PRINCIPAL Engineering, Inc.

1011 N Causeway Blvd, Suite 19 ♦ Mandeville, Louisiana 70471 ♦ Phone: 985.624.5001♦ Fax: 985.624.5303

June 11th, 2020

Attn: Mr. Miles Bingham, Director
St. Charles Parish Government
Department of Public Works
100 River Oaks Drive
Destrehan, Louisiana 70047

RE: Proposal for Engineering Services
East Bank Master Drainage Plan

Dear Mr. Bingham,

Principal Engineering, Inc. (Principal) is pleased to submit a fee proposal to perform professional engineering services for the East Bank Master Drainage Plan. For the 13 basins defined on the East Bank, the scope of work generally includes collection of existing drainage information and study, creation and calibration of an existing condition hydrologic and hydraulic (H&H) model in EPA's SWMM for storms of varied rainfall return periods, development of drainage project alternatives to improve drainage, and the preparation of a comprehensive report with probable construction costs, and implementation recommendations. GIS and open source information will be used for model creation. If required, survey will be under separate contract. In the Montz and Ormond basins, existing models will be reviewed and adopted for project alternative modeling.

The following scopes are based on instructions issued in the meeting with St. Charles Parish Dept. of Public Works on May 21st, 2020; and on follow-up correspondence. Unless otherwise noted, the project alternatives will be devised to:

- Avoid structure flooding during the 100-yr rainfall event
- Avoid street flooding during the 25-yr rainfall event

The reduction in 100-yr frequency water stages to avoid structure flooding is primarily accomplished by improvements to major canals, major drainage culverts, detention areas, and/or pumping stations. The reduction in water stages to avoid street flooding is accomplished by lowering stages in the major drainage features to improve outfall conditions for interior drainage features, and if necessary, improvements to roadside ditches, subsurface piping, inlets, and the smaller network of pipes and ditches. Often, major features and small interior features have interdependent effects on each other.

Montz Basin Scope

The 2019 Montz H&H model was provided by the Parish, and will be adopted for this effort. Cursory review of 2019 work shows that it hydraulically represents the major drainage canals, approximates the contributing flows from the basin with hydrologic parameters, and does not include interior modeling or overbank topography. The 10-yr event was modeled. Current scope is limited to review of the 2019 model, and update to project alternatives. See also attached task and sub-task exhibit with man-hour estimates.

Deliverables include:

- Memorandum of Evaluation. Description of the 2019 model framework, capabilities, limitations, and the results of a quality review for obvious errors. Qualitative discussion of the 2019 improvement alternatives.
- Project Alternative Models. Within the existing 2019 model, alter the 2019 project alternatives or generate new alternatives in consultation with the Parish, as appropriate for the model framework. Two (2) improvement alternative schemes are included.
- Project Alternative Memorandum. Written narrative describing the project alternatives, costs, and location map identifying alternatives. Complete model outputs will be included as appendices.

Exclusions from scope are:

- Topographic Survey
- Expansion of 2019 model to add overbank topography, open space storage, or interior drainage features.
- Re-calibration of the model hydrology and hydraulics.
- Overland inundation mapping.
- Structure flooding prediction.

Norco and New Sarpy Basins

H&H models of the major drainage features will be developed from the Parish GIS, LiDAR, and other open source data sources. Review of existing information, existing condition modeling, project improvement modeling, and a comprehensive report are included; comprising a complete drainage modeling study effort. See also attached task and sub-task exhibit with man-hour estimates.

Deliverables include:

- Existing Condition Model. Model the major drainage features in the basin area to include pump stations, canals, ditches, and significant culverts. Model 10-yr, 25-yr, 50-yr, and 100-yr return period rainfall events; and calibrate to available measurements.
- Project Alternative Models. Generate project alternatives in consultation with the Parish. Two (2) improvement alternative schemes are included.

- Comprehensive Report. Written narrative describing the technical approach, data incorporated, modeling methodology, project alternatives, costs, inundation maps, and supporting graphics. Complete model outputs will be included as appendices.

Exclusions from scope are:

- Topographic Survey
- Detailed modeling of interior drainage features.

Ormond Basin

The 2019 Ormond H&H model was provided by the Parish, and will be adopted for this effort. Cursory review of 2019 work shows that it included only 863 acres of the total 1440 acres in the Ormond basin, and the model hydraulically represents the major drainage canals, approximates the contributing flows from the basin with hydrologic parameters, and does not include detailed interior modeling. Topography is included with a digital terrain model surface, and the model predicts inundation depths. The 10-yr event was modeled. Current scope includes a) review of the 2019 model, modification of features identified by the Parish; and b) expansion of the model to include the entire Ormond basin, and new project alternative modeling. See also attached task and sub-task exhibit with man-hour estimates.

