City of Lee's Summit Sanitary Sewer Modeling, Hydraulic Capacity & Design Services

Phase 1: Sanitary Sewer Study Scope and Fee

		Task Start Date	Task End Date	P. Young	S. Tomic	B. Banion	A. Bresette	R. Eisele	A. Bagwell	S. Humphreys	S. Fleckenstien	A. DeGonia	W. Neds	W. Sherman	J. Yakle	T. Green	T. Meyer	J. Jasper	S. Hadley	A. Mynatt	S. Berne	HDR Expenses	Total
				Principal	Sr. Technical Specialist/ Model QC	Report QC	Sr. Project Manager	Sr. Project Eng.	Project Eng.	Sr. Tech Specialist / Modeler	Modeler/Project Eng.	Project Eng.	Assistant Project Eng.	Sr. Technician	Survey Mgr.	Survey Crew Chief	Survey Crew	Field Supervisor I	Sr. Support Staff	Admin	Admin		
	Allowable Billing Rates per Client Contract			**250.00**	**290.00**	**210.00**	**210.00**	**200.00**	**150.00**	**210.00**	**120.00**	**125.00**	**105.00**	**125.00**	**150.00**	**105.00**	**70.00**	**95.00**	**85.00**	**75.00**	**75.00**		
	TASKS																						
	Task 1 - Project Managmeent/Administarative	**7/1/2018**	**12/31/2018**																				
1	Conduct Project Kick-off Meeting with Design Team and City Staff.			2			4	2	2														$2,040
2	Perform project phase administrative duties, including supervision and coordination of the project team, preparation and implementation of the safety plan, review of project costs and billings, preparation of invoices using Engineer's standard form, preparation of status reports, and general administrative activities.			2			8	4											8	8			$4,260
3	Conduct Project Approach and Resourse Review (PARR), Project Management Review, and Project Quality Control Review			4	2	4	2																$2,840
4	Conduct four (4) general project meetings to discuss project status, flow and sizing analysis, condition assessment, cost effective analysis, modeling options and alignment, options, coordination efforts, etc. Provide meeting minutes for each meeting held with City Staff.			2			8	4	4	4											4	$100	$4,820
	Subtotal Hours			**10**	**2**	**4**	**22**	**10**	**6**	**4**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**8**	**8**	**4**		
	Subtotal Dollars			**2500**	**580**	**840**	**4620**	**2000**	**900**	**840**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**680**	**600**	**300**	**100**	**$13,960**
	Total Task 1																						**$13,960**
	Task 2 - Collection & Review of Existing Information	**7/1/2018**	**12/31/2018**																				
1	Review City as-built information, (GIS, sewer, storm, rehabilitation, Cityworks mapping).						4	4	4	8			8										$4,760
2	Review City inspection information (sewer CCTV, manhole inspections, Cityworks maintenance records) and staff institutional knowledge of problems areas and system performance. Identify line segments recommended for system renewal improvements (short term and long term) due to condition.						4	4	8				24										$5,360
3	Review City flow meter and rainfall data and final report.						4	4	8	4													$3,680
4	Review of current available property and easement information (plats, easements, GIS, limited title reports (10 max.) included)						4					16			8							$1,500	$5,540
5	Contact utilities and obtain available utility information in the vicinity of the trunk sewer alignment (electric, water, gas, telecommunications).												16										$1,680
6	Field survey sanitary sewer manholes along the trunk sewer alignment from MH 37-001 to MH 30-124 including the parallel sewer system. Approximately 90 manholes will be included. Survey control and benchmarks within the project area will be set.														8	48	48	10				$225	$10,775
7	Perform condition assessment and evaluation of surcharge within manholes at the time of invert elevation verification.												48									$225	$5,265
8	Conduct field site visits (3 included) with the design team and City personnel and evaluate alignments with respect to sewer geometry, local, state, and federal requirements including stream setbacks, stream crossings, and wetlands review of the project alignment.						8	8	4													$150	$4,030
9	Evaluate temporary easements and potential access easements based on conditions observed in the field. The Engineer will note potential significant private property impacts and any grade-dependent facilities.						4						8	4									$2,180
10	Evaluate potential permitting issues involved with reconstruction and/or realignment of the sewer including City, FEMA, USACE, MDNR, MoDOT UPRR, and/or Jackson County.						4					8											$1,840
11	Meet with Water Utilities and Lee's Summit Development Services to determine potential future development/growth within the watershed and anticipated impact on future flow conditions.						4		4													$50	$1,490
	Subtotal Hours			**0**	**0**	**0**	**36**	**20**	**28**	**12**	**0**	**24**	**104**	**4**	**16**	**48**	**48**	**10**	**0**	**0**	**0**		
	Subtotal Dollars			**0**	**0**	**0**	**7560**	**4000**	**4200**	**2520**	**0**	**3000**	**10920**	**500**	**2400**	**5040**	**3360**	**950**	**0**	**0**	**0**	**2150**	**$46,600**
	Total Task 2																						**$46,600**

