

**WORK AUTHORIZATION NO. 1**

**PROJECT: Professional Engineering Design Services for Culverts**

This Work Authorization is made pursuant to the terms and conditions of the Williamson County Contract for Engineering Services, being dated **January 17, 2017** and entered into by and between Williamson County, Texas, a political subdivision of the State of Texas, (the "County") and **Steger Bizzell Engineering, Inc.** (the "Engineer").

Part 1. The Engineer will provide the following Engineering Services set forth in Attachment "B" of this Work Authorization.

Part 2. The maximum amount payable for services under this Work Authorization without modification is **\$215,000.00**

Part 3. Payment to the Engineer for the services established under this Work Authorization shall be made in accordance with the Contract.

Part 4. This Work Authorization shall become effective on the date of final acceptance and full execution of the parties hereto and shall terminate on **September 30, 2017**. The Engineering Services set forth in Attachment "B" of this Work Authorization shall be fully completed on or before said date unless extended by a Supplemental Work Authorization.

Part 5. This Work Authorization does not waive the parties' responsibilities and obligations provided under the Contract.

Part 6. County believes it has sufficient funds currently available and authorized for expenditure to finance the costs of this Work Authorization. Engineer understands and agrees that County's payment of amounts under this Work Authorization is contingent on the County receiving appropriations or other expenditure authority sufficient to allow the County, in the exercise of reasonable administrative discretion, to continue to make payments under this Contract. It is further understood and agreed by Engineer that County shall have the right to terminate this Contract at the end of any County fiscal year if the governing body of County does not appropriate sufficient funds as determined by County's budget for the fiscal year in question. County may effect such termination by giving written notice of termination to Engineer.

Part 7. This Work Authorization is hereby accepted and acknowledged below.

EXECUTED this 7<sup>th</sup> day of February, 2017.

ENGINEER:

Steger Bizzell Engineering, Inc.

By: \_\_\_\_\_

Signature

~~Perry Steger~~ Patrick J. Stevens  
Printed Name

Vice President  
Title

COUNTY:

Williamson County, Texas

By: \_\_\_\_\_

Signature

DAN A. GATTI  
Printed Name

County Judge  
Title

## LIST OF ATTACHMENTS

Attachment A - Services to be Provided by County

Attachment B - Services to be Provided by Engineer

Attachment C - Work Schedule

Attachment D - Fee Schedule

### **Attachment A - Services to be Provided by County**

Williamson County Road & Bridge Division personnel will provide project direction, review and oversight.

## **Attachment B - Services to be Provided by Engineer**

See attached.

**Attachment B**  
**Services to be Provided by Engineer**  
**Work Authorization #1**  
Professional Engineering Design Services for Culverts

General Description of Project:

This project consists of replacement of existing culverts under roadways maintained by Williamson County. Replacement structures may include round or arch pipe culverts, or box culverts.

Twenty existing structure locations identified by County staff are included in the scope of this replacement program. The structures are detailed on the attached exhibit and incorporated into this document. Changes to the list of structures may result in a change to the scope and fee of this Work Authorization.

TASK 1: PROJECT MANAGEMENT

1. Preparation and submittal of a project-specific QA/QC Plan for approval within 30 days of Notice-to-Proceed.
2. Schedule and conduct a project kick-off meeting between Consultant(s) and County Road & Bridge staff. Review and discuss preliminary design parameters such as design storm, desired structure types/materials, traffic control methods, roadway approach design criteria, environmental issues, field surveying requirements, and landowner coordination.
3. Schedule and conduct a workshop after Preliminary Engineering to review H&H recommendations and proposed order of magnitude cost estimates in order to prioritize which culvert should be designed.
4. Schedule up to 4 additional milestone review meetings.
5. Update project design schedule monthly.
6. Management and oversight of subconsultant(s).

TASK 3: PRELIMINARY ENGINEERING

1. Collect and review available data relevant to the culvert replacement project areas, including the County's existing culvert inventory database in GIS format.
2. Conduct field reconnaissance to document existing conditions and collect data including a photographic record, noting in particular any change or deviation from the County's inventory data.
3. Receive field surveying (topographic) and property boundary information from the County's surveying consultant. Files shall contain, at a minimum, linework representing edge of pavement, roadway centerline, culvert flowlines, headwalls/wingwalls, fencing, topographic contour lines at 1-foot intervals (including a separate surface file), above-ground utility appurtenances or markings (County's surveying consultant to coordinate 811 locates), and any other existing features pertinent to this project. Files shall be in Microstation DGN, Geopak GPK, and surface TIN formats.
4. Prepare a culvert summary document that consolidates information known about each culvert, such as: existing structure configuration (size, material, number), location, municipal review authority (if applicable), environmental concerns (as determined by others), approximate watershed basin size, roadway ADT (if known and provided by others), apparent nearby utilities, and apparent right-of-way width. Additionally, the document will estimate the complexity of design of a replacement structure relative to the other culverts in this program. This subjective

rating will be used internally to schedule work progress and also to assist in determining bid packages (detailed below).

