meetings are assumed. The primary detailer assigned to the project shall have a minimum of 3 years of bridge detailing experience.

Specific elements of the Bridge design details are expected to include:

- General Information (by CDOT Staff Bridge)
- Summary of Quantities (by CDOT Staff Bridge)
- General Layout (by CDOT Staff Bridge)
- Typical Section and Profile Grade (by CDOT Staff Bridge)
- Engineering Geology
- Bridge Hydraulic Information
- Construction Layout
- Foundation Layout Details
- Abutment Plan and Elevation sheets
- Wingwall Details
- Pier Plan and Elevation
- Pier Details
- Girder Details Prestressed Concrete Slab (by CDOT Staff Bridge)
- Deck reinforcing Plan
- Deck Reinforcing Details
- Bridge Rail Type 10M Details
- Approach Slab Details
- Excavation and Backfill
- Mechanically Stabilized Backfill
- Bridge Deck Elevations (by CDOT Staff Bridge)

The consultant will develop a full set of quantity calculations for the bridge plans in order to complete the quantity check for the bridge plans. It is anticipated that one round of comments will be incorporated into the quantity check calculations to resolve differences between the quantity and quantity check set.

GEOTECHNICAL ENGINEERING SERVICES AND PAVEMENT DESIGN

Geotechnical and pavement design services will be provided by CDOT. Scope of services may include:

- Locating borings in the field for bridge abutments and (as needed) center piers.
- Utility locate to clear site for drilling geotechnical explorations
- Drilling geotechnical explorations and collection of laboratory samples for testing and analysis for the bridge structure
- Drilling and sampling of pavement borings (if requested by the Region)
- Collection of bulk samples from stream bed for hydraulic analysis
- Production of boring logs and geology sheet displaying subsurface conditions and laboratory test results
- Geotechnical engineering analysis and design which will include foundation recommendations and geotechnical design parameters for foundation types appropriate for the structure or selected by the design team. Down-drag forces may need to be analyzed given the geology in the area and the potential for collapsible soils.
- Additional geotechnical analyses which may be required include:
Analysis of magnitude and time rate of settlement if grade raising or new fill walls are to be constructed. Global stability analysis of walls if new fill walls are to be constructed on shallow foundations. Bearing capacity and sliding resistance parameters to be provided if new fill walls are to be constructed.

HYDROLOGY AND HYDRAULIC ENGINEERING AND FLOODPLAIN MANAGEMENT

Hydrology and Hydraulics data will be collected, analyzed, and reported by CDOT Region 4 Hydraulics unit. This includes analysis and design of affected drainage locations.

Specific elements of Hydrology/Hydraulic Engineering are expected to include:

a) Hydrology/Hydraulic Supplements

- Plan Sheets
Hydraulic and drainage quantities, with the provided hydraulic structure sizing and any drainage pipe sizing performed by CDOT R4 hydraulics. This will include quantities, item numbers, and creation of drainage tabulation sheet for each structure. In addition, any project special provisions relating to hydraulics and drainage will be incorporated into the specification package.

Plan and profile sheets for any replacement or new drainage pipes including tabulations.

Coordination Efforts

- Pre-FIR coordination as well as post-FIR coordination between the roadway designers, bridge designers, and R4 Hydraulics to verify that the roadway design will not adversely impact the performance of the proposed structures nor adversely impact the ability to clear the floodplain.

The consultant will gather all the relevant information regarding the FEMA NFIP floodplains and floodways in the project area, to include available FIRM maps, FIS reports, GIS files, hydraulic model files and other available, useful information. The team will contact the jurisdictional floodplain administrator for the associated Counties to discuss the governing floodplain ordinances, and the process, submittal requirements, fees and timelines for Floodplain Development Permits.

Any supplemental geotechnical data, if not supplied by CDOT geotechnical staff, including streambed sediment gradation (2 per structure).

Assistance drafting grading plans necessary for structure replacements, roadside ditches, etc. These may be incorporated into other sheets, or be a standalone set of sheets for the proposed grading.

ENVIRONMENTAL ENGINEERING

CDOT will provide the environmental portion of this project. The CDOT Region Environmental Manager will complete technical analyses for resources listed on the front page of Form 128. The necessary documentation will be provided for each environmental resource. CDOT will also provide any special provisions regarding environmental issues.

The consultant landscape architect shall attend all project meetings, both internal and external, where the SWMP will be a discussion topic. For the purposes of this scope of work, three (3) meetings are assumed. The primary detailer assigned to the project shall have a minimum of 1 year of detailing experience.

Specific elements of the SWMP design details are expected to include:

- SWMP Plan Narrative Sheets
- SWMP Plan Detour Control Measures
- SWMP Plan Initial Site Maps
- SWMP Plan Interim Site Maps
- SWMP Plan Permanent Stabilization Site Maps
- Soil sampling to inform SWMP development (Topsoil analysis)
- Wetland Impact Notes Sheet
- Wetland Impact Plan Sheets

Environmental and SWMP details will be reviewed with Region 4 Environmental for concurrence.

TRAFFIC DESIGN

The signing and striping, traffic control, together with a peer review of the PS&E package will be completed by the consultant.

Traffic design services will include:

- Signing and striping
- Detour signing and striping
- Construction phasing
- Tabulations for construction and permanent items

Signing and Striping

Signing and pavement markings for the roadways and temporary detours will be completed by the consultant and Associates based on the 2009 MUTCD and latest CDOT S-Standards. The consultant will evaluate the existing signing and striping and make recommendations for improvements, if needed. Placement of delineators will also be considered and tabulated. Signing and striping modifications will be reviewed with Region 4 Traffic for concurrence.

Traffic Control

The consultant will evaluate construction phasing for the construction at each site. A schedule of traffic control devices and traffic control specifications will be prepared at final design for bidding purposes. Construction phasing plans and device plans are included in this scope of work. Work zone and construction staging needs, traffic volumes, and the Region 4 Lane Closure Strategy will be evaluated to develop an approach to construction phasing that can be used to develop traffic control quantities.

The consultant will design and prepare plan sheets for either an on-site or an off-site detour at each location if they are determined during design. All applicable design standards shall be met and a review with the Region 4 Traffic unit will be completed for concurrence.

