RESOLUTION NO. _____

A RESOLUTION AUTHORIZING THE ADMINISTRATOR FOR THE DEPARTMENT OF TRANSPORTATION TO ENTER INTO AN AGREEMENT FOR PROFESSIONAL ENGINEERING SERVICES WITH CDM SMITH RELATIVE TO CITY CONTRACT NO. T-14-039, FOR EVALUATION OF AND DESIGN SERVICES FOR THE REHABILITATION OR REPLACEMENT OF THE STANDIFER GAP ROAD BRIDGE, FOR AN AMOUNT NOT TO EXCEED TWO HUNDRED SEVENTY-THREE THOUSAND ONE HUNDRED NINETY-FIVE DOLLARS ($273,195.00).

_____

BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF CHATTANOOGA, it is hereby authorizing the Administrator for the Department of Transportation to enter into an agreement for professional engineering services with CDM Smith relative to City Contract No. T-14-039, for evaluation of and design services for the rehabilitation or replacement of the Standifer Gap Road Bridge, for an amount not to exceed $273,195.00.

ADOPTED: _____, 2015

/mem

City of Chattanooga

Resolution/Ordinance Request Form

Date Prepared: 7/17/15

Preparer: Eddie Tate **Department:** Transportation

Brief Description of Purpose for Resolution/Ordinance: **Res./Ord. #** _____ **Council District #** 6

A resolution authorizing the Administrator of the Department of Transportation to enter into an agreement for Professional Engineering Services with CDM Smith relative to City Contract No. T-14-039 for evaluation of and design services for the rehabilitation or replacement of the Standifer Gap Road bridge for an amount not to exceed $273,195.00.

Name of Vendor/Contractor/Grant, etc.	CDM Smith	New Contract/Project? (Yes or No)	Yes
Total project cost	$ 273,195.00	Funds Budgeted? (YES or NO)	Yes
Total City of Chattanooga Portion	$ 273,195.00	Provide Fund	4022
City Amount Funded	$ 273,195.00	Provide Cost Center	P20402
New City Funding Required	No	Proposed Funding Source if not budgeted	
City's Match Percentage %	100%	Grant Period (if applicable)	

List all other funding sources and amount for each contributor.

Amount(s)	Grantor(s)
$	
$	
$	

Agency Grant Number

CFDA Number if known

Other comments: (Include contingency amount, contractor, and other information useful in preparing resolution)

Approved by: _____

Reviewed by: FINANCE OFFICE — DESIGNATED OFFICIAL/ADMINISTRATOR

Please submit completed form to @budget, City Attorney and City Finance Officer

Revised: October, 2011

651 East 4th Street, Suite 100
Chattanooga, TN 37403
tel: 423-322-0130

July 9, 2015

Ms. Brent Derrick
Engineering Manager
Chattanooga Department of Transportation

RE: Standifer Gap Road Bridge Rehabilitation or Replacement

Dear Ms. Derrick:
CDM Smith is pleased to have been selected to provide professional engineering services for the Standifer Gap Road Bridge Rehabilitation or Replacement. The primary objective of the project is to provide a cost-effective solution for the critical rated bridge that best meets the needs and expectations of the CDOT and stakeholders while serving both vehicular and pedestrian traffic safely and efficiently.

Based on our recent discussions, we anticipate the project will be completed in three phases:

- **Existing Conditions Evaluation, Rehabilitation/Replacement Recommendation**
  Detailed Structural Inspection
  Design Workshop
- **Preliminary and Construction Plans Development**
- **Bid Phase and Construction Administration**

The Scope of Services and Fees for Tasks 1 and 2 are detailed in Attachments A and B. The Scope and Fees for the Task 3 Bid Phase and Construction Administration will be submitted to CDOT after Construction Plans are developed, as requested.

CDM Smith proposes to complete this assignment under a Lump Sum contract with a budget of **$273,195.00,** which is inclusive of direct expenses and subcontracts. This budget will not be exceeded without your written approval. We anticipate that this letter proposal will be included as an exhibit of the City of Chattanooga prepared Contract Agreement for Engineering Services. These documents together shall serve as our agreement for the engineering services for this project.

