

Attachment A

Scope of Work

Settlers Park and Sugar Lakes Drainage Assessment

The objective of this study is to identify drainage system deficiencies and to evaluate and prioritize potential improvement alternatives within the study area. Drainage system performance will be assessed according to current City drainage criteria. The study area includes the Settlers Park, Chimneystone, and Austin Park subdivisions, as well as the Sugar Lakes subdivision adjacent to Oyster Creek, as shown in Exhibit 1.

BASIC SERVICES: Freese and Nichols, Inc. (FNI) (Consultant) will complete the following tasks as part of the Settlers Park and Sugar Lakes Drainage Assessment for the City of Sugar Land (City) for a **total lump sum fee of \$170,700**.

TASK 1. Data Collection and Evaluation \$35,700

The Consultant will utilize the following data:

- Data provided by the City:
 - Plans, as available, for existing storm drain systems
 - Rainfall data for 2016 Tax Day Flood
 - HWM collected as part of Harvey drainage evaluation
 - GIS Data:
 - Storm drain system features within Sugar Lakes area
 - Existing land use
 - Tracts/Parcels
 - City survey benchmarks
 - Recent aerial photos
- Consultant to collect:
 - Stream gauge data for historic storm events
- Survey to be collected by sub-consultant:
 - Culvert crossings at ditch along LID 2 south levee
 - Trunkline along Settlers Way south of Austin Pkwy.
 - Trunkline along Commonwealth between Austin Pkwy. and LJ Pkwy.
 - Culvert under Austin Pkwy at east end of LID2
 - Spot elevations to validate datum adjustment for storm drain system elevations (All elevations will be adjusted to NAVD88, 2001 Adj.)
 - Control structures for Sugar Lakes system (2 structures)

Data will be evaluated and organized as necessary to be utilized in subsequent tasks.

Consultant will complete a field visit to verify current conditions. The information collected during the field visit (photographs, measurements) will aid in the development of the hydraulic models.

TASK 2. Drainage Assessment \$49,100

For the Settlers Park, Chimneystone, and Austin Park subdivisions, the LID 2 InfoWorks ICM model developed as part of the Harvey drainage evaluation will be used as a starting point. The following updates will be implemented:

- ICM model updated to version 8
- Ground model updated from 2005 to 2014 Lidar
- Storm drain system elevations adjusted, if necessary, according to validation of previous datum adjustment
- Additional survey/plans incorporated

For the Sugar Lakes subdivision, a new InfoWorks ICM model will be developed. The ground model will be developed using 2014 Lidar. Storm drain system features and attributes will be incorporated according to available City GIS data and plans. Survey information will be utilized for control structures for the inter-connected lake system. Tailwater conditions on Oyster Creek will be determined from the Ditch H Restudy HEC-RAS model.

Hydrology will be simulated using rain-on-mesh analysis. Infiltration parameters will be implemented for pervious areas based on soil type, as determined according to the Natural Resource Conservation Service (NRCS) Soil Survey Geographic Database (SSURGO). Storm events to be evaluated will include the 2-, 5-, 10-, 25-, 50-, 100-, and 500-yr design storm events as well as the 2015 Memorial Day, 2016 Tax Day, and 2017 Harvey historical storm events. Rainfall for the historical storm events will be based on gauge-adjusted radar rainfall, and tailwater conditions on Ditch H will be defined from the Ditch H HEC-RAS model.

Drainage system performance will be evaluated according to current City criteria. Deficiencies and potential causes of flooding will be summarized for the analyzed storm events. Results will be documented in a report, presented at a meeting with the City, and used to guide the development of alternatives.

TASK 3. Alternatives \$40,900

Improvement alternatives will be identified in a meeting with City staff. A conceptual level alternative that meets current drainage criteria will be developed for each drainage system that doesn't meet current drainage criteria. Each alternative will be evaluated for the three historical events, and a comparison against the performance of the existing infrastructure will be completed. An opinion of probable construction cost will be developed for each alternative.

TASK 4. Deliverables \$22,300

Deliverables include GIS datasets, models, and a report.

GIS Datasets:

- Field survey used to build Hydraulic models
- Georeferenced photographs taken during field visit
- Results depth rasters
- Existing Storm Drain network
- Proposed Alternatives

Models

- Settlers Park model, ICM 8
- Sugar Lakes model, ICM 8

A report will document the data collected, drainage assessment results, alternatives, and prioritization. Results will include inundation maps, exhibits with the alternatives, and opinion of probable construction cost (OPCC) estimates. FNI will respond to one round of review comments from the City and make necessary updates to the report.

TASK 5. Project Management \$22,700

Consultant will provide Project Management services including project coordination and communications with the City and monthly status reporting.

Conduct up to a total of three (3) Team meetings with City staff, as well as monthly coordination meetings with City staff and other consultants. The three Team meetings are anticipated as follows:

1. Kickoff and data collection meeting
2. Present drainage assessment results and identify alternatives
3. Present results for alternatives

It is anticipated that the technical tasks will be completed within four months from receiving Notice to Proceed.