Project Management and Coordination

The consultant will attend the following meetings in support of the consultant team:

- Formal Review Meetings – Initiation, FIR and FOR
- Design team meetings with the consultant (5 in person meetings, if possible)

Prepare FIR/FOR and PS&E Package

The following plan sheets are anticipated for traffic related items:

- Signing and Striping Plans - the consultant
- Signing and Striping Tabulations - the consultant
- Detour Signing and Striping – the consultant
- Traffic Control Tabulation - the consultant

- Quantities will be calculated and provided in spreadsheet format. Tabulations signing and striping (provided by the consultant) will be provided.
- Traffic specifications will be prepared at FOR and PS&E including Traffic Control Plan General.

SURVEYING

CDOT Region 4 Survey will provide all surveying needed for this project. The consultant may need to provide supplemental survey for either roadway elements or hydrology/hydraulic purposes.

UTILITIES – Subsurface Utility Engineering (SUE) Investigation

Services to Be Provided By the State of Colorado:

A. Subject to availability, the services to be provided or performed by the State of Colorado (State)

will include, but not be limited to, the following items:

- a. Schematic designs
- b. Provide existing data file, when available, to include but not limited to:
 - i. Existing topographic and physical feature data, graphic files, roadway design/geometry, survey control
 - ii. Roadway construction plans, documents for current and/or past projects;
 - iii. Right-of-Way mapping;
 - iv. Available interface data for any projects adjacent to, crossing, and/or within the immediate area of the defined project limits;
 - v. If available, Subsurface Utility Engineering (SUE) data and utility ownership/facility data from past projects within the project area;
 - vi. Planimetric layouts and/or related information; and
 - vii. Issuance of State Utility Permit
- c. Applicable general notes, special specifications, and special provisions.
- d. Approved State design standard drawings, standard summary and border sheets (i.e., blank summary tables, blank plans, and profile sheets with title blocks, etc.).
- e. In situations beyond the control of the SUE Consultant, provide assistance in obtaining required data/information from other local, regional, State and federal agencies.
- f. Provide timely review, comment or direction, as required, to aid the SUE Consultant in completing an assigned task or maintaining the established project schedule.
- g. Electronic Files: If not readily available online, the State may, at the discretion of the State's Project Manager or Region Utility Engineer, provide graphic file data, standards, font libraries, and Micro Station cell libraries, etc. as required to provide confirmation to the State's graphic standards.

Services to Be Provided By the Engineer:

B. A Professional Engineer licensed in the State of Colorado (Consultant) shall conduct, document, stamp and seal a Subsurface Utility Engineering (SUE) investigation of the project area to

determine existing utility conditions within the project limits. As part of the SUE investigation the Consultant will:

- a. contact all utility providers and collect available utility records within the project area;
 - b. Provide guidance as to what Utility Quality Level to attempt for any utilities that the Engineer believes do not need to be depicted at QLB
 - c. Attempt to identify all known and unknown utilities except as noted above within the project area at QLB, and depict those utilities at their actual achieved Utility Quality Level,
 - d. From a synthesis of all information, depict the following attributes on the plans or within the SUE report: ownership, type, size, encasement, material.
- C. Should utility relocation be required after designers make prudent attempts to avoid relocations, Engineer shall research, request, and furnish copies of utility easements (public and private) and utility franchise agreements to determine conditions under which the utility was established in its present location (e.g. by revocable permit or by a privately owned easement).
- D. The utility investigation requirements are to meet Quality Levels A and/or B, as required under CI/ASCE 38, and to the horizontal designation precision defined herein.
- E. The Consultant shall perform engineering services consisting of Subsurface Utility Engineering on the following project:

Project Number FBR 0061-092 Project Code 22529 – Timber Bridge Replacements of B-27-D, B-27-F and A-27-A (BE)

- a. The work will include a Subsurface Utility Engineering (SUE) Investigation to determine attributes and horizontal and vertical location of utilities:
 - i. The Consultant shall prepare a sealed PDF plan set, plus a working MicroStation (DGN) file(s) covering the specific work location, meeting the State’s standards and specifications.
 - ii. The Consultant shall complete a Quality Level B SUE investigation as directed by CDOT, as shown in the attached .dgn or .pdf files. *Note that the investigation area provided within the .dgn files is different than the area shown on Exhibit A Location Map. Use Exhibit A Location Map for SUE investigation area estimating.*
 - iii. The Consultant shall complete up to xxx (xx) Quality Level A Test Holes, at locations specified by CDOT after recommendations from Engineer and task designers following the examination of QL-B data on utility crossings, for verification of utilities in conflict with the proposed design.
 - iv. The Consultant shall complete overhead inventory within the area defined on the Location Map (Exhibit 1)
 - v. A sealed Subsurface Utility Engineering Report shall accompany the sealed plan set(s)
 - vi. A list of known utility providers is also attached.

Project Goals

For the purposes of this proposal, a utility is defined as: A privately, publicly, or cooperatively owned above or underground line, facility, or system for producing, transmitting, or distributing

communications, cable television, power, electricity, light, heat, gas, oil, crude products, water, storm water, irrigation, steam, waste, or any other similar commodity, including any fire or police signal system, street lighting system, or directional / instructional transportation related system or sign.

A. Quality Level B (QL-B) involves the use of Quality Level D and C methods of utility investigation

plus the use of surface geophysical techniques under the direction of a Professional Engineer licensed in the State of Colorado to determine the existence and horizontal position of underground utilities with a precision of *three inches* from the exterior sides of the line, facility, or system. This activity is called “designating.” The information obtained in this manner is surveyed to project control. Two-dimensional mapping information is obtained. This information is usually sufficient to accomplish preliminary engineering goals.

B. Quality Level A (QL-A) involves the use of Quality Level D, C and B methods of investigation plus

the use of minimally intrusive excavation methods at critical points to determine the precise horizontal and vertical position of underground utilities, as well as the type, size, condition, material, and other characteristics. The excavation and data documentation activity is called "test holing" (sometimes called Locating). It is the highest level of utility certainty presently available. When surveyed and mapped, precise plan and profile information is available for making final design decisions.

