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June 20, 2016

Mr. Jack L. Murphy, PE
Senior Civil Engineer
City of League City
1535 Dickinson Ave.
League City, Texas 77573

**Subject: Nottingham Channel Improvements, Supplement (DR1102)
Proposal for Supplemental Professional Engineering Services**

Dear Mr. Murphy:

In July 2012, AECOM Technical Services, Inc., and the City of League City entered into a contract for professional engineering services to design stormwater improvements for the Interurban Channel north of FM 518 and the Nottingham Channel. The goal for both channels was to determine constructable alternatives that would stabilize the side slopes of the channels and provide for maintenance access in a cost effective way. The contract included Preliminary Engineering, Design Phase, Bid Phase, Construction Phase, Coordination, Survey, Environmental Analysis, Hydrologic and Hydraulic Analysis, Development of First Flush Goals, Geotechnical Analysis and reimbursable expenses. The contract amount was \$320,451.00.

On March 26, 2013, City Council approved Amendment No. 1 in the amount of \$61,100.00 for a Department of the Army individual permit application to gain authorization for construction of improvements to the Interurban Channel and the Nottingham Channel. The proposed construction included a 6' x 3' reinforced concrete box culvert with a swale above it to capture extreme event overflow and add additional capacity in the Interurban Channel. The Nottingham Channel design included a concrete lined channel. The Nottingham Channel includes an existing 16-inch AC water line that is exposed. The concrete lining would have covered and protected the water line. In May of 2013 new guidelines for the Stream Assessment Tool were released and applied to these projects. The resulting cost of stream bank mitigation led the team to change the design approach to avoid interaction with "Waters of the US". After reviewing constructable alternatives, the City of League City elected to eliminate the Interurban Channel from the project and pursue a low profile steel sheet pile wall for the Nottingham Channel.

In July 2014, the City issued Work Change Directive No. 2 in the amount of \$32,740.75 to modify the Nottingham Channel design parameters to avoid the need for an environmental permit from the US Army Corps of Engineers and the mitigation costs associated with USACE stream bank mitigation. This included redesign of the construction plans and additional geotechnical services.

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In December of 2014, AECOM delivered a 100% complete set of construction drawings for the Nottingham Channel improvements including a steel sheet pile wall. Due to the techniques used to construct a steel sheet pile wall and the delicate nature of the AC water line, it was decided that the wall would not be designed or constructed in the area of the water line. It was discussed that the water line may be rerouted or abandoned in the future, at which time the wall could be extended to provide the desired access for maintenance and bank stability. These plans were “shelved” to wait funding for construction. In January of 2016 the City of League City informed AECOM that funding had become available and we could proceed to construction. AECOM and the City met to review the project and determine if any updates to the construction plans would be needed. The following changes were identified.

1. The City determined that the 16-inch asbestos cement water line would be abandoned by June 2016 and that it could be removed and the steel sheet pile wall extended through this section. This section of sheet pile wall will need to be hydraulically modeled and any impacts mitigated. The construction plans and specifications will need to be revised prior to advertising for bids to reflect an additional 1,200 linear feet of sheet pile wall.
2. The hydraulic conditions described in the letter report prepared under the original agreement include the Interurban Channel improvements and concrete slope paving for the Nottingham Channel. The Interurban Channel improvements have been removed from the scope of work due to the stream bank mitigation expense and the Nottingham Channel improvements include a steel sheet pile wall on either side of the ditch instead of concrete slope paving. These are significant hydraulic changes that require modeling to determine if there are any water surface elevation impacts. If there are impacts a mitigation plan for those impacts should be determined, modeled, and implemented in the construction plans.
3. Improvements to the Nottingham Channel outfall into Interurban were determined to be beneficial. The improvements will include smoothing of the entrances to the outfall pipes to increase hydraulic efficiency and expansion of concrete slope paving to include two drainage swales. The length of the sheet pile wall should be decreased in the area of the concrete slope paving.
4. Minor modifications to the Calder Road headwalls to increase access for maintenance equipment should be added.