Deliverables include:

- Memorandum of Evaluation. Summary of 2019 model framework, capabilities, limitations, and the results of a quality review for errors. Qualitative discussion of the 2019 improvement alternatives.
- Expanded Existing Condition Model. Expand the modeled area to include the entire 1440 acre Ormond basin at the same level of detail as the 2019 model. Update hydrology to include 25-yr, 50-yr and 100-yr return period rainfall events.
- Project Alternative Models. With the expanded model, alter the 2019 project alternatives and/or generate new alternatives in consultation with the Parish. Two (2) improvement alternative schemes are included.
- Comprehensive Report. Written narrative describing the technical approach, data incorporated, modeling methodology, project alternatives, costs, inundation maps, and supporting graphics. Complete model outputs will be included as appendices.

Exclusions from scope are:

- Topographic Survey
- Detailed modeling of interior drainage features.

Fee Summary

Each of the thirteen (13) basins located in the East Bank of St. Charles Parish are shown below. Generally, the man-hours to perform modeling were estimated from the total areas and developed areas of each basin (incorporating 2019 models in Montz and Ormond). Developed area requires more intense model architecture, and therefore weights the effort more than undeveloped area. Based on the study criteria discussed with the Parish and experience with past large-scale H&H modeling efforts, we have prepared task & sub-task lists, including employee classifications anticipated to be assigned, and estimated man-hours by classification. Fees will be invoiced according to the number of hours expended by each classification of employee, according to the attached rate schedule, and direct expenses incurred.

No.	Basin	Area (AC.)	Developed Area (AC.)	Proposed Fee
1	**Montz**	1635	240	$32,360.00
2	**Norco**	800	430	$171,640.00
3	**New Sarpy**	690	430	$163,500.00
4	**Ormond**	1420	1420	-
	a. Evaluate/Revise Ex. Model	863	863	$110,010.00
	b. Model Remaining Basin	557	557	$230,000.00
5	**Destrehan Plantation**	205	Sparse	To Be Determined
6	**Plantation Business Ctr.**	110	Sparse	To Be Determined
7	**Destrehan West**	220	50	To Be Determined
8	**Destrehan East**	310	40	To Be Determined
9	**St. Rose**	450	135	To Be Determined
10	**Dianne Place**	220	90	To Be Determined
11	**Bar None**	70	70	To Be Determined
12	**Turtle Pond**	700	200	To Be Determined
13	**Almedia**	475	80	To Be Determined

We look forward to discussing the scope, tasks and fees proposed and we truly appreciate the opportunity to work with St. Charles Parish on these important master drainage plan projects. If you have any questions regarding this proposal, please do not hesitate to contact our office.

Sincerely,
PRINCIPAL *Engineering, Inc.*

Andre C. Monnot, P.E.
Executive Vice President

HOURLY RATES

BILLABLE RATES PER CLASSIFICATION

CLASSIFICATION	BILLABLE RATE
Principal Engineer (Licensed PE)	$200.00
Engineer IV (Senior - Licensed PE)	$185.00
Engineer III (Mid - Licensed PE)	$160.00
Engineer II (Junior - Licensed PE)	$140.00
Engineer I (Graduate BS/MS Engineer or EI)	$115.00
Senior Architect (Licensed Architect)	$155.00
Project Architect (Licensed Architect)	$140.00
Senior Engineering Tech (AS or Equiv.)	$115.00
CAD Technician III	$95.00
CAD Technician II	$80.00
CAD Technician I	$65.00
Resident Inspector	$70.00
Office/Business Manager	$80.00
Clerical/Administrative	$55.00
Direct Expenses	Exact Amount
Mileage	$0.55/mile

St. Charles Parish Government

Fee Proposal

East Bank Master Drainage Plan-***Montz Basin***

Submitted By: PRINCIPAL Engineering, Inc.