C. 3D Modeling involves the use of CADD to depict the precise horizontal and vertical profile of

each utility in areas of high conflict. This tool is only utilized in areas where precision locating and design of utilities is essential for project success.

Subsurface Utility Engineering Investigation Methodology

A. Project Scoping

- a. This work is included in the Project Scoping Plan Set for the Project Scoping meeting
- b. Quality Level B SUE Investigation, as defined above
- c. Use existing survey project control data, GIS data, plans and electronic data from utility providers, and field survey to prepare utility design plans that meet ASCE 38 Quality Level B standards.

B. FIR (Field Inspection Review)

- a. This work is performed at 30% design, prior to FOR Plan development
- b. First iteration of Quality Level A SUE Investigation

C. FOR (Final Office Review)

- a. Second iteration of Quality Level A SUE Investigation
- b. 3D Modeling – when required, this work is performed at 60% design, during FOR Plan development. 3D modeling may require additional utility investigations including MCGPR and non-excavation depth determinations.

D. PS&E (Plans, Specifications & Estimate)

- a. Ready for Utility Clearance
- b. Ready for Advertisement

Deliverables

A. Project Scoping:

- a. The end product (the CADD file or project plans and SUE Report) contains the results of

- the SUE investigation for utilities, ownership, type, and size of the line including any special conditions of the line.
- b. The CADD file or project plans should depict the lines following CDOT utility line type standards and colors, include all utility easements, and CDOT power source locations and the status of any easements.
 - c. Easements shown on plans
 - d. Through outreach to the utility providers, the consultant will produce a utility contact list: Including utility provider, contact name, email address, mailing address, work & cell phone numbers. These are to be shown in the utility general notes and specifications.
 - e. The utility plans sheets will include the utility line work with proper designation colors.
 - f. The consultant will include services for water, sewer, electrical, communications and natural gas.
 - g. The consultant will differentiate transmission main lines and secondary feed lines with labels when possible.
 - h. The consultant will distinguish lines between CDOT owned facilities, local agency facilities and utility provider facilities.
 - i. The consultant will produce utility plan sheets for review with utility providers including an oversize plan sheet for coordination and meetings.
 - j. The consultant will include known easements for the utility providers located inside, and adjacent to, CDOT ROW on the utility plans.
 - k. The consultant to provide a table for each utility provider that includes size and type of the providers' facilities.
 - l. Include manhole rim labels and inverts in and out labels that match CDOT project datum elevations.
- B. FIR (Field Inspection Review)**
- a. The consultant will provide a matrix of potential utility conflicts
 - b. The consultant will provide test hole services
 - c. The consultant will provide a test hole map for survey.
 - d. The consultant will provide a test hole chart and incorporate test hole location into the FIR Utility Plans
 - e. The consultant will update utility plan sheets for review with utility providers including an oversize plan sheet for coordination and meetings
 - f. The consultant will update the utility plans through coordination with utility providers to verify storm and sanitary sewer rim elevations, inverts in and inverts out, include pipe size and pipe material. Include labels for other sewer appurtenances, lift stations, drop manholes, vents and force mains, elevations for water valve boxes including size, water line pipe size and water line pipe material. Include labels for other water appurtenances, air vacuums, PRV vaults, vents and curb stops. Verify dry utility lines and show labels for vaults, pull boxes, manholes, drop down transformers and other providers attached to all overhead utility line poles.
- C. FOR (Final Office Review)**
- a. Produce Utility notification letters for Region Utility Engineer.
 - b. The consultant will calculate quantities and produce a tabulation of utility pay items.
 - c. The consultant will incorporate on the utility plan sheets all relocation work.
 - d. The consultant will provide Utility 3-D modeling in high conflict areas where precision placement of utilities during the design phase is essential.

- e. The utility plans sheets will include the utility line work with proper designation colors.
- f. The consultant will include utility notes and specifications.
- g. The consultant will complete FOR design for utility plans.
- h. The consultant will finalize the identification of existing utilities (both wet and dry) that will be impacted by design and finalize the existing utility plans with call-outs indicating which existing utilities are impacted by the project.
- i. The consultant will work with utility providers to get estimates for utility work.
- j. Cross section sections will include utility crossings and ROW lines.
- k. The Consultant will provide MicroStation compatible electronic files of utilities for inclusion in other plan sheets.

Utility Coordination

A. Scoping

- a. The Consultant will be responsible for obtaining all permits for work within CDOT ROW related to SUE investigations.
- b. Coordination of scoping meetings with all utility providers and meeting minutes.
- c. Request and receipt of utility maps and easements from utility companies will be coordinated with CDOT project manager and with CDOT region utility engineer.
- d. The consultant will conduct a review of utility information, obtain existing utility mapping from the utility providers.
- e. Request franchise agreements from the local agencies.
- f. Request any secondary utility provider attachments to the main utility provider's facility.
- g. Consultant to work with surveyor to adjust datum to match CDOT project

B. FIR (Field Inspection Review)

- a. Coordination of FIR meetings with all utility providers and meeting minutes. (Office and Field)
- b. Review utility matrix conflicts with CDOT RUE and work on plan of action.
- c. Review test hole map with CDOT.
- d. The consultant will coordinate with CDOT, test hole company and survey company on test hole schedule.
- e. The consultant will coordinate with the CDOT region utility engineer on utility notes and specifications.
- f. The Consultant will be responsible for obtaining all permits for work within CDOT ROW related to SUE investigations.
- g. The consultant will coordinate with project manager and CDOT RUE and affected utility companies on the FIR utility plans for distribution.

C. FOR (Final Office Review)

- a. Coordination of FOR meetings with all utility providers and meeting minutes. (Office and Field)
- b. Coordination with the wet and dry utility providers on the potential relocation areas
- c. The consultant will coordinate with project manager and CDOT region utility engineer and affected utility companies on the FOR design.

RIGHT-OF-WAY

The consultant will acquire the appropriate CDOT Special Use Permit (CDOT 1233) to survey within the CDOT's Rights-of-Way. If ROW is needed for any of these sites, CDOT will determine if additional services are necessary and a new task order will be developed.