We appreciate the opportunity to present this proposal and look forward to working with you and the CDOT staff to develop this critical project. Please advise if additional information or explanation is needed at this time.

Sincerely,
CDM SMITH

John T. Hunter, P.E.
Project Director

CDM Smith
Standifer Gap Road Bridge Rehabilitation or Replacement
City of Chattanooga
Department of Transportation

SCOPE OF SERVICES

PROJECT DESCRIPTION

The Chattanooga Department of Transportation has requested Scope and Fees professional consulting services related to the Standifer Gap Road Bridge Rehabilitation or Replacement. The primary objective of the project is to provide a cost-effective solution for the critical rated bridge that best meets the needs and expectations of the CDOT and stakeholders while serving both vehicular and pedestrian traffic safely and efficiently.

SCOPE OF WORK

Task 1

Existing Conditions Evaluation, Rehabilitation/Replacement Recommendation

CDM Smith shall review and evaluate all the existing TDOT bridge inspection reports and field verify the inspection information. Identifying issues or restrictions early in the evaluation process will ensure the success, particularly if a rehabilitation is the selected alternative. With this information, the design team will explore options for rehabilitation and replacement of the existing bridge and develop preliminary estimates of probable construction costs for each. The options available will be a balance between what is structurally efficient and cost effective, and meets CDOTs expectations for this project.
The CDM Smith Team will produce a **Detailed Structural Inspection and Recommendation Report** that will clearly define the findings of the detailed structural inspection, describe the rehabilitation and/or replacement option, provide preliminary estimates of probable cost comparisons for the options, and recommend the most practical option to advance to design. Upon submittal of this Report, CDM Smith will conduct a **Design Workshop** in cooperation with CDOT. This will identify the key issues related to the recommendations and allow for consensus prior to proceeding with plans development.

The task will include the following items:

- Detailed Structural Inspection and Report
    - Existing Conditions as documented in the Structural Inspection, Environmental and Geotechnical Reviews, the environmental, geotechnical and hydraulic reports will be included as appendices
    - Hydraulics Study
    - Preliminary Environmental and Geotechnical Review
    - Preliminary Estimates of probable construction costs for rehabilitation and full replacement
    - Design Recommendations
- Design Workshop with CDOT

Detailed Structural Inspection
CDM Smith anticipates the following services for the detailed structural inspection, evaluation, report preparation, cost estimate and recommendation:

- Review and evaluate all TDOT bridge inspection reports
- Prepare field sketches for purposes of documenting the findings from the detailed structural bridge inspection
- Perform detailed structural bridge inspection to field verify previous TDOT findings and document any additional findings
- Detailed inspection will include effort to quantify repair items for purposes of preparing a cost estimate for bridge rehabilitation
- Evaluate options for bridge rehabilitation or replacement to include coordination with hydraulic engineer
- Prepare inspection report with recommendations including preliminary estimate of probable cost for bridge rehabilitation & bridge replacement based on TDOT's most current average unit prices
- Attend Design Workshop with CDOT

Field Survey
To provide complete survey information for the design of the bridge replacement or rehabilitation, we propose to perform the following field survey work:

- Establish project control tied to the TDOT's geodetic reference network. We will utilize Trimble GPS surveying equipment for the primary project control and a Trimble Robotic Total Station for additional secondary control.
- Court house deed research of approximately 6 Tracts at the Hamilton County Register of Deeds.
- Contact Tennessee One Call to assist with locating underground utilities. The underground utilities will be based on above ground evidence and may vary from where shown on the survey base map. This proposal does not include any subsurface utility investigation.
- Field survey existing property corners and right-of-way monuments along the project corridor. If sufficient monumentation along the right-of-way cannot be recovered, we will search for additional property corners along the rear property lines.
- Provide field surveying of the existing topography, planimetrics, and the utility and drainage facilities along the project corridor. The total length of survey is approximately 2000'. The field survey will be approximately 100' in width, extending approximately 50' each direction from the centerline of the existing alignment.
- Obtain cross sections of Friar Branch approximately 200' from the existing bridge, both upstream and downstream, as well as measuring the bridge opening for the hydraulic analysis.
- Process field survey data and prepare survey base mapping utilizing Microstation CADD software and Geopak Surveying software. This mapping will include 2d planimetrics and 3d digital terrain model.
- Calculate existing property lines and right-of-way lines utilizing the property corners and right-of-way monuments found in the field and develop property maps that identify ownership with bearing and distance labels.