5. Perform an "existing-conditions" hydrologic study of the watershed of each culvert to be replaced. Determine land use types, soil types, slope ranges, and other parameters of the watersheds. Calculate peak storm water runoff rates for the 2-, 5-, 10-, 25-, 50-, and 100-year storms using HEC-HMS software.
6. Perform an "existing-conditions" hydraulic study of each culvert to be replaced. Existing culvert and roadway survey data will be provided by others. Non-bridge-class culverts will be modeled using FHWA HY-8 or similar software. Bridge-class culverts will be modeled using HEC-RAS software, with each cross sections created from aerial contour data provided by the County.
7. Determine preliminary potential replacement structure configurations (size, quantity, material, inlet/headwall style, slope, cover).
8. Perform a "proposed-conditions" hydraulic study of the replacement structures using the same methodology as the "existing-conditions" study. Compare the results of the two models and identify any adverse impacts in the proposed conditions. Adverse impacts may include a water surface elevation increase greater than an accepted tolerance value, increased downstream velocity, and increased scour potential. Revise the potential replacement structure configuration to limit adverse impact(s) or determine appropriate mitigation solutions.
9. Present the preliminary results to County staff and solicit input. Revise the models as requested, if necessary. Provide hydrologic and hydraulic models to the County in an electronic format. No written or sealed drainage report shall be prepared.
10. Coordinate with the County's selected utility coordination consultant, such as providing design files and draft construction plan sheets as requested. Import and review files received from the utility coordination consultant. File sent to and received from the utility coordination consultant shall be in Microstation DGN format.

#### TASK 4: GEOTECHNICAL INVESTIGATION

1. Perform soil borings to a depth of 10 feet (assumes one culvert location with two borings).
2. Laboratory analysis of soil, including: Atterberg limits, sieve analysis, CU bar triax compression, unconfined compressive strength, consolidation, California Bearing Ratio, and moisture content.

#### TASK 5: ENVIRONMENTAL STUDIES

1. Review applicability of concerns identified by others to all structures under this WA. Environmental concerns (if any) shall be used to consider the impact of the proposed culvert designs and the grouping of the culverts into three bid packages.
2. Coordinate and provide a Geologic Assessment of one culvert location in compliance with the Georgetown Water Quality (Salamander) requirements. GA shall be provided by subconsultant.

#### TASK 7: FLOODPLAIN MODELING

1. Obtain and review available Flood Insurance Rate Maps (FIRMs), Flood Insurance Study (FIS) data, and any effective floodplain model(s).
2. Update the model(s) based on the proposed improvements identified during the Preliminary Engineering phase. Prepare pre-project and post-project models and quantify impacts attributable to the proposed project. This Work Authorization assumes that no adverse impacts will result from the proposed improvements that would trigger coordination with FEMA (such as a CLOMR/LOMR). A separate task order will be issued by the County if a CLOMR/LOMR is actually needed.

#### TASK 8: FINAL ENGINEERING

This Work Authorization assumes that three separate construction contracts will be awarded, and each one managed independently.