TMOSS SURVEY (GROUND)

CDOT Region 4 Survey staff will be responsible for obtaining this information.

BRIDGE/STRUCTURE SURVEY(GROUND)

CDOT Region 4 Survey staff will obtain, by field methods, detailed survey of the above referenced three structures. The survey will include the length of bridge, upstream and downstream location of piers and abutments (front face of abutments), piers (including notes for distances from center to center of piers, dimensions, shape, and type), low chord, profile of handrail/guardrail, profile of road centerline, and bridge deck.

PEER REVIEW AND QA/QC

The consultant will provide one QA/QC review of the consultant documents at each plan submission, FIR, FOR and PS&E. The consultant will also provide technical support throughout the project in an advisory capacity. In addition, the consultant will provide peer review of the overall construction documents in support of the consultant. The consultant's review efforts will confirm appropriateness of methodologies used, accuracy of documents, reasonableness of conclusions, document completeness, and overall clarity.

BASIS OF DESIGN

AASHTO methodologies, CDOT standards, the 2009 MUTCD, PROWAG, CDOT Access Code, FHWA HEC-series and HDS-series manuals, and AASHTO's Roadside Design Guide will serve as the basis of design.

ITEMS SPECIFICALLY NOT INCLUDED

The following items are not included in this scope of work. They are either anticipated to be provided by others or not needed for the project at this time.

- Lighting design
- Public Outreach Support and Participation
- Construction management
- Post Design Services
- ROW plans and acquisition
- Environmental clearances and permits

PROJECT MANAGEMENT AND ADMINISTRATION

The consultant will submit monthly invoices, in CDOT’s format. Invoices will include a summary of work performed for the period, and progress status. The consultant will also perform other paperwork and reporting, required by CDOT or otherwise necessary, to administer and manage the task order.

SCHEDULE AND BUDGET

The consultant will perform the work for a not-to-exceed amount of \$ XXX,XXX. The completion date for all services under this task order is 04/30/2024.

**TASK ORDER SCOPE OF WORK
EASTERN PLAINS TIMBER BRIDGE REPLACEMENT
ENGINEERING SUPPORT SERVICES**

CONTRACT TYPE
 Specific Rate of Pay
 Cost Plus Fixed Fee
 Other

CONTRACT DATE: October 14, 2021

PROJECT NUMBER: BR 0061-093

PROJECT LOCATION: US 6 Timber Bridge Replacement

PROJECT CODE: 24243

Background and Purpose

Region 4 (Sterling Residency) requires design services for the replacement of one (1) timber structure in Phillips county, Colorado. Based on discussions with Region 4 staff, CDOT is requesting engineering design services to compile the complete set of plans including the storm water management sheets, specifications, and estimate costs that are required for advertisement by CDOT. The project delivery method will be Design Bid Build. The table below indicates the structure, location, and services required:

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B-27-A	US 6J	Holyoke	454.578	x	x	x	x	x	x

SCOPE OF SERVICES

Meetings

1. Task Order Meetings

- CDOT and the consultant project managers (PMs) will meet biweekly to at least monthly; to assess and monitor overall task order progress and budget, and make any needed decisions. Progress meetings can be held in-person or via teleconference.

2. Project Meetings

- A project Design Initiation meeting will be scheduled and conducted with appropriate stakeholders and specialty units. It is anticipated that the design initiation meeting will be held soon after the notice to proceed has been issued.
- An FIR meeting will be conducted in September of 2022 with appropriate stakeholders and specialty units.
- An FOR meeting will be conducted in June 2023, with appropriate stakeholders and specialty units.
- Up to four (4) additional meetings, as needed, with CDOT project staff, stakeholders and specialty units. There will be a virtual meeting/conference call to be held once per month between CDOT, their specialty units and the design consultants. It is anticipated that up to 10 more virtual meetings/conference calls may be required as needed.

As directed and appropriate, the consultant will provide agendas and prepare exhibits, handouts, or other material for each meeting. The consultant will compile and distribute meeting minutes, and identify action items.

COMPILATION OF PS&E PACKAGE

ROADWAY DESIGN

In general, elements of roadway design are expected to include geometric design changes to accommodate any hydraulic and structural considerations. The bridges will be constructed using conventional methods. An On-site or Off-Site detour may be required depending need. Roadway design will be provided by the consultant.

Design criteria for the effected corridors will be developed based on the design speed and CDOT design criteria. It is anticipated that the horizontal alignments will generally be maintained, but vertical geometry may be modified as necessary to accommodate hydraulic and structural conditions. Typical section elements such as shoulder widths and turning will be evaluated and incorporated into the design. Guardrail design will be developed based on the associated clear zone requirements.

The roadway designer shall attend all project meetings, both internal and external, where the roadway geometry will be a discussion topic. For the purposes of this scope of work, five (5) meetings and the Initiation, FIR, and FOR meeting are assumed.

Specific elements of roadway design are expected to include:

- a. Mainline Alignments
 - a. Geometric design changes to approximately 1000 LF of mainline
 - b. Develop horizontal and vertical geometry changes for mainline
 - c. Develop Roadway and Channel Cross sections and Typical Sections for reconstruction
 - d. Generate Removal Plans for asphalt and Bridge demolition
 - e. Compute earthwork, surfacing, and removal quantities

- f. Tabulate quantities
- b. On-Site Detour's (if required)
 - a. Geometric design changes to approximately 1000 LF
 - b. Develop horizontal and vertical geometry changes for the detour
 - c. Develop Roadway Cross sections and Typical Sections for the detour
 - d. Compute earthwork, surfacing, and removal quantities
 - e. Develop solutions for hydraulic events during detour operations
 - f. Tabulate quantities

A FIR Submittal will be prepared for the replacement of the bridges. The FIR package will not include specifications and tabulations. Quantities and an opinion of probable cost will be prepared at FIR. The FIR package will include the following plan sheets:

- Title Sheet (the consultant)
- Standard Plans List (the consultant)
- General Notes (the consultant)
- Typical Sections (the consultant)
- Removal Plans (the consultant)
- Roadway Plan and Profile Sheets (the consultant)
- Detour Plan and Profile Sheets (the consultant)
- Roadway Cross Sections (the consultant)
- Detour Cross Sections (the consultant)
- Bridge Plan Sheets (see Bridge Design section of this scope)
- Hydraulics Sheets (see Hydrology and Hydraulics section of this scope)
- Floodplain Info Sheet (preliminary)
- Utility Sheets
- Signing and Striping Sheets (see Traffic Design section of this scope) (the consultant)
- Standard Detail Sheets
- Preliminary Drainage and Hydraulic Design Reports (80% of Final)
- Digital media supporting calculation and design, including hydrologic and hydraulic models, CAD and GIS files, calculation spreadsheets and other software

A FOR Submittal will be prepared for the replacement of the bridges. The FOR package to include plans, specifications, and estimate of probable construction costs. The following plan sheets will be included:

- Title Sheet (the consultant)
- Standard Plans List (the consultant)
- General Notes (the consultant)
- Summary of Approximate Quantities (the consultant)
- Tabulation Summaries (the consultant)
- Typical Sections (the consultant)
- Removal Plans (the consultant)
- Roadway Plan and Profile Sheets (the consultant)
- Detour Plan and Profile Sheets (the consultant)
- Roadway Cross Sections (the consultant)
- Bridge Plan Sheets (see Bridge Design section of this scope)

- Hydraulics Sheets (see Hydrology and Hydraulics section of this scope)
- Floodplain Info Sheet (final)
- Utility Sheets
- Signing and Striping Sheets (see Traffic Design section of this scope) (the consultant)
- Construction Traffic Control Tabulation (see Traffic Design section of this scope) (the consultant)
- Standard Detail Sheets
- Final Drainage and Hydraulic Design Reports (100%)
- Digital media supporting calculation and design, including hydrologic and hydraulic models, CAD and GIS files, calculation spreadsheets and other software used for design

Roadway specifications will also be prepared and provided to the consultant for inclusion into the overall specification package.

Comments from the FIR and FOR review meetings will be incorporated into the plan set to produce a For-Advertisement (PS&E) package to be advertised by CDOT. The PS&E package shall include: plans, project special provisions, any applicable reports, and bid schedule.

Assumptions:

- Specifications:
 - CDOT Roadway Design Guide (2018)
 - CDOT CADD Manual (2011)
 - CDOT Standard Specifications for Road and Bridge Construction (2021). Project special provisions will be developed for any items not included in the CDOT Standard Specifications or Standard Special Provisions.
 - American Association of State Highway and Transportation Officials Roadside Design Guide
 - American Association of State Highway and Transportation Officials, A Policy on the Geometric Design of Highways and Streets
- All plan sheets and design to be completed in Microstation/OpenRoad Designer (ORD) and in accordance with the CDOT CADD Manual (2011).
- Summary of Approximate Quantities will be provided to CDOT at the FOR and Final Advertisement level for an estimate of approximate cost for construction.
- Design criteria for the corridors to be provided by CDOT (design speed, max super-elevation, ADT, DHV, % Trucks, etc.)
- Only one round of comments from the FOR meeting will be accepted and incorporated into For-Advertisement package. The consultant will provide a comment tracking sheet for the FOR meeting.
- Comments from any entity except CDOT shall not be considered during any phase of this project, unless authorized CDOT.
- Tabulation summaries to include: earthwork, surfacing, removals/resets/adjustments, delineators, traffic items (see Traffic Design section of this scope), survey, hydraulics/drainage/SWMP and bridge items.
- ROW Ownership map (if required) shall be prepared by CDOT.

- No utility relocation design is included in this scope.
- Any environmental clearances or permits required for the bridge replacement shall be completed by CDOT.
- Lighting design is not part of this project.
- Any floodplain permits required for work in FEMA-regulatory floodplains or floodways, acquired by CDOT. The consultant shall support these efforts with detail sheets, displays and quantity estimates as necessary to supplement the permit process.
- Soil sampling to inform SWMP development for topsoil analysis. All applicable lab testing associated with the topsoil analysis.

BRIDGE DESIGN AND DETAILING

Bridge design will be provided by CDOT Staff Bridge. The consultant will assist Staff Bridge by providing detailing of the bridge sheets based on the design criteria.

The bridge engineer shall attend all project meetings, both internal and external, where the bridges will be a discussion topic. For the purposes of this scope of work, ten (10) meetings are assumed. The primary detailer assigned to the project shall have a minimum of 3 years of bridge detailing experience.

Specific elements of the Bridge design details are expected to include:

- General Information (by CDOT Staff Bridge)
- Summary of Quantities (by CDOT Staff Bridge)
- General Layout (by CDOT Staff Bridge)
- Typical Section and Profile Grade (by CDOT Staff Bridge)
- Engineering Geology
- Bridge Hydraulic Information
- Construction Layout
- Foundation Layout Details
- Abutment Plan and Elevation sheets
- Wingwall Details
- Pier Plan and Elevation
- Pier Details
- Girder Details Prestressed Concrete Slab (by CDOT Staff Bridge)
- Deck reinforcing Plan
- Deck Reinforcing Details
- Bridge Rail Type 10M Details
- Approach Slab Details
- Excavation and Backfill
- Mechanically Stabilized Backfill
- Bridge Deck Elevations (by CDOT Staff Bridge)

The consultant will develop a full set of quantity calculations for the bridge plans in order to complete the quantity check for the bridge plans. It is anticipated that one round of comments will be incorporated into the quantity check calculations to resolve differences between the quantity and quantity check set.

GEOTECHNICAL ENGINEERING SERVICES AND PAVEMENT DESIGN

Geotechnical and pavement design services will be provided by CDOT. Scope of services may include:

- Locating borings in the field for bridge abutments and (as needed) center piers.
- Utility locate to clear site for drilling geotechnical explorations
- Drilling geotechnical explorations and collection of laboratory samples for testing and analysis for the bridge structure
- Drilling and sampling of pavement borings (if requested by the Region)
- Collection of bulk samples from stream bed for hydraulic analysis
- Production of boring logs and geology sheet displaying subsurface conditions and laboratory test results
- Geotechnical engineering analysis and design which will include foundation recommendations and geotechnical design parameters for foundation types appropriate for the structure or selected by the design team. Down-drag forces may need to be analyzed given the geology in the area and the potential for collapsible soils.
- Additional geotechnical analyses which may be required include:
Analysis of magnitude and time rate of settlement if grade raising or new fill walls are to be constructed. Global stability analysis of walls if new fill walls are to be constructed on shallow foundations. Bearing capacity and sliding resistance parameters to be provided if new fill walls are to be constructed.