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	Allowable Billing Rates per Client Contract			**250.00**	**290.00**	**210.00**	**210.00**	**200.00**	**150.00**	**210.00**	**120.00**	**125.00**	**105.00**	**125.00**	**150.00**	**105.00**	**70.00**	**95.00**	**85.00**	**75.00**	**75.00**		
	TASKS																						
	Task 3 - Model Dev, Capacity Assmt and Alt. Analysis	7/1/2018	12/31/2018																				
1	Conduct a predesign workshop to review available sewer modeling software with City staff and compare and contrast methodology and benefits. The outcome of the workshop is to pick the platform to proceed with development of a hydraulic model for this area that can ultimately be handed off to the City at the end of the project for use by City staff.						8	8		16												$400	$7,040
2	Based on workshop results, the selected modeling software will be utilized to develop a hydraulic model of sewers 10-inch diameter and larger to analyze the service area. 8-inch sewers in the downtown area where the two future high density developments are anticipated will also be included in the model. The evaluation will include an analysis of flows for current conditions based on recent flow monitoring and comparison to projected flows based on the Lee's Summit Design Criteria. Models for the current and future loadings will be created.				4		4	4		40	60												$18,400
3	System performance and capacity constraints will be evaluated for current conditions and future capacity conditions. Design criteria peak flows will be compared to flow conditions observed during recent flow monitoring. Design scenarios considering reductions in I&I within the watershed will be analyzed to determine the impact on peak wet weather flow.						4	4	24	16													$8,600
4	Conduct a flow and size analysis of the trunk sewer with and without I/I removal. Flow and size analysis will be evaluated with public and private I/I removal, public removal only, and then private removal only. Flows from future high density residential development will be included. Models including the proposed capacity improvements will be created for each scenario. Considerations for peak flow storage within the watershed will be analyzed to determine the effect on trunk sewer sizing. Up to three locations for potential peak flow storage will be reviewed.						8	8		8	16												$6,880
5	Evaluate the proposed improvements in comparison to the available inspection data and system renewal needs to inform the extent and scope of recommended capacity improvements. Incorporate system renewal improvements into the recommended improvement project where appropriate.							8	8			8											$3,800
	Subtotal Hours			**0**	**4**	**0**	**24**	**32**	**32**	**80**	**76**	**8**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**		
	Subtotal Dollars			**0**	**1160**	**0**	**5040**	**6400**	**4800**	**16800**	**9120**	**1000**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**400**	**$44,720**
	Total Task 3																						**$44,720**
	Task 4 - Prelmininary Design Memorandum	7/1/2018	12/31/2018																				
1	Summarize flow scenarios considered and recommended design peak flows.						4	4	8														$2,840
2	Establish sizing and design conditions for each gravity line segment based on recommended alignments and preliminary slopes.								16		8												$3,360
3	Discuss potential insitu repair technologies to existing manholes and sewers to minimize open cut sewer replacement.						6	4															$2,060
4	Prepare preliminary plan and profile sheets utilizing Lee's Summit GIS data and aerial photography as a background. Develop preliminary vertical designs of the sewer using a ground surface profile developed from GIS mapping. Identify preliminary manhole and locations. To the greatest extent possible, the Engineer will show existing facilities (utilities and any known on-site sewage disposal systems) on the drawings. The Engineer will show the proposed permanent and temporary easements and property owner information on the plan and profile sheets.											24		80									$13,000
5	Summarize permitting and property concerns for the recommend improvements.						4		4														$1,440
6	Develop conceptual cost estimates of the removal of typical residential inflow sources from the sewer system including foundation drains, sump pumps, downspouts, and stairwell drains. These typical costs will be extrapolated based on the total number of residential properties and assumed number of illicit connections based on previous priority basin studies.			1			4		8														$2,290
7	Prepare conceptual cost estimates for the recommended improvements to the public sewer system. These overall cost estimates will be compared to per capita costs for removal of private I/I.			1			4	4	8			8											$4,090

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	TASKS																						
8	Prepare Draft and Final "Basis of Design" memorandum documenting modeling, along with gravity sewer and peak storage pre-design activities. The report will be prepared and provided to the City in hard and electronic copies. The system modeling will also be provided electronically to the City.			2		6	8	4	24			24										$150	$10,990
9	Conduct meeting to review preliminary plan and profile of alignments with City staff.			2			4	4	4														$2,740
10	Conduct a presentation to the Public Works committee on the findings of the Preliminary Design Memorandum.			2			4	4						8								$100	$3,240
	Subtotal Hours			**8**	**0**	**6**	**38**	**24**	**72**	**0**	**8**	**56**	**0**	**88**	**0**	**0**	**0**	**0**	**0**	**0**	**0**		
	Subtotal Dollars			**2000**	**0**	**1260**	**7980**	**4800**	**10800**	**0**	**960**	**7000**	**0**	**11000**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**250**	**$46,050**
	Total Task 4																						**$46,050**
	Total Hours			**18**	**6**	**10**	**120**	**86**	**138**	**96**	**84**	**88**	**104**	**92**	**16**	**48**	**48**	**10**	**8**	**8**	**4**		**984**
	Total Billing Amount			**$4,500**	**$1,740**	**$2,100**	**$25,200**	**$17,200**	**$20,700**	**$20,160**	**$10,080**	**$11,000**	**$10,920**	**$11,500**	**$2,400**	**$5,040**	**$3,360**	**$950**	**$680**	**$600**	**$300**	**$2,900**	**$151,330**

Estimated Project Fee **$151,330**