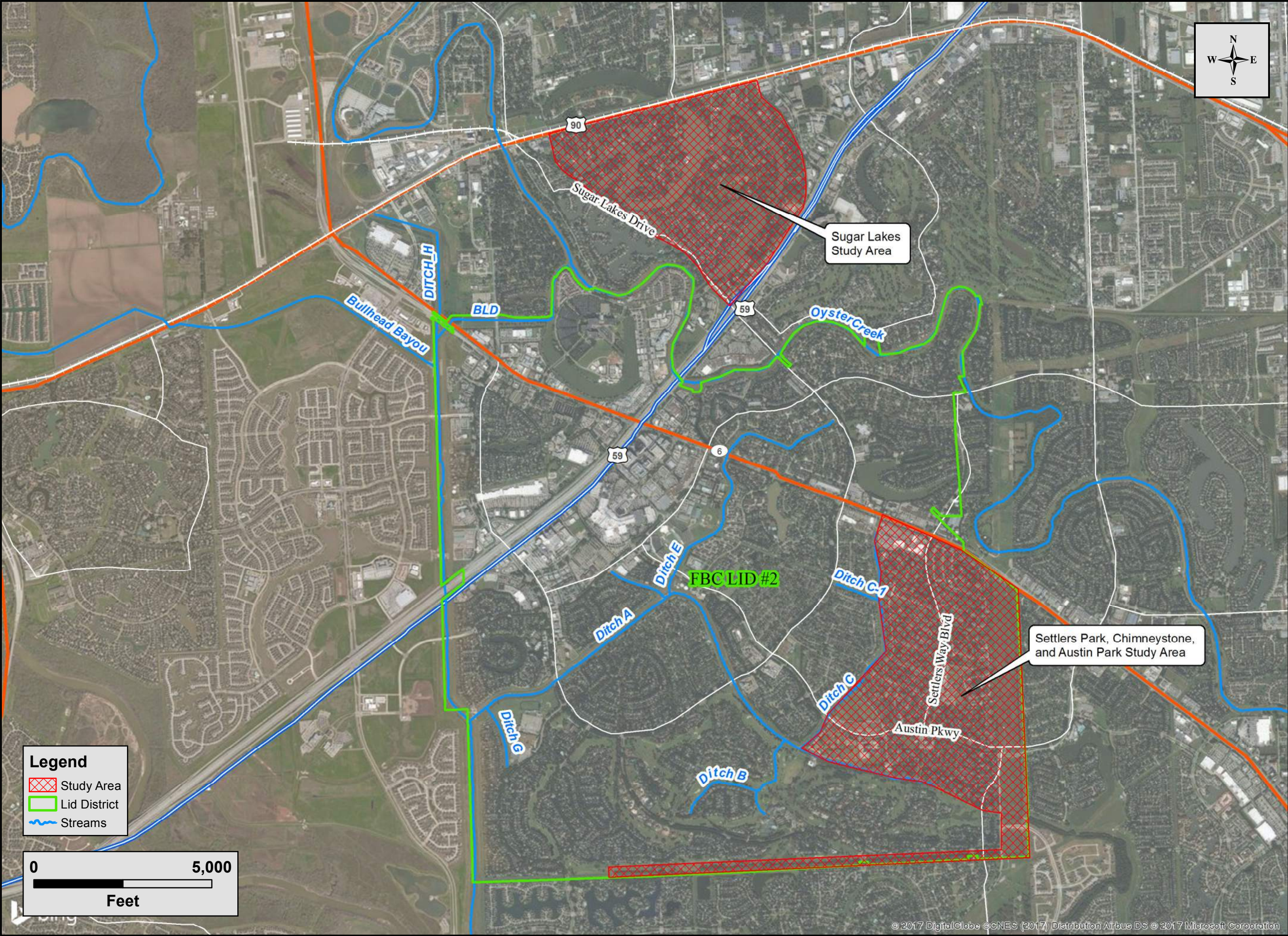


EXHIBIT 1

Verbal Scale: 1" = 2,500'

Absolute Scale: 1 : 30,000

FN Job #:


File Path: H:\STORMWATER\FINAL_EXHIBITS\Exhibit1 Study Area.mxd

Study Area

Settlers Park & Sugar Lakes

Drainage Assessment

City of Sugar Land, Texas

**FREESE
NICHOLS**
10497 Town And Country Way, Suite 600
Houston, Texas 77024
P: (713) 600-6800 F: (713) 600-6801

Date: November, 2017

Designed: MAP

City of Sugar Land
Settlers Park and Sugar Lakes Drainage Assessment
11/16/2017
Detailed Cost Breakdown