HYDROLOGY AND HYDRAULIC ENGINEERING AND FLOODPLAIN MANAGEMENT

Hydrology and Hydraulics data will be collected, analyzed, and reported by CDOT Region 4 Hydraulics unit. This includes analysis and design of affected drainage locations.

Specific elements of Hydrology/Hydraulic Engineering are expected to include:

a) Hydrology/Hydraulic Supplements

- Plan Sheets

Hydraulic and drainage quantities, with the provided hydraulic structure sizing and any drainage pipe sizing performed by CDOT R4 hydraulics. This will include quantities, item numbers, and creation of drainage tabulation sheet for each structure. In addition, any project special provisions relating to hydraulics and drainage will be incorporated into the specification package.

Plan and profile sheets for any replacement or new drainage pipes including tabulations.

Coordination Efforts

- Pre-FIR coordination as well as post-FIR coordination between the roadway designers, bridge designers, and R4 Hydraulics to verify that the roadway design will

not adversely impact the performance of the proposed structures nor adversely impact the ability to clear the floodplain.

The consultant will gather all the relevant information regarding the FEMA NFIP floodplains and floodways in the project area, to include available FIRM maps, FIS reports, GIS files, hydraulic model files and other available, useful information. The team will contact the jurisdictional floodplain administrator for the associated Counties to discuss the governing floodplain ordinances, and the process, submittal requirements, fees and timelines for Floodplain Development Permits.

Any supplemental geotechnical data, if not supplied by CDOT geotechnical staff, including streambed sediment gradation (2 per structure).

Assistance drafting grading plans necessary for structure replacements, roadside ditches, etc. These may be incorporated into other sheets, or be a standalone set of sheets for the proposed grading.

ENVIRONMENTAL ENGINEERING

CDOT will provide the environmental portion of this project. The CDOT Region Environmental Manager will complete technical analyses for resources listed on the front page of Form 128. The necessary documentation will be provided for each environmental resource. CDOT will also provide any special provisions regarding environmental issues.

The consultant landscape architect shall attend all project meetings, both internal and external, where the SWMP will be a discussion topic. For the purposes of this scope of work, three (3) meetings are assumed. The primary detailer assigned to the project shall have a minimum of 1 year of detailing experience.

Specific elements of the SWMP design details are expected to include:

- SWMP Plan Narrative Sheets
- SWMP Plan Detour Control Measures
- SWMP Plan Initial Site Maps
- SWMP Plan Interim Site Maps
- SWMP Plan Permanent Stabilization Site Maps
- Soil sampling to inform SWMP development (Topsoil analysis)
- Wetland Impact Notes Sheet
- Wetland Impact Plan Sheets

Environmental and SWMP details will be reviewed with Region 4 Environmental for concurrence.

TRAFFIC DESIGN

The signing and striping, traffic control, together with a peer review of the PS&E package will be completed by the consultant.

Traffic design services will include:

- Signing and striping

- Detour signing and striping
- Construction phasing
- Tabulations for construction and permanent items

Signing and Striping

Signing and pavement markings for the roadways and temporary detours will be completed by the consultant and Associates based on the 2009 MUTCD and latest CDOT S-Standards. The consultant will evaluate the existing signing and striping and make recommendations for improvements, if needed. Placement of delineators will also be considered and tabulated. Signing and striping modifications will be reviewed with Region 4 Traffic for concurrence.

Traffic Control

The consultant will evaluate construction phasing for the construction at each site. A schedule of traffic control devices and traffic control specifications will be prepared at final design for bidding purposes. Construction phasing plans and device plans are included in this scope of work. Work zone and construction staging needs, traffic volumes, and the Region 4 Lane Closure Strategy will be evaluated to develop an approach to construction phasing that can be used to develop traffic control quantities.

The consultant will design and prepare plan sheets for either an on-site or an off-site detour at each location if they are determined during design. All applicable design standards shall be met and a review with the Region 4 Traffic unit will be completed for concurrence.

Project Management and Coordination

The consultant will attend the following meetings in support of the consultant team:

- Formal Review Meetings – Initiation, FIR and FOR
- Design team meetings with the consultant (5 in person meetings, if possible)

Prepare FIR/FOR and PS&E Package

The following plan sheets are anticipated for traffic related items:

- Signing and Striping Plans - the consultant
- Signing and Striping Tabulations - the consultant
- Detour Signing and Striping – the consultant
- Traffic Control Tabulation - the consultant
- Quantities will be calculated and provided in spreadsheet format. Tabulations signing and striping (provided by the consultant) will be provided.
- Traffic specifications will be prepared at FOR and PS&E including Traffic Control Plan General.

SURVEYING

CDOT Region 4 Survey will provide all surveying needed for this project. The consultant may need to provide supplemental survey for either roadway elements or hydrology/hydraulic purposes.

UTILITIES – Subsurface Utility Engineering (SUE) Investigation

Services to Be Provided By the State of Colorado:

A. Subject to availability, the services to be provided or performed by the State of Colorado (State)

will include, but not be limited to, the following items:

- a. Schematic designs
- b. Provide existing data file, when available, to include but not limited to:
 - i. Existing topographic and physical feature data, graphic files, roadway design/geometry, survey control
 - ii. Roadway construction plans, documents for current and/or past projects;
 - iii. Right-of-Way mapping;
 - iv. Available interface data for any projects adjacent to, crossing, and/or within the immediate area of the defined project limits;
 - v. If available, Subsurface Utility Engineering (SUE) data and utility ownership/facility data from past projects within the project area;
 - vi. Planimetric layouts and/or related information; and
 - vii. Issuance of State Utility Permit
- c. Applicable general notes, special specifications, and special provisions.
- d. Approved State design standard drawings, standard summary and border sheets (i.e., blank summary tables, blank plans, and profile sheets with title blocks, etc.).
- e. In situations beyond the control of the SUE Consultant, provide assistance in obtaining required data/information from other local, regional, State and federal agencies.
- f. Provide timely review, comment or direction, as required, to aid the SUE Consultant in completing an assigned task or maintaining the established project schedule.
- g. Electronic Files: If not readily available online, the State may, at the discretion of the State's Project Manager or Region Utility Engineer, provide graphic file data, standards, font libraries, and Micro Station cell libraries, etc. as required to provide confirmation to the State's graphic standards.