Hydraulics Study

Based on a preliminary investigation of available data, the existing bridge is inundated by the 10-year storm event. Based on TDOT guidelines, it is recommended for roadway bridge bottom beam elevations to be placed above a 10-year runoff frequency water surface elevation. Therefore, CDM Smith anticipates the following services for the Hydraulics Study to determine a new bridge hydraulic opening to satisfy a "no-impact" on the current floodplain and floodway boundary limits. The analysis will coordinate with the roadway and structural designers to determine an optimal vertical roadway alignment and bridge span.

The analysis for a "no-impact" certification will follow FEMA and Hamilton County guidelines. The hydraulic design analysis for the bridge crossings will be based on TDOT's Design Procedures for Hydraulic Structures, 2004.

- Obtain current HEC-RAS models from TVA, USACE, Locality, or FEMA

This task will involve obtaining current available models (or available data) from USACE, TVA, Locality, or FEMA that will best match the effective FIS and FIRM. For the basis of this proposal it is assumed the obtained model will match the effective FIS and FIRM.

- Create hydraulic profile model in HEC-RAS

The vertical datum will be verified from field survey and compared with obtained hydraulic model. This task is already included within the contracted surveying services. If a significant difference in elevation is observed, a correction factor will be applied to results. New cross sections within models will be developed from the same survey data as used for the preliminary roadway design as deemed necessary. In addition, based on the current FIS it is assumed the hydrology is adequately represented and that no further hydrology analysis will be necessary.

If the HEC-2 data supplied through FEMA and TVA is found to produce results that match the published FEMA data and the current FIRM mapping, that model will be considered to be the Duplicate Effective Model (DEM), and will be the basis for comparison for this project. Once acceptable DEMs are produced, the models will be converted to HEC-RAS for all future modeling scenarios. Corrected Effective Models (CEM) will be produced for each stream to correct any errors found in the DEMs if necessary. Also, in the event that the acquired HEC-2 data does not produce results which correspond to the published FEMA data, or if errors are found in the model, those issues will be corrected in the CEMs. Existing Conditions Models (ECM) will be created to use as a basis for comparison to the proposed roadway realignment. The ECMs will incorporate additional surveyed cross-sections at and around the project site as deemed necessary, as well as any adjustments necessary to Manning's n values to duplicate existing conditions. A Proposed Conditions Model (PCM) will be developed to represent the proposed bridge and modification to the roadway approaches and to determine a "no-impact" to the base flood elevations from the effective FIRM. We will work closely with the roadway and structures design team to establish an optimal bridge opening and a vertical roadway alignment based on the hydraulic impacts.

- Produce report discussing methods used and changes to the models

The report will describe the methods used and changes performed to produce hydraulic models representing the existing and proposed conditions for the project. The report will document any changes to the existing conditions to establish a "No-Impact" to the FEMA base flood elevations,

floodway elevations and floodway top widths resulting from the proposed bridge replacement and roadway vertical realignment.

Preliminary Geotechnical and Environmental Assessment

CDM Smith's geotechnical and environmental staff anticipates the following to support the development of conceptual design recommendations and estimates of probable construction cost:

- Visit site to document surface conditions, jurisdictional features, and plan subsurface exploration.
- Perform search of available geologic related mapping in the vicinity of the project.
- Initial Environmental Assessment, including identification of potential hazardous substances onsite (i.e. asbestos, lead paint), hydrologic assessment of natural resources, or other environmental restrictions
- Review available bridge maintenance records, design plans/drawings, published geologic mapping, etc.
- Develop preliminary recommendations related to bridge foundations, wing walls, earthwork, pavements, construction and demolition methods
- Documenting findings and preliminary recommendations in report

Design Workshop with CDOT

When the Detailed Structural Inspection and Recommendation Report is complete, a review meeting will be conducted, and CDM Smith will be responsible for providing meeting minutes detailing comments and changes as a result of CDOT's review of the report and the meeting. These changes will be incorporated into the preliminary and construction plans development.