1. Conduct a Final Engineering kick-off meeting between Engineer, County staff, and other Consultants as necessary. The purpose of the meeting shall be to identify the replacement priority of each crossing and to discuss strategies for grouping replacement plans into bid packages. An updated culvert summary document (initially prepared during Preliminary Engineering) shall help guide the decision-making.
2. Coordinate with the County's surveying consultant on necessary easement areas by providing electronic linework of proposed limits in Microstation DGN format.
3. Prepare construction plans, to be developed in 50% and 100% submittals. Wherever possible, the designs shall be based on TxDOT 2014 Specifications, and standard details shall be current TxDOT Standards at execution date of this Work Authorization. Plans will be prepared using Microstation V8i in DGN format. It is assumed that three plan (i.e. bid) sets will be prepared. Each plan set will include, but not be limited to, the following information:
  - a. Cover Sheet
  - b. Project Layouts
  - c. General Notes and Specifications
  - d. Estimates and Quantities
  - e. Traffic Control
    - i. Construction Sequencing Narrative
    - ii. Detour Plan (if necessary)
    - iii. Standards
  - f. Roadway Plan and Profile (P&P) Sheets (if changes to approaches are proposed) including standards. The scope of this Work Authorization is limited to two locations for which the approaches are being modified and a roadway P&P sheet is necessary.
  - g. Drainage
    - i. Drainage Area Map
    - ii. Hydrologic and Hydraulic Design Data
    - iii. Cross-Culvert Layouts
    - iv. Channelization Layout (if necessary for grading within drainage easement; limited to five locations)
    - v. Standards
  - h. Signing, Striping, and Delineation (may be combined with other sheets)
    - i. Signing and Striping Layouts
    - ii. Standards
  - i. Erosion Control (may be combined with other sheets)
    - i. Erosion and Sedimentation Control Layouts
    - ii. Standards
4. Prepare estimated project quantities for each submittal. Wherever possible, bid items shall conform to TxDOT 2014 bid codes.
5. Prepare a probable cost of construction based on estimated quantities and current local bid prices, and submitted with each submittal package.
6. Prepare and compile a Project Construction Manual using the appropriate Williamson County Road & Bridge template (no federal funds, off-TxDOT system), including selection of relevant and required technical specifications, with the 100% submittal.



7. Prepare submittal packages and send to County Road & Bridge staff for review. (The County's General Engineering Consultant will not participate in this project.) Meet with County staff to discuss comments. Prepare responses to review comments.
8. Prepare and submit a permit application(s) to the Williamson County Floodplain Administrator for crossings outside of FEMA jurisdictions (i.e. Zone AE).

#### TASK 9: BIDDING PHASE SERVICES

County staff shall coordinate the bidding phase. This Work Authorization does not include any Bidding Phase Services provided by the Engineer.

#### TASK 10: CONSTRUCTION PHASE SERVICES

County staff shall coordinate the construction phase processes. Engineer's scope of work during these phases shall be limited to the following:

1. Review and process Requests for Information. Limited to 4 RFI's.

#### DELIVERABLES

The following is a list of deliverables to be provided under this Work Authorization.

1. Quality Assurance/Quality Control Plan
2. Two PS&E submittal packages (referred to as 50% and 100%)
3. Electronic H&H models (HEC-HMS and HEC-RAS or HY-8)

#### EXCLUSIONS

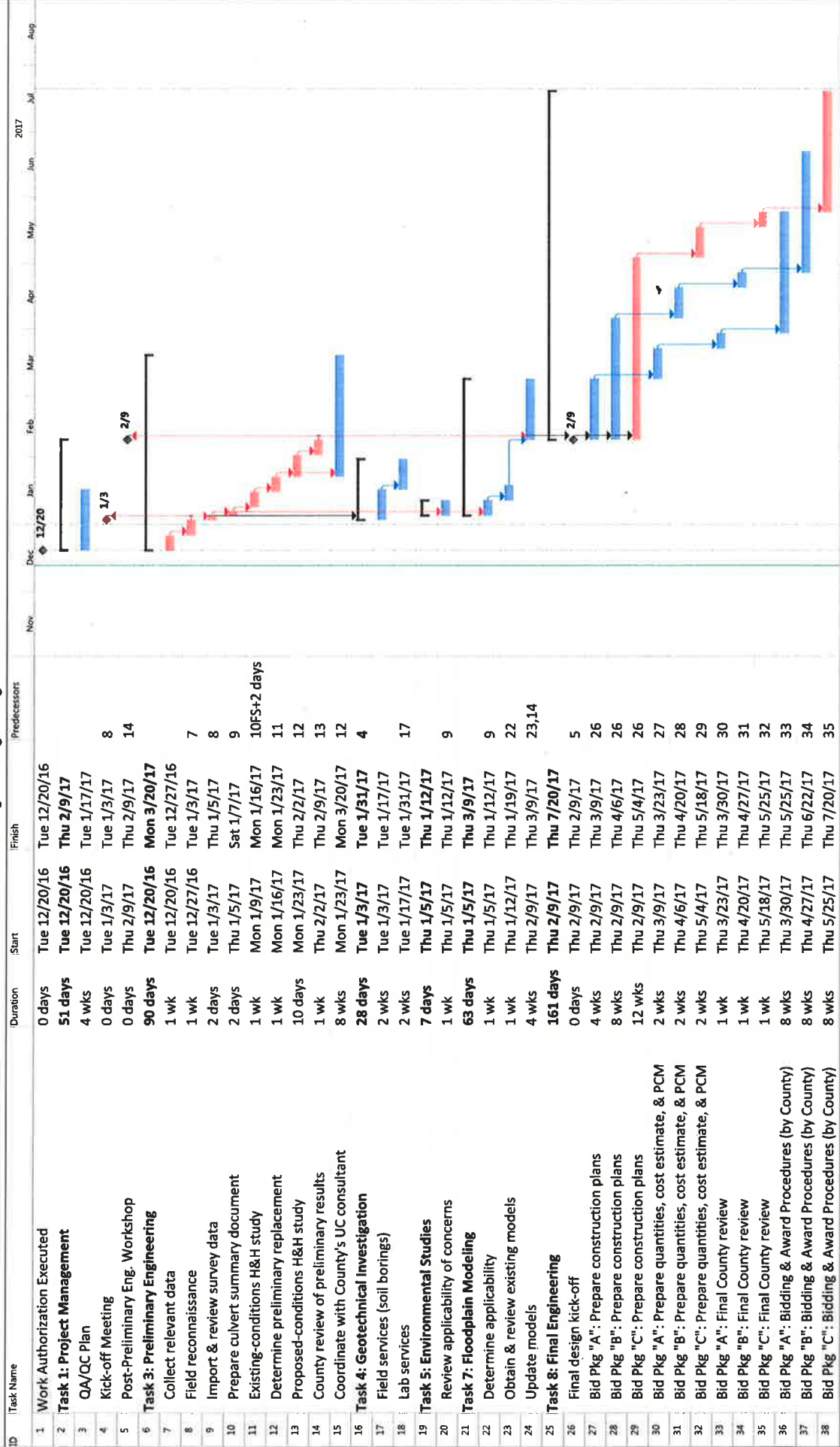
The following services are specifically excluded from this Work Authorization. These services may be included in future work authorizations.

1. Drainage Report (electronic H&H models will be provided to the County)
2. Geotechnical Report or Pavement Design
3. Bridge layout or design
4. Retaining wall layout or design
5. FEMA Coordination, such as CLOMR/LOMR permitting
6. Floodplain permitting
7. Utility relocation design or coordination, except as noted above
8. Traffic Impact Analysis, or any traffic counts except as provided by others
9. Field surveying, including Right-of-Entry
10. Right-of-way or easement acquisition, except support services as noted above
11. Reset missing property corner pins or other permanent monumentation
12. Survey or excavation of underground utilities (survey for SUE shall be performed by separate County consultant)
13. TCEQ Coordination
14. Municipal review or permitting, except as noted above
15. Regulatory agency or municipality review fees
16. Historical assessment
17. Bidding Phase Services (addenda, bidder Q&A, bid tabulations, etc.)
18. Construction Phase Services, except for assistance with RFI's as noted above

### **Attachment C - Work Schedule**

See attached.

**Attachment C**  
**Work Authorization #1**  
**Professional Engineering Design Services for Culverts**



## **Attachment D - Fee Schedule**

See attached.

## Attachment D

## Work Authorization #1

Professional Engineering Design Services for Culverts

## Estimated Fee Schedule

Steger Bizzell

Michael Baker

Task and Description	Senior Engineer	Engineer (PE)	Engineer in Training	CADD Technician	Clerical	Deputy PM	Senior Engineer	Design Engineer	Engineer in Training	Sr Env Specialist	Sub-consultant	Total Estimate
Hourly Rate: \$	216 \$	161 \$	133 \$	100 \$	72 \$	220 \$	200 \$	140 \$	120 \$	166		
<b>TASK 1: PROJECT MANAGEMENT</b>												
1 Prepare QA/QC Plan	1	2	4			1						\$1,290
2 Project Kick-off Meeting		6	4			2	4					\$2,738
3 Post-Preliminary Engineering Workshop		6	4			4	6					\$3,578
4 Milestone Review Meetings (4 max)		12	8			8	12					\$7,156
5 Update Project Schedule Monthly		8				6						\$2,608
6 Management & Oversight of Subconsultant(s)	1	4										\$860
Subtotal Hours:	2	38	20	0	0	21	22	0	0	0	0	103
Subtotal Fees:	\$432	\$6,118	\$2,660	\$0	\$0	\$4,620	\$4,400	\$0	\$0	\$0	\$0	\$18,230
<b>TASK 3: PRELIMINARY ENGINEERING</b>												
1 Collect available data		2	4			2	1	1	2			\$1,698
2 Field reconnaissance & documentation		6	8				4	8				\$3,950
3 Process field surveying data		2	8	12				2	20			\$5,266
4 Prepare culvert summary and complexity rating	1	6	4			1	2	4				\$2,894
5 Existing conditions hydrologic study (20 locations)		8	20			1	1	8	20			\$7,888
6 Existing conditions hydraulic study (20 locations)		16	20			1	4	12	20			\$10,336
7 Preliminary replacement design (20 locations)	2	8	20			1	4	8	16			\$8,440
8 Proposed conditions hydraulic study (20 locations)	2	12	28			1	3	10	28			\$11,668
9 Present to County and revise		8	12			2	8		12			\$6,364
10 Coordinate with County's UC consultant		4	16									\$2,772
Subtotal Hours:	5	72	140	12	2	8	27	54	116	0		436
Subtotal Fees:	\$1,080	\$11,592	\$18,620	\$1,200	\$144	\$1,760	\$5,400	\$7,560	\$13,920	\$0	\$0	\$61,276
<b>TASK 4: GEOTECHNICAL INVESTIGATION (see attached Corsair fee schedule)</b>												
1 Soil borings											\$4,650	\$4,650
2 Laboratory Analysis											\$2,141	\$2,141
Subtotal Hours:	0	0	0	0	0	0	0	0	0	0	0	0
Subtotal Fees:	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$6,791	\$6,791
<b>TASK 5: ENVIRONMENTAL STUDIES</b>												
1 Review applicability of concerns to each culvert												
2 Geologic Assessment (one culvert)		4	4	2		1	2		4	8		\$3,804
Subtotal Hours:	0	4	6	2	0	1	2	0	4	8		27
Subtotal Fees:	\$0	\$644	\$798	\$200	\$0	\$220	\$400	\$0	\$480	\$1,328	\$1,000	\$5,070
<b>TASK 7: FLOODPLAIN MODELING</b>												
1 Obtain and review available maps, studies, and models		4	8				4	8				\$3,628
2 Prepare pre- and post-project models		12	20				16	30				\$11,992
Subtotal Hours:	0	16	28	0	0	0	20	38	0	0	0	102
Subtotal Fees:	\$0	\$2,576	\$3,724	\$0	\$0	\$0	\$4,000	\$5,320	\$0	\$0	\$0	\$15,620

## Attachment D

## Work Authorization #1

Professional Engineering Design Services for Culverts

## Estimated Fee Schedule

Steger Bizzell

Michael Baker

Task and Description	Senior Engineer	Engineer (PE)	Engineer in Training	CADD Technician	Clerical	Deputy PM	Senior Engineer	Design Engineer	Engineer in Training	Sr Env Specialist	Sub-consultant	Total Estimate
Hourly Rate: \$	216 \$	161 \$	133 \$	100 \$	72 \$	220 \$	200 \$	140 \$	120 \$	166		
<b>TASK 8: FINAL ENGINEERING</b>												
1 Final Engineering phase kick-off meeting		8	4			4	4					\$3,500
2 Coordinate easements with surveyor		6	4					2	4			\$2,258
3 Prepare construction plans	4	80	120	80		8	12	60	200			\$74,264
4 Prepare project quantities		6	12					4	12			\$4,562
5 Prepare probable cost estimates	1	8	4			1	1	6				\$3,096
6 Prepare Project Construction Manuals	1	10	20			1	1	10				\$6,306
7 Submit and revise 50% and 100% packages	4	8	16			2	4	8	16			\$8,560
Subtotal Hours:	10	126	180	80	0	16	21	90	232	0		755
Subtotal Fees:	\$2,160	\$20,286	\$23,940	\$8,000	\$0	\$3,520	\$4,200	\$12,600	\$27,840	\$0		\$102,546
<b>TASK 10: CONSTRUCTION PHASE SERVICES</b>												
1 Review and process RFIs (4x)		12	8			2	4	8				\$5,356
Subtotal Hours:	0	12	8	0	0	2	4	8	0	0		34
Subtotal Fees:	\$0	\$1,932	\$1,064	\$0	\$0	\$440	\$800	\$1,120	\$0	\$0		\$5,356
TOTAL HOURS:	17	268	382	94	2	48	96	190	352	8		1,457
TOTAL FEES:	\$3,672	\$43,148	\$50,806	\$9,400	\$144	\$10,560	\$19,200	\$26,600	\$42,240	\$1,328	\$7,791	\$214,889