Expected Personnel Classification, Billable Rate & Man-Hour Estimate							
	Classification:	**PRINCIPAL**	**PROJECT MANAGER**	**PROJECT ENGINEER**	**TECHNICIAN**	**OFFICE MANAGER**	**Per Task**
	Rate:	**$200.00**	**$160.00**	**$140.00**	**$95.00**	**$60.00**	
TASK	**DESCRIPTION**	**Man-Hours**					
1.0	**Preliminary Data Gathering and Analysis**						
1.1	Assemble/Review Parish-Provided & Open Source Data	1	2	24	8	-	35
1.2	Site Visits	-	4	8	-	-	12
1.3	Analyze Existing Models for Relevance and Accuracy	1	16	32	-	-	49
	Sub-Total Task 1.0	**2**	**22**	**64**	**8**	**0**	**96**
		$400.00	**$3,520.00**	**$8,960.00**	**$760.00**	**$0.00**	**$13,640.00**
2.0	**Survey**						
2.1	Topographic Survey and Mapping	-	-	-	-	-	0
	Sub-Total Task 2.0	**0**	**0**	**0**	**0**	**0**	**0**
		$0.00	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**
3.0	**Model Building and Reports**						
3.1	Delineate Watersheds and Determine Boundary Conditions	-				-	0
3.2	Develop Existing Conditions Model				-	-	0
3.3	Develop Existing Conditions Model (Overland Inundation)				-	-	0
3.4	Calibrate Model						0
a.	10 Year Event	-			-	-	0
b.	25 Year Event	-			-	-	0
c.	50 Year Event	-			-	-	0
d.	100 Year Event	-			-	-	0
3.5	Develop Unimproved Future Conditions Model				-	-	0
3.6	Establish Drainage Design Criteria				-	-	0
3.7	Develop & Model Improvement Projects	1	12	32	-	-	45
3.8	Develop Improvement Model (Overland Inundation)				-		0
3.9	Project Preliminary Cost Estimates	0.5	8	12	4	-	24.5
3.10	Prepare Comprehensive Report	1	12	16	24	-	53
	Sub-Total Task 3.0	**2.5**	**32**	**60**	**28**	**0**	**122.5**
		$500.00	**$5,120.00**	**$8,400.00**	**$2,660.00**	**$0.00**	**$16,680.00**
4.0	**Project Status Reports**						
4.1	Prepare Status Report with Monthly Invoices	-	4	2	-	2	8
	Sub-Total Task 4.0	**0**	**2**	**1**	**0**	**1**	**4**
		$0.00	**$320.00**	**$140.00**	**$0.00**	**$60.00**	**$520.00**
5.0	**Meetings**						
5.1	Meetings (estimated 4)		6	4		-	10
	Sub-Total Task 5.0	**0**	**6**	**4**	**0**	**0**	**10**
		$0.00	**$960.00**	**$560.00**	**$0.00**	**$0.00**	**$1,520.00**
	Total Man-Hours Per Classification:	**4.5**	**62**	**129**	**36**	**1**	**232.5**
	Total Fee:	**$900.00**	**$9,920.00**	**$18,060.00**	**$3,420.00**	**$60.00**	**$32,360.00**

St. Charles Parish Government

Fee Proposal

East Bank Master Drainage Plan- ***Norco Basin***

Submitted By: PRINCIPAL Engineering, Inc.

Expected Personnel Classification, Billable Rate & Man-Hour Estimate							
	Classification:	**PRINCIPAL**	**PROJECT MANAGER**	**PROJECT ENGINEER**	**TECHNICIAN**	**OFFICE MANAGER**	**Per Task**
	Rate:	**$200.00**	**$160.00**	**$140.00**	**$95.00**	**$60.00**	
TASK	**DESCRIPTION**	**Man-Hours**					
1.0	**Preliminary Data Gathering and Analysis**						
1.1	Assemble/Review Parish-Provided & Open Source Data	2	4	48	20	-	74
1.2	Site Visits for Orientation	-	3	12	-	-	15
1.3	Analyze Data for Relevance and Accuracy	2	20	60	-	-	82
	Sub-Total Task 1.0	**4**	**27**	**120**	**20**	**0**	**171**
		$800.00	**$4,320.00**	**$16,800.00**	**$1,900.00**	**$0.00**	**$23,820.00**
2.0	**Survey**						
2.1	Topographic Survey and Mapping	-	-	-	-	-	0
2.2	Survey Coordination & Accuracy Verification	-	-	-	-	-	0
	Sub-Total Task 2.0	**0**	**0**	**0**	**0**	**0**	**0**
		$0.00	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**
3.0	**Model Building and Reports**						
3.1	Delineate Watersheds and Determine Boundary Conditions	-	4	24	40	-	68
3.2	Develop Existing Conditions Model	2	30	174	-	-	206
3.3	Develop Existing Conditions Model (Overland Inundation)	2	37	94	-	-	133
3.4	Calibrate Model						0
a.	10 Year Event	-	4	30	-	-	34
b.	25 Year Event	-	2	12	-	-	14
c.	50 Year Event	-	2	12	-	-	14
d.	100 Year Event	-	2	12	-	-	14
3.5	Develop Unimproved Future Conditions Model	2	30	62	-	-	94
3.6	Establish Drainage Design Criteria	2	3	12	-	-	17
3.7	Develop & Model Improvement Projects	2	20	118	-	-	140
3.8	Develop Improvement Model (Overland Inundation)	2	16	62	-	-	80
3.9	Project Preliminary Cost Estimates	1	12	32	12	-	57
3.10	Prepare Comprehensive Report	3	62	25	46	-	136
	Sub-Total Task 3.0	**16**	**224**	**669**	**98**	**0**	**1007**
		$3,200.00	**$35,840.00**	**$93,660.00**	**$9,310.00**	**$0.00**	**$142,010.00**
4.0	**Project Status Reports**						
4.1	Prepare Status Report with Monthly Invoices	-	5	2	-	2	9
	Sub-Total Task 4.0	**0**	**5**	**2**	**0**	**2**	**9**
		$0.00	**$800.00**	**$280.00**	**$0.00**	**$120.00**	**$1,200.00**
5.0	**Meetings**						
5.1	Meetings (estimated 8)	2	14	10	6	-	32
	Sub-Total Task 5.0	**2**	**14**	**10**	**6**	**0**	**32**
		$400.00	**$2,240.00**	**$1,400.00**	**$570.00**	**$0.00**	**$4,610.00**
	Total Man-Hours Per Classification:	**22**	**270**	**801**	**124**	**2**	**1219**
	Total Fee:	**$4,400.00**	**$43,200.00**	**$112,140.00**	**$11,780.00**	**$120.00**	**$171,640.00**

St. Charles Parish Government

Fee Proposal

East Bank Master Drainage Plan- ***New Sarpy Basin***

Submitted By: PRINCIPAL Engineering, Inc.

Expected Personnel Classification, Billable Rate & Man-Hour Estimate							
	Classification:	**PRINCIPAL**	**PROJECT MANAGER**	**PROJECT ENGINEER**	**TECHNICIAN**	**OFFICE MANAGER**	**Per Task**
	Rate:	**$200.00**	**$160.00**	**$140.00**	**$95.00**	**$60.00**	
TASK	**DESCRIPTION**	**Man-Hours**					
1.0	**Preliminary Data Gathering and Analysis**						
1.1	Assemble/Review Parish-Provided & Open Source Data	2	4	48	20	-	74
1.2	Site Visits for Orientation	-	3	12	-	-	15
1.3	Analyze Data for Relevance and Accuracy	2	20	60	-	-	82
	Sub-Total Task 1.0	**4**	**27**	**120**	**20**	**0**	**171**
		$800.00	**$4,320.00**	**$16,800.00**	**$1,900.00**	**$0.00**	**$23,820.00**
2.0	**Survey**						
2.1	Topographic Survey and Mapping	-	-	-	-	-	0
2.2	Survey Coordination & Accuracy Verification	-	-	-	-	-	0
	Sub-Total Task 2.0	**0**	**0**	**0**	**0**	**0**	**0**
		$0.00	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**
3.0	**Model Building and Reports**						
3.1	Delineate Watersheds and Determine Boundary Conditions	-	4	24	40	-	68
3.2	Develop Existing Conditions Model	2	24	160	-	-	186
3.3	Develop Existing Conditions Model (Overland Inundation)	2	30	84	-	-	116
3.4	Calibrate Model						0
a.	10 Year Event	-	4	28	-	-	32
b.	25 Year Event	-	2	12	-	-	14
c.	50 Year Event	-	2	12	-	-	14
d.	100 Year Event	-	2	12	-	-	14
3.5	Develop Unimproved Future Conditions Model	2	24	52	-	-	78
3.6	Establish Drainage Design Criteria	2	3	12	-	-	17
3.7	Develop & Model Improvement Projects	2	18	100	-	-	120
3.8	Develop Improvement Model (Overland Inundation)	2	16	60	-	-	78
3.9	Project Preliminary Cost Estimates	1	12	30	20	-	63
3.10	Prepare Comprehensive Report	3	60	24	78	-	165
	Sub-Total Task 3.0	**16**	**201**	**610**	**138**	**0**	**965**
		$3,200.00	**$32,160.00**	**$85,400.00**	**$13,110.00**	**$0.00**	**$133,870.00**
4.0	**Project Status Reports**						
4.1	Prepare Status Report with Monthly Invoices	-	5	2	-	2	9
	Sub-Total Task 4.0	**0**	**5**	**2**	**0**	**2**	**9**
		$0.00	**$800.00**	**$280.00**	**$0.00**	**$120.00**	**$1,200.00**
5.0	**Meetings**						
5.1	Meetings (estimated 8)	2	14	10	6	-	32
	Sub-Total Task 5.0	**2**	**14**	**10**	**6**	**0**	**32**
		$400.00	**$2,240.00**	**$1,400.00**	**$570.00**	**$0.00**	**$4,610.00**
	Total Man-Hours Per Classification:	**22**	**247**	**742**	**164**	**2**	**1177**
	Total Fee:	**$4,400.00**	**$39,520.00**	**$103,880.00**	**$15,580.00**	**$120.00**	**$163,500.00**

St. Charles Parish Government

Fee Proposal

East Bank Master Drainage Plan- ***Ormond Basin***

Submitted By: PRINCIPAL Engineering, Inc.

Expected Personnel Classification, Billable Rate & Man-Hour Estimate							
	Classification:	**PRINCIPAL**	**PROJECT MANAGER**	**PROJECT ENGINEER**	**TECHNICIAN**	**OFFICE MANAGER**	**Per Task**
	Rate:	**$200.00**	**$160.00**	**$140.00**	**$95.00**	**$60.00**	
TASK	**DESCRIPTION**	**Man-Hours**					
1.0	**Preliminary Data Gathering and Analysis**						
1.1	Assemble/Review Parish-Provided & Open Source Data	3	18	120	100	-	241
1.2	Site Visits for Orientation	-	14	56	-	-	70
1.3	Analyze Existing Models for Relevance and Accuracy	3	82	270	-	-	355
	Sub-Total Task 1.0	**6**	**114**	**446**	**100**	**0**	**666**
		$1,200.00	**$18,240.00**	**$62,440.00**	**$9,500.00**	**$0.00**	**$91,380.00**
2.0	**Survey**						
2.1	Topographic Survey and Mapping	-	-	-	-	-	0
2.2	Survey Coordination & Accuracy Verification	-	-	-	-	-	0
	Sub-Total Task 2.0	**0**	**0**	**0**	**0**	**0**	**0**
		$0.00	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**
3.0	**Model Building and Reports**						
3.1	Delineate Watersheds and Determine Boundary Conditions	-	18	80	100	-	198
3.2	Develop Existing Conditions Model	1	86	240	-	-	327
3.3	Develop Existing Conditions Model (Overland Inundation)	1	52	100	-	-	153
3.4	Calibrate Model						0
a.	10 Year Event	-	4	34	-	-	38
b.	25 Year Event	-	1	12	-	-	13
c.	50 Year Event	-	1	12	-	-	13
d.	100 Year Event	-	1	12	-	-	13
3.5	Develop Unimproved Future Conditions Model	2	34	68	-	-	104
3.6	Establish Drainage Design Criteria	2	4	14	-	-	20
3.7	Develop & Model Improvement Projects	2	68	190	-	-	260
3.8	Develop Improvement Model (Overland Inundation)	1	52	190	-	-	243
3.9	Project Preliminary Cost Estimates	1	20	50	20	-	91
3.10	Prepare Comprehensive Report	3	100	46	90	-	239
	Sub-Total Task 3.0	**13**	**441**	**1048**	**210**	**0**	**1712**
		$2,600.00	**$70,560.00**	**$146,720.00**	**$19,950.00**	**$0.00**	**$239,830.00**
4.0	**Project Status Reports**						
4.1	Prepare Status Report with Monthly Invoices	-	7	4	-	4	15
	Sub-Total Task 4.0	**0**	**7**	**4**	**0**	**4**	**15**
		$0.00	**$1,120.00**	**$560.00**	**$0.00**	**$240.00**	**$1,920.00**
5.0	**Meetings**						
5.1	Meetings (estimated 8)	2	20	18	8	-	48
	Sub-Total Task 5.0	**2**	**20**	**18**	**8**	**0**	**48**
		$400.00	**$3,200.00**	**$2,520.00**	**$760.00**	**$0.00**	**$6,880.00**
	Total Man-Hours Per Classification:	**21**	**582**	**1516**	**318**	**4**	**2441**
	Total Fee:	**$4,200.00**	**$93,120.00**	**$212,240.00**	**$30,210.00**	**$240.00**	**$340,010.00**