Services to Be Provided By the Engineer:

B. A Professional Engineer licensed in the State of Colorado (Consultant) shall conduct, document, stamp and seal a Subsurface Utility Engineering (SUE) investigation of the project area to determine existing utility conditions within the project limits. As part of the SUE investigation the Consultant will:

- a. contact all utility providers and collect available utility records within the project area;
- b. Provide guidance as to what Utility Quality Level to attempt for any utilities that the Engineer believes do not need to be depicted at QLB

- c. Attempt to identify all known and unknown utilities except as noted above within the project area at QLB, and depict those utilities at their actual achieved Utility Quality Level,
- d. From a synthesis of all information, depict the following attributes on the plans or within the SUE report: ownership, type, size, encasement, material.
- C. Should utility relocation be required after designers make prudent attempts to avoid relocations, Engineer shall research, request, and furnish copies of utility easements (public and private) and utility franchise agreements to determine conditions under which the utility was established in its present location (e.g. by revocable permit or by a privately owned easement).
- D. The utility investigation requirements are to meet Quality Levels A and/or B, as required under CI/ASCE 38, and to the horizontal designation precision defined herein.
- E. The Consultant shall perform engineering services consisting of Subsurface Utility Engineering on the following project:

Project Number BR 0061-093 Project Code 24243 – Timber Bridge Replacement of B-27-A (Non-BE)

- a. The work will include a Subsurface Utility Engineering (SUE) Investigation to determine attributes and horizontal and vertical location of utilities:
 - i. The Consultant shall prepare a sealed PDF plan set, plus a working MicroStation (DGN) file(s) covering the specific work location, meeting the State’s standards and specifications.
 - ii. The Consultant shall complete a Quality Level B SUE investigation as directed by CDOT, as shown in the attached .dgn or .pdf files. *Note that the investigation area provided within the .dgn files is different than the area shown on Exhibit A Location Map. Use Exhibit A Location Map for SUE investigation area estimating.*
 - iii. The Consultant shall complete up to xxx (xx) Quality Level A Test Holes, at locations specified by CDOT after recommendations from Engineer and task designers following the examination of QL-B data on utility crossings, for verification of utilities in conflict with the proposed design.
 - iv. The Consultant shall complete overhead inventory within the area defined on the Location Map (Exhibit 1)
 - v. A sealed Subsurface Utility Engineering Report shall accompany the sealed plan set(s)
 - vi. A list of known utility providers is also attached.

Project Goals

For the purposes of this proposal, a utility is defined as: A privately, publicly, or cooperatively owned above or underground line, facility, or system for producing, transmitting, or distributing communications, cable television, power, electricity, light, heat, gas, oil, crude products, water, storm water, irrigation, steam, waste, or any other similar commodity, including any fire or police signal system, street lighting system, or directional / instructional transportation related system or sign.

- A. **Quality Level B (QL-B)** involves the use of Quality Level D and C methods of utility investigation plus the use of surface geophysical techniques under the direction of a Professional Engineer licensed in the State of Colorado to determine the existence and horizontal position of underground utilities with a precision of *three inches* from the exterior sides of the line, facility, or system. This activity is called “designating.” The information obtained in this manner is surveyed to project control. Two-dimensional mapping information is obtained. This information is usually sufficient to accomplish preliminary engineering goals.
- B. **Quality Level A (QL-A)** involves the use of Quality Level D, C and B methods of investigation plus the use of minimally intrusive excavation methods at critical points to determine the precise horizontal and vertical position of underground utilities, as well as the type, size, condition, material, and other characteristics. The excavation and data documentation activity is called "test holing" (sometimes called Locating). It is the highest level of utility certainty presently available. When surveyed and mapped, precise plan and profile information is available for making final design decisions.
- C. **3D Modeling** involves the use of CADD to depict the precise horizontal and vertical profile of each utility in areas of high conflict. This tool is only utilized in areas where precision locating and design of utilities is essential for project success.

Subsurface Utility Engineering Investigation Methodology

- A. Project Scoping
- a. This work is included in the Project Scoping Plan Set for the Project Scoping meeting
 - b. Quality Level B SUE Investigation, as defined above
 - c. Use existing survey project control data, GIS data, plans and electronic data from utility providers, and field survey to prepare utility design plans that meet ASCE 38 Quality Level B standards.
- B. FIR (Field Inspection Review)
- a. This work is performed at 30% design, prior to FOR Plan development
 - b. First iteration of Quality Level A SUE Investigation
- C. FOR (Final Office Review)
- a. Second iteration of Quality Level A SUE Investigation
 - b. 3D Modeling – when required, this work is performed at 60% design, during FOR Plan development. 3D modeling may require additional utility investigations including MCGPR and non-excavation depth determinations.
- D. PS&E (Plans, Specifications & Estimate)
- a. Ready for Utility Clearance
 - b. Ready for Advertisement

Deliverables

- A. Project Scoping:
- a. The end product (the CADD file or project plans and SUE Report) contains the results of the SUE investigation for utilities, ownership, type, and size of the line including any special conditions of the line.
 - b. The CADD file or project plans should depict the lines following CDOT utility line type standards and colors, include all utility easements, and CDOT power source locations

and the status of any easements.

c. Easements shown on plans

d. Through outreach to the utility providers, the consultant will produce a utility contact list: Including utility provider, contact name, email address, mailing address, work & cell phone numbers. These are to be shown in the utility general notes and specifications.

e. The utility plans sheets will include the utility line work with proper designation colors.

f. The consultant will include services for water, sewer, electrical, communications and natural gas.

g. The consultant will differentiate transmission main lines and secondary feed lines with labels when possible.

h. The consultant will distinguish lines between CDOT owned facilities, local agency facilities and utility provider facilities.

i. The consultant will produce utility plan sheets for review with utility providers including an oversize plan sheet for coordination and meetings.

j. The consultant will include known easements for the utility providers located inside, and adjacent to, CDOT ROW on the utility plans.

k. The consultant to provide a table for each utility provider that includes size and type of the providers' facilities.

l. Include manhole rim labels and inverts in and out labels that match CDOT project datum elevations.

B. FIR (Field Inspection Review)

a. The consultant will provide a matrix of potential utility conflicts

b. The consultant will provide test hole services

c. The consultant will provide a test hole map for survey.

d. The consultant will provide a test hole chart and incorporate test hole location into the FIR Utility Plans

e. The consultant will update utility plan sheets for review with utility providers including an oversize plan sheet for coordination and meetings

f. The consultant will update the utility plans through coordination with utility providers to verify storm and sanitary sewer rim elevations, inverts in and inverts out, include pipe size and pipe material. Include labels for other sewer appurtenances, lift stations, drop manholes, vents and force mains, elevations for water valve boxes including size, water line pipe size and water line pipe material. Include labels for other water appurtenances, air vacuums, PRV vaults, vents and curb stops. Verify dry utility lines and show labels for vaults, pull boxes, manholes, drop down transformers and other providers attached to all overhead utility line poles.

C. FOR (Final Office Review)

a. Produce Utility notification letters for Region Utility Engineer.

b. The consultant will calculate quantities and produce a tabulation of utility pay items.

c. The consultant will incorporate on the utility plan sheets all relocation work.

d. The consultant will provide Utility 3-D modeling in high conflict areas where precision placement of utilities during the design phase is essential.

e. The utility plans sheets will include the utility line work with proper designation colors.

f. The consultant will include utility notes and specifications.

g. The consultant will complete FOR design for utility plans.

h. The consultant will finalize the identification of existing utilities (both wet and dry) that

will be impacted by design and finalize the existing utility plans with call-outs indicating which existing utilities are impacted by the project.

- i. The consultant will work with utility providers to get estimates for utility work.
- j. Cross section sections will include utility crossings and ROW lines.
- k. The Consultant will provide MicroStation compatible electronic files of utilities for inclusion in other plan sheets.

Utility Coordination

A. Scoping

- a. The Consultant will be responsible for obtaining all permits for work within CDOT ROW related to SUE investigations.
- b. Coordination of scoping meetings with all utility providers and meeting minutes.
- c. Request and receipt of utility maps and easements from utility companies will be coordinated with CDOT project manager and with CDOT region utility engineer.
- d. The consultant will conduct a review of utility information, obtain existing utility mapping from the utility providers.
- e. Request franchise agreements from the local agencies.
- f. Request any secondary utility provider attachments to the main utility provider's facility.
- g. Consultant to work with surveyor to adjust datum to match CDOT project

B. FIR (Field Inspection Review)

- a. Coordination of FIR meetings with all utility providers and meeting minutes. (Office and Field)
- b. Review utility matrix conflicts with CDOT RUE and work on plan of action.
- c. Review test hole map with CDOT.
- d. The consultant will coordinate with CDOT, test hole company and survey company on test hole schedule.
- e. The consultant will coordinate with the CDOT region utility engineer on utility notes and specifications.
- f. The Consultant will be responsible for obtaining all permits for work within CDOT ROW related to SUE investigations.
- g. The consultant will coordinate with project manager and CDOT RUE and affected utility companies on the FIR utility plans for distribution.

C. FOR (Final Office Review)

- a. Coordination of FOR meetings with all utility providers and meeting minutes. (Office and Field)
- b. Coordination with the wet and dry utility providers on the potential relocation areas
- c. The consultant will coordinate with project manager and CDOT region utility engineer and affected utility companies on the FOR design.

RIGHT-OF-WAY

The consultant will acquire the appropriate CDOT Special Use Permit (CDOT 1233) to survey within the CDOT's Rights-of-Way. If ROW is needed for any of these sites, CDOT will determine if additional services are necessary and a new task order will be developed.

TMOSS SURVEY (GROUND)

CDOT Region 4 Survey staff will be responsible for obtaining this information.

BRIDGE/STRUCTURE SURVEY(GROUND)

CDOT Region 4 Survey staff will obtain, by field methods, detailed survey of the above referenced structure. The survey will include the length of bridge, upstream and downstream location of piers and abutments (front face of abutments), piers (including notes for distances from center to center of piers, dimensions, shape, and type), low chord, profile of handrail/guardrail, profile of road centerline, and bridge deck.

PEER REVIEW AND QA/QC

The consultant will provide one QA/QC review of the consultant documents at each plan submission, FIR, FOR and PS&E. The consultant will also provide technical support throughout the project in an advisory capacity. In addition, the consultant will provide peer review of the overall construction documents in support of the consultant. The consultant's review efforts will confirm appropriateness of methodologies used, accuracy of documents, reasonableness of conclusions, document completeness, and overall clarity.

BASIS OF DESIGN

AASHTO methodologies, CDOT standards, the 2009 MUTCD, PROWAG, CDOT Access Code, FHWA HEC-series and HDS-series manuals, and AASHTO's Roadside Design Guide will serve as the basis of design.

ITEMS SPECIFICALLY NOT INCLUDED

The following items are not included in this scope of work. They are either anticipated to be provided by others or not needed for the project at this time.

- Lighting design
- Public Outreach Support and Participation
- Construction management
- Post Design Services
- ROW plans and acquisition
- Environmental clearances and permits

PROJECT MANAGEMENT AND ADMINISTRATION

The consultant will submit monthly invoices, in CDOT's format. Invoices will include a summary of work performed for the period, and progress status. The consultant will also perform other paperwork and reporting, required by CDOT or otherwise necessary, to administer and manage the task order.

SCHEDULE AND BUDGET

The consultant will perform the work for a not-to-exceed amount of \$ XXX,XXX. The completion date for all services under this task order is 04/30/2024.