Scope of Services

The Scope of Services proposed herein are as follows.

Hydrologic & Hydraulic Modeling – AECOM will perform the necessary modifications to the existing and proposed hydrologic and hydraulic analyses for the Interurban Channel and Nottingham Ditch. This will include HEC-RAS and HEC-HMS model modification to current proposed conditions on Nottingham Ditch with existing conditions on Interurban Channel. The proposed condition will include the sheet pile wall offset 12 feet from the right-of-way on both sides of the channel with variations in the area with the wider right-of-way as well as sheet pile wall in the area where the 16-inch water line is located. The hydraulic conditions resulting from adding sheet pile wall to replace the 16-inch water line has not been previously modeled and impacts are expected. The impacts will need to be assessed and effective mitigation solutions added to the model and recalculated. This will be an

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iterative process until the appropriate mix of mitigation solutions is determined to resolve the impacts.

A detailed level of effort including a fee schedule is attached. The deliverable products will include a letter report describing the results of the proposed and successfully mitigated design for Nottingham Channel and an electronic copy of the models.

PS&E Revisions – The construction plans, project manual, and estimate of probable cost will be revised to include the removal of the 16-inch water line, the addition of the sheet pile wall, the relocation of the sheet pile wall to 12-feet from the right-of-way, modifications to the Calder Road headwalls, modifications to the outfall to Interurban, the addition of the two swales, and implementation of the mitigation plan determined by the hydraulic modeling. All of the plan and profile drawings and all of the cross section sheets will require modification. Two new plan and profile drawings will be created to detail the sheet pile wall in the area of the 16-inch water line. A detailed level of effort including a fee schedule is attached. The deliverable products will include approved construction plans, sealed Project Manual, an Estimate of Probable Cost, a bid tabulation, and recommendation of award. AECOM will advertise the project on CivCast and the City of League City will advertise in a local publication.

Construction Phase Services – The Construction Phase Services budget was reviewed and updated with current anticipated services that will be needed to construct the project. The budget includes up to 20 submittals and 15 RFIs. AECOM has adjusted the level of effort to match the existing budget of \$23,341.96. A detailed level of effort and fee schedule is attached for clarification.

Proposed Basis of Compensation

AECOM has determined that the time required to complete the Hydraulic Modeling under normal working conditions is three (3) weeks. Once the City has approved the mitigation design, it will take AECOM an additional four (4) weeks to complete the PS&E Revisions and approvals. Based on this time frame and the tasks detailed within this scope of work, AECOM requests a lump sum fee of \$81,180.26 for engineering services as shown in the table below. A more detailed breakdown can be found in the attachments, but for ease of reference, it is included here as well.

Description	Fee
Hydrologic & Hydraulic Analysis	\$ 14,195.71
PS&E Revisions	\$ 66,984.55
Total Request	\$ 81,180.26

We have included a detailed level of effort for the tasks associated with this work. The cost for any additional services beyond those detailed within this scope of work shall be established and agreed upon in writing prior to commencing the work.



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We appreciate the opportunity to continue working with you and look forward to seeing this project through to completion. Should you have any questions or require additional information, please do not hesitate to contact our Project Manager, Sandy Lasser at (281) 675-1801.

Sincerely,

A handwritten signature in black ink, reading "MR McCrary", is written over the typed name.

M.R. (Rod) McCrary, P.E., DBIA
Vice President

MRM:CLL:lf
Attachments

cc: Project file
Sandy Lasser, P.E.

City of League City Nottingham Ditch Revisions - Hydrologic & Hydraulic Analysis

Level of Effort

Item	Description / Task	Estimated Manhours										Subtotal (cost \$)	Subs (cost)	Subs (cost+8%)	Other Direct Costs	Total Fee
				Principal (hrs)	Project Mgr. (hrs)	Project Egr. (hrs)	Graduate Egr. (hrs)	Sr Tech Coord (hrs)	CADD (hrs)	Admin. (hrs)	Subtotal (hrs)					
7	Hydrologic & Hydraulic Analysis															
1	Update HEC-RAS Model to add Sheet Pile in Water Line area					2	8				10	\$ 1,164.66		\$ -		\$ 1,164.66
2	Assess Impacts and determine mitigation solutions					6	20				26	\$ 3,110.34		\$ -		\$ 3,110.34
3	Review SvsQ Revisions					2	4				6	\$ 781.01		\$ -		\$ 781.01
4	Update bank stations based on available data					1	2				3	\$ 390.50		\$ -		\$ 390.50
5	Refine model cross sections based on available data					4	12				16	\$ 1,945.67		\$ -		\$ 1,945.67
6	Prepare Letter Report					5	16				21	\$ 2,528.00		\$ -	\$ 30.00	\$ 2,558.00
7	QA/QC Model and Report			2	2	4	2				10	\$ 1,753.85		\$ -		\$ 1,753.85
8	Meetings & Coordination				4	8					12	\$ 2,301.92		\$ -	\$ 189.75	\$ 2,491.67
	Subtotal Drawings	0	0	2	6	32	64	0	0	0	104	\$ 13,975.96	\$ -	\$ -	\$ 219.75	\$ 14,195.71
	TOTAL HOURS	0	0	2	6	32	64	0	0	0	104	208				
	TOTAL COST			\$ 411.06	\$ 1,068.75	\$ 6,357.69	\$ 6,138.46	\$ -	\$ -	\$ -		\$ 13,975.96		\$ -	\$ 219.75	\$ 14,195.71
															Total	\$ 14,195.71

City of League City Nottingham Ditch Revisions - PS&E & Bidding

Level of Effort

Item No.	Description / Task	Estimated Manhours									Subtotal (cost \$)	Subs (cost)	Subs (cost+8%)	Other Direct Costs	Total Fee
				Principal (hrs)	Project Mgr. (hrs)	Project Egr. (hrs)	Graduate Egr. (hrs)	Sr Tech Coord (hrs)	CADD (hrs)	Admin. (hrs)					
3	PS&E Revisions - Final Design :														
1	Project Team Meetings			4	8						12	\$ 2,384.13	\$ -	\$ 379.50	\$ 2,763.63
2	Update Cover Sheet				2			2			4	\$ 602.88	\$ -		\$ 602.88
3	Update Construction Notes (2 sheets)				4			8			12	\$ 1,726.44	\$ -		\$ 1,726.44
4	Update Survey Control (2 Sheets)										0	\$ -	\$ -		\$ -
5	Update Typical Sections (1 Sheet)				2			6			8	\$ 1,123.56	\$ -		\$ 1,123.56
6	Add Typical Section for Slope Paving and Headwalls (1 Sheet)				4			12			16	\$ 2,247.12	\$ -		\$ 2,247.12
7	Update Sheet Layout (2 Sheets)				2			6			8	\$ 1,123.56	\$ -		\$ 1,123.56
8	Update Plan and Profile Sheets (18 Sheets)				36			52	44		132	\$ 17,456.25	\$ -		\$ 17,456.25
9	Create Plan and Profile Sheets (2 Sheets)				8			20			28	\$ 3,973.56	\$ -		\$ 3,973.56
10	Add Slope Paving Detail Sheet				6			12			18	\$ 2,589.66	\$ -		\$ 2,589.66
11	Update Miscellaneous Retaining Wall Details (2 Sheets)			4	2			6			12	\$ 2,137.50	\$ -		\$ 2,137.50
12	Update HCFCD Interceptor Structure Detail Sheets (3 Sheets)				2			4			6	\$ 863.22	\$ -		\$ 863.22
13	Update Cross Sections (10 sheets)				8			60	10		78	\$ 10,207.93	\$ -		\$ 10,207.93
14	Update Earthwork Quantities (1 Sheet)				6			16	8		30	\$ 3,932.45	\$ -		\$ 3,932.45
15	Update Storm Water PPP (2 Sheets)				4			8	4		16	\$ 2,137.50	\$ -		\$ 2,137.50
16	Update Storm Water PPP Details (1 Sheet)				2			4			6	\$ 863.22	\$ -		\$ 863.22
17	Add Geotextile stabilization Detail (1 Sheet)				4			8			12	\$ 1,726.44	\$ -		\$ 1,726.44
18	Construction Cost Estimate				6		6	10			22	\$ 2,863.70	\$ -		\$ 2,863.70
19	Project Manual (Specifications/Contract Documents)				6		6			4	16	\$ 1,890.87	\$ -		\$ 1,890.87
20	QAQC and address Comments			4	2			4	4		14	\$ 2,288.22	\$ -		\$ 2,288.22
21	Plan Approval/Signatures (City of League City)										0	\$ -	\$ -		\$ -
22	Manage, Monitor & Coordinate Project Activities to All Team Members, etc.				16						16	\$ 2,740.38	\$ -		\$ 2,740.38
23	Monthly Invoicing, Write Progress reports to Client, & Update Project Schedule				8		4				12	\$ 1,726.44	\$ -		\$ 1,726.44
	TOTAL	0	0	12	138	0	16	238	70	4	478	\$ 66,605.05	\$ -	\$ 379.50	\$ 66,984.55

City of League City Nottingham Ditch Construction Phase Services Budget - Not Included in Supplemental Request Budget

Level of Effort

Item No.	Description / Task	Estimated Manhours										Subtotal (cost \$)	Subs (cost)	Subs (cost+8%)	Other Direct Costs	Total Fee
				Principal (hrs)	Project Mgr. (hrs)	Project Egr. (hrs)	Graduate Egr. (hrs)	Sr Tech Coord (hrs)	CADD (hrs)	Admin. (hrs)	Subtotal (hrs)					
12	CONSTRUCTION PHASE SERVICES:															
1	Attend Pre-Construction Meeting				4	5					9	\$ 1,335.94		\$ -	\$ 126.50	\$ 1,462.44
2	Attend Scheduled Construction Progress Meetings				20						20	\$ 3,425.48		\$ -	\$ 316.25	\$ 3,741.73
3	Submittals (max. of 20)				20		40				60	\$ 6,987.98		\$ -		\$ 6,987.98
4	RFI's (max. of 15)				15		30				45	\$ 5,240.99		\$ -		\$ 5,240.99
5	Baseline Staking										0	\$ -	\$ -	\$ -		\$ -
6	Site Visits					8					8	\$ 1,041.35		\$ -	\$ 126.50	\$ 1,167.85
7	Field Changes				8	8					16	\$ 2,411.54		\$ -		\$ 2,411.54
8	Subst/Final Completion Walk-Thru / Recommendations				8	8					16	\$ 2,411.54		\$ -		\$ 2,411.54
9	As-Built Drawings										0	\$ -		\$ -	\$ -	\$ -
	Subtotal Phase III - Construction Phase Services	0	0	0	75	29	70	0	0	0	174	\$ 22,854.81	\$ -	\$ -	\$ 569.25	\$ 23,424.06
	TOTAL TASK 12- BASIC SERVICES HOURS			0	75	29	70	0	0	0	174	174				
	TOTAL TASK 12 - BASIC SERVICES COST			\$ -	\$ 12,845.55	\$ 3,774.88	\$ 6,234.38	\$ -	\$ -	\$ -		\$ 22,854.81	\$ -	\$ -	\$ 569.25	\$ 23,424.06

NOTES:

1. Expected submittals include: Sheet pile, sheet pile cap,slope paving concrete, headwall concrete, geotextile, hydromulch, steel to concrete sealant.