Task 2
Preliminary and Construction Plans Development

Based on the decisions reached by CDOT during the Design Workshop, CDM Smith will proceed to develop the Preliminary Plans.

Preliminary Roadway Plans

Preliminary Roadway Design plans will be prepared at a scale of 1" = 50' in English units in accordance with TDOT design standards and criteria, current edition as of the date of this executed scope of work. CDM Smith will utilize MicroStation V8i and GEOPAK software in preparation of the design plans.

The design team will coordinate with all utility companies to ensure that affected utilities and their relocation efforts are addressed during the design effort.

Geotechnical Report

CDM Smith's geotechnical staff anticipates the following Geotechnical Exploration Supporting Final Design:

- Determine locations of borings for staking by project surveyors and for utility clearance purposes. Budget for the location of borings is included under the field survey budget.
- In order to complete the geotechnical exploration, access onto private property may be required. A list of desired boring locations and affected private properties will be given to the City in order for entry authorization to be obtained on behalf of CDM Smith and its subcontractor(s).
- Drill between two and four borings to at least the top of auger refusal material (i.e., bedrock) near the ends of the replacement bridge. Rock core sampling of auger refusal materials will be performed in at least two of the borings. The depth to rock in the borings is assumed to be 40 feet. A total coring footage of up to 40 feet has been assumed.
- Drill between up to two borings along approaches on both sides of the creek crossing to assess the subsurface conditions where the roadway may be permanently shifted. Borings will extend to target depths of up to 15 feet or to auger refusal material. Coring of auger refusal materials in the roadway borings is not proposed.
- Flaggers and traffic control devices will be employed to drill borings in the travel lanes or along the shoulder of Standifer Gap Road. Traffic control plans will be submitted for approval by the City prior to executing the field work and that approved work hours will be at least between 9 AM and 3 PM on weekdays.
- Obtain disturbed soil samples on regular intervals in all of the borings by the Standard Penetration Test. A bulk sample of auger cuttings will also be gathered.
- Backfill borings outside existing travel lanes with soil cuttings. Any borings drilled in travel lanes or paved shoulders will be backfilled full depth with gravel (or grout) and topped with quick-set concrete or high viscosity asphalt patch.
- Perform laboratory testing to likely include natural moisture, plasticity and grain-size distribution determinations. A standard Proctor compaction and 1-point California Bearing Ratio tests will be performed on the collected bulk sample.
- Perform geotechnical engineering analyses and prepare recommendations to aid design of the bridge, pavement, and earthwork. It is assumed that others will provide design scour elevations for foundation elements. Pavement thickness design will be prepared based on subsurface findings and on projected traffic demands. It is assumed that design traffic information will be provided by others.
- Prepare a written report detailing our subsurface findings, laboratory test results, and geotechnical recommendations for design and construction.

Structural Design

CDM Smith proposes to provide the following services for the preliminary and final structural engineering effort required to produce construction plans for Standifer Gap Road Bridge:

- The replacement bridge shall be designed for an HL-93 vehicular loading with auxiliary pedestrian loading
- The bridge width shall be determined during design, but at a minimum shall consist of two lanes at 12’ minimum each, one sidewalk, one 1’ pedestrian rail section, and one traffic rail section. A bicycle path is to be considered during the Preliminary Bridge Layout phase
- The bridge deck shall consist of simply reinforced concrete on longitudinal girders
- It is anticipated that the bridge shall be framed with pretensioned concrete girders
- All geotechnical parameters for abutment design to include recommendations for piles, depth to rock, bearing capacity, lateral soil pressures, etc. shall be performed by CDM Smith’s geotechnical engineer

- All bridge plans will be prepared in accordance with TDOT's construction standards and specifications (January 1, 2015 Edition) along with all the applicable TDOT Standard Drawings and design guidelines and submitted along with a final cost estimate to the City for construction purposes
- AASHTO LRFD Bridge Design Specifications, Fifth Edition, 2010, with interims shall be used for design
- It is anticipated that a Preliminary Bridge Layout and preliminary cost estimate will be developed and provided to the City for their review and comment
- Bills of Steel are to be prepared
- Estimated Quantities are to be developed

Public Involvement

Upon completion of the preliminary plans, CDM Smith anticipates attending a Design Public Meeting. CDM Smith will prepare a location map for CDOT's use in advertising for the Design Public Meeting. In addition, CDM Smith will prepare and print a large, color-coded exhibit of the proposed improvements to be displayed at the public meeting. If desired by CDOT, CDM Smith will assist in conducting a presentation for the meeting.

Final Construction Plans

Once the preliminary roadway plans have been approved, the project team will complete the final roadway design plans for the project. This scope and fee assumes that construction quantities will be calculated, and the items numbers will be consistent with the TDOT format and standard.

The following tasks and features will be included in this phase:

- Permitting: We will provide any necessary documents including a Storm Water Pollution Prevention Plan (SWPPP) and Aquatic Resource Alteration Permit (ARAP) for construction of the project.
- Pavement Design: The roadway pavement thicknesses required and the materials for both vehicular and pedestrian surfaces including travel lanes, bicycle lanes, curbing and sidewalks will be determined based on the City of Chattanooga standards.
- Sidewalk Design: City of Chattanooga standards for sidewalk design will be followed, and we will ensure that ADA guidelines are adhered to. This scope assumes that no structural sidewalks will be required.
- Drainage Design: We will design a drainage system that manages the 10-yr design storm for all longitudinal systems and the 25-yr design storm for cross drains. We will use a combination of natural and structural systems for this effort.
- Erosion Control: We will prepare plans for erosion and sedimentation controls in accordance with the TDEC's BMPs and secure any additional environmental permits for plan approval and construction not obtained previously.
- Roadway Signing and Pavement Marking: We will detail requirements for regulatory roadway signs and pavement markings in accordance and conformance with the MUTCD and CDOT's requirements.
- Maintenance of Traffic for Construction: We will detail the requirements of the construction detours to minimize impact to the traveling public, local businesses and neighborhood.

When the Preliminary and Construction Plans are complete, a review meeting will be conducted, and CDM Smith will be responsible for providing meeting minutes detailing comments and changes as a result of CDOT's review of the plans. These changes will be incorporated into the plans, and PDF's of the plans will be submitted to CDOT for final review.

Items not included in the Current Scope of Services

The following items are not included in the current scope of services for this proposal. Should these tasks be required, a scope and fee will be determined at that time. These items include:

- Proposed Right of Way and/or easement calculations, ROW Acquisition Services
- Public Perception Surveys
- Overhead lighting design
- Utility Design within the project area (All utilities in conflict with the bridge shall be relocated by others)
- No architectural treatment or landscaping requirements will be required on the bridge or project area.

Assumptions

This scope was developed based upon the assumptions listed below. In the event that the selected alternative requires a different level of effort than what is listed in this scope of services CDM Smith and CDOT will reevaluate the scope and fees at that time.
These assumptions include:

- Standifer Gap Road Bridge will be a full replacement.
- The replacement bridge is anticipated to be a single span structure that will be sufficient for the hydraulic opening eliminating the need for an intermediate pier.
- Standifer Gap Road Bridge will remain on the same horizontal alignment within existing right of way.
- Standifer Gap Road Bridge will be closed to through traffic throughout the duration of construction. A traffic detour shall be provided such that phase construction of the bridge will not be required.
- There will be no lighting or utilities on the bridge.

CDM Smith
Standifer Gap Road Bridge Rehabilitation or Replacement
City of Chattanooga
Department of Transportation

Attachment B
Fees

Task 1
Existing Conditions Evaluation, Rehabilitation/Replacement Recommendation

Detailed Structural Inspection and Recommendations Report	$24,115.00
Field Survey	$16,700.00
Hydraulics Study	$21,700.00
Preliminary Geotechnical and Environmental Assessment	$7,100.00
Design Workshop with CDOT	$3,200.00
Total TASK 1	$72,815.00

Task 2
Preliminary and Construction Plans Development

Structural Design	$101,590.00
Roadway Design	$80,790.00
Geotechnical Report	$18,000.00
Total TASK 2	$200,380.00

Total	**$273,195.00**