Project Fee Summary

Basic Services	170,654
Special Services	-
Total Project	170,654

Basic Services

		Employee	Michael Reedy	Hector Olmos	Mark Pauls	Shannon Simmons	Jeremy Dixon	Daniel Lindner	Kristina Isaac	Ron Bavarian	Rick Lane			Total Hours	Total Labor Effort	Total Expense Effort	Total Sub Effort	Total Effort
Phase	Task	Project Role	PIC	PM	PE	EIT	QC	GIS	OA									
1	1	Data collection & evaluation		4	8			4						16	\$ 2,816	\$ 136	\$ 25,575	\$ 28,527
1	2	Field visit		6	8	8		4						26	\$ 4,391	\$ 221	\$ -	\$ 4,612
1	3	Field survey coordination		4	8			2						14	\$ 2,492	\$ 119	\$ -	\$ 2,611
2	1	Hydraulic modeling, Settlers Park		8	48	24		8						88	\$ 14,244	\$ 748	\$ -	\$ 14,992
2	2	Hydraulic modeling, Sugar Lakes		16	52	52		8						128	\$ 20,621	\$ 1,088	\$ -	\$ 21,709
2	3	Hydraulic modeling, QC					8							8	\$ 1,298	\$ 68	\$ -	\$ 1,366
2	4	Results analysis		8	16	16		24						64	\$ 10,508	\$ 544	\$ -	\$ 11,052
3	1	Alternatives modeling		16	56	56								128	\$ 20,542	\$ 1,088	\$ -	\$ 21,630
3	2	Cost estimates		4	16					12	48			80	\$ 16,894	\$ 680	\$ -	\$ 17,574
3	3	Alternatives, QC					8							8	\$ 1,298	\$ 357	\$ -	\$ 1,655
4	1	Deliverables			60	20		40						120	\$ 19,074	\$ 1,020	\$ -	\$ 20,094
4	2	Deliverables, QC	2	8										10	\$ 2,103	\$ 85	\$ -	\$ 2,188
5	1	Project management	4	30	12				4					50	\$ 9,811	\$ 425	\$ -	\$ 10,236
5	2	Meetings/coordination	8	24	32									64	\$ 11,864	\$ 544	\$ -	\$ 12,408
Total Basic Services Hours			14	128	316	176	16	90	4	12	48	-	-	804	\$ 137,956	\$ 7,123	\$ 25,575	\$ 170,654

Phase	Task	Expenses	Tech Charge	Miles	Meals	Hotel	B&W (sheet)	Color (sheet)	Binding (each)	Lg Format - Bond - B&W (sq. ft.)	Lg Format - Glossy/Mylar - B&W (sq. ft.)	Other	Other	Total Exp Effort
1	1	Data collection & evaluation	16											\$ 136
1	2	Field visit	26											\$ 221
1	3	Field survey coordination	14											\$ 119
2	1	Hydraulic modeling, Settlers Park	88											\$ 748
2	2	Hydraulic modeling, Sugar Lakes	128											\$ 1,088
2	3	Hydraulic modeling, QC	8											\$ 68
2	4	Results analysis	64											\$ 544
3	1	Alternatives modeling	128											\$ 1,088
3	2	Cost estimates	80											\$ 680
3	3	Alternatives, QC	8	540										\$ 357
Total Basic Services Items			804	540	-	-	-	-	-	-	-	-	-	
Total Basic Services Expenses Effort			\$ 6,834	\$ 289	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 7,123

Phase	Task	Subconsultants	GA	[Name 2]	[Name 3]	[Name 4]								Total Sub Effort
1	1	Data collection & evaluation	23,250											\$ 25,575
1	2	Field visit												\$ -
1	3	Field survey coordination												\$ -
2	1	Hydraulic modeling, Settlers Park												\$ -
2	2	Hydraulic modeling, Sugar Lakes												\$ -
2	3	Hydraulic modeling, QC												\$ -
2	4	Results analysis												\$ -
3	1	Alternatives modeling												\$ -
3	2	Cost estimates												\$ -
3	3	Alternatives, QC												\$ -
Total Basic Services Subconsultants Cost			\$ 23,250	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
Total Basic Services Subconsultants Effort			\$ 25,575	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 25,575

City of Sugar Land
Settlers Park and Sugar Lakes Drainage Assessment
11/16/2017
Detailed Cost Breakdown

Project Fee Summary

Basic Services	170,654
Special Services	-
Total Project	170,654

Special Services

Phase	Task	Employee	Michael Reedy	Hector Olmos	Mark Pauls	Shannon Simmons	Jeremy Dixon	Daniel Lindner	Kristina Isaac	Ron Bavarian	Rick Lane			Total Hours	Total Labor Effort	Total Expense Effort	Total Sub Effort	Total Effort
		Project Role	PIC	PM	PE	EIT	QC	GIS	OA									
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Total Special Services Hours			-	-	-	-	-	-	-	-	-	-	-	-	\$ -	\$ -	\$ -	\$ -

Phase	Task	Expenses	Tech Charge	Miles	Meals	Hotel	B&W (sheet)	Color (sheet)	Binding (each)	Lg Format - Bond - B&W (sq. ft.)	Lg Format - Glossy/Mylar - B&W (sq. ft.)	Other	Other	Total Exp Effort
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Total Special Services Items			-	-	-	-	-	-	-	-	-	-	-	
Total Special Services Expenses Effort			\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

Phase	Task	Subconsultants	GA	[Name 2]	[Name 3]	[Name 4]								Total Sub Effort
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Total Special Services Subconsultants Cost			-	-	-	-	-	-	-	-	-	-	-	
Total Special Services Subconsultants Effort			\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -