



STATEMENT OF QUALIFICATIONS
(TEC PROFESSIONAL SERVICES QUESTIONNAIRE)

PROFESSIONAL ENGINEERING AND SUPPLEMENTAL SERVICES FOR A
**DRAINAGE MASTER PLAN FOR THE
EAST BANK OF JEFFERSON PARISH**

RES. NO. 138896
SOQ 22-014

Jefferson Parish Purchasing Department

March 23, 2022



March 23, 2022

Jefferson Parish Evaluation Committee

RE: Professional Engineering and Supplemental Services for a Drainage Master Plan for the West Bank of Jefferson Parish

Dear Evaluation Committee Members:

Developing a document that will guide future drainage improvements and provide direction for development, is essential to Jefferson Parish, its residents, and stakeholders. The hydrology and unique aspects of Jefferson Parish's drainage system requires an advanced modeling skill set along with a deep understanding of local conditions. AECOM has assembled a team of local firms including expert modelers and planners to support the delivery of this Drainage Master Plan.

The AECOM Team provides Jefferson Parish experience and expertise that will assist the Parish in evaluating and improving localized and urgent drainage issues while concurrently developing a long-term, holistic approach to improving the parish's drainage network, which will enable your program to advance with exemplary results. AECOM has a proven track record of delivering on a wide range of projects and services for Jefferson Parish from our local Jefferson Parish and Louisiana offices and looks forward to continuing this track record of providing cost-effective solutions on time and within budget to support the Parish's initiative. Our team includes:

AECOM Technical Services, Inc. (AECOM) is a national leader in providing CTP services who brings the resources of 47,000 employees in more than 100 countries around the globe. Our local staff brings local modeling capabilities and Jefferson Parish Drainage System specific experience. Our Principal-In-Charge, Michael Patorno, participated in the development of the original West Bank Drainage Master Plan.

MSMM Engineering, LLC (MSMM) specializes in drainage infrastructure assessment and design. MSMM engineers total more than 150 years of design experience and combined have designed 250+ projects for Jefferson Parish. MSMM is currently completing a large-scale Watershed Management Plan for Jefferson Parish that includes extensive watershed modeling. This collaborative effort completed through the USACE New Orleans District helps identify drainage deficiencies while subsequently providing National Flood Insurance Program criteria for the benefit of Parish residents.

T. Baker Smith, LLC (TBS) has provided professional surveying services, including innumerable projects requiring LiDAR data collection, in Louisiana. With approximately 230 associates and nine office locations firm-wide, TBS will manage tasks resulting from this request from their Metairie, LA office. TBS' professionals remain on the cutting edge of technology, so that they can provide the most economically viable solutions to our clients. TBS owns and maintains one of the largest fleets of work boats and all-terrain vehicles to get to the most remote work site locations, along with 11 UAVs (unmanned aerial vehicles, i.e., drones).

BFM Corporation, LLC, Professional Land & Hydrographic Surveying has provided services to public and private concerns throughout Louisiana and the Gulf South. The firm provides surveying services covering all facets of engineering, construction, and forensics; topographic, hydrographic, and high definition laser scanning. Survey Field Crews are equipped with Leica Viva & Leica Captivate Data Collectors, as well as Leica GPS Smart Antennas. BFM is a majority Woman-Owned Business Enterprise (WBE) as well as a Hudson Initiative certified Small & Emerging Business and Small Entrepreneurship in Louisiana.

We will continue providing the resources and delivery excellence that Jefferson Parish has become accustomed to from AECOM on past and current project work. We appreciate the opportunity to present our qualifications to you and welcome the opportunity to discuss the project with you in more detail. I can be contacted by email at mike.patorno@aecom.com or phone at (504-338-9789).

Respectfully submitted for the AECOM Team,



Mike Patorno, PE, CPM
Principal-in-Charge

Technical Evaluation Committee (TEC) Questionnaire

Instructions

- The Technical Evaluation Committee (TEC) Questionnaire shall be used for professional services related to architecture, engineering, or survey projects.
- **The TEC Questionnaire should be completely filled out. Complete and attach ALL sections. Insert “N/A” or “None” if a section does not apply or if there is no information to provide.**
- Questionnaire must be signed by an authorized representative of the Firm. Failure to sign the questionnaire shall result in disqualification of proposer pursuant to J.P. Code of Ordinances Sec. 2-928.
- All subcontractors must be listed in the appropriate section of the Questionnaire. Each subcontractor must provide a complete copy of the TEC Questionnaire, applicable licenses, and any other information required by the advertisement. Failure to provide the subcontractors' complete questionnaire(s), applicable licenses, and any other information required by the advertisement shall result in disqualification of proposer pursuant to J.P. Code of Ordinances Sec. 2-928.
- If additional pages are needed, attach them to the questionnaire and include all applicable information that is required by the questionnaire.

TEC Professional Services Questionnaire

A. Project Name and Advertisement Resolution Number:

B. Firm Name & Address:

AECOM

C. Name, title and contact information of Principal, as defined in Section 2-926 of the Jefferson Parish Code of Ordinances, who is a registered, licensed architect, professional engineer, or surveyor in the State of Louisiana:

D. Name and contact information of employee who is a registered and licensed architect, professional engineer, or surveyor in the State of Louisiana in the applicable discipline. A subcontractor may be substituted here only if the advertised Project requires more than one discipline.

E. Please provide the number of employees whose primary function corresponds with each category:

- | | | |
|--|--|---|
| <input type="checkbox"/> Administrative | <input type="checkbox"/> Estimators | <input type="checkbox"/> Specification Writers |
| <input type="checkbox"/> Architects (Licensed) | <input type="checkbox"/> Geologists | <input type="checkbox"/> Structural Engineers |
| <input type="checkbox"/> Chemical Engineers | <input type="checkbox"/> Geotechnical Engineers | <input type="checkbox"/> Graduate Engineers |
| <input type="checkbox"/> Civil Engineers | <input type="checkbox"/> Interior Designers | <input type="checkbox"/> Project Managers |
| <input type="checkbox"/> Construction Inspectors | <input type="checkbox"/> Landscape Architects | <input type="checkbox"/> Clerical |
| <input type="checkbox"/> Ecologists | <input type="checkbox"/> Land Surveyor | <input type="checkbox"/> Grant/Funding Specialist |
| <input type="checkbox"/> Electrical Engineers | <input type="checkbox"/> Mechanical Engineers | <input type="checkbox"/> Sanitary Engineers |
| <input type="checkbox"/> Engineer Intern | <input type="checkbox"/> Environmental Engineers | <input type="checkbox"/> 104 Other |
| <input type="checkbox"/> Professional Land Surveyors | | <input type="checkbox"/> TOTAL |

** These numbers only represent our staff in Louisiana*

F. Is this submittal by a JOINT-VENTURE? Please check: YES _____ NO _____

If marked "No" skip to Section I. If marked "yes" complete Sections G-H.

TEC Professional Services Questionnaire

G. If submittal is by JOINT-VENTURE, list the firms participating and outline specific areas of responsibility (including administrative, technical, and financial) for each firm. Please attach additional pages if necessary.

1.

2.

**H. Has this JOINT-VENTURE previously worked together? Please check:
YES _____ NO _____**

I. List all subcontractors anticipated for this Project. Please note that all subcontractors must submit a fully completed copy of this questionnaire, applicable licenses, and any other information required by the advertisement. See Jefferson Parish Code of Ordinances, Sec. 2-928(a)(3). Please attach additional pages if necessary.

Name & Address:	Specialty:	Worked with Firm Before (Yes or No):
1.		
2.		
3.		

J. Please specify the total number of support personnel that may assist in the completion of this Project:

TEC Professional Services Questionnaire

K. List the professional in charge, key persons, specialists, and individual consultants anticipated for this Project and provide their relevant information below. If necessary, please attach additional documentation (i.e. resume) that demonstrates the employment history and experience of the Firm's key persons that may assist in the completion of this Project. Please attach additional pages if necessary.

PROFESSIONAL IN CHARGE OF PROJECT:

Name & Title:

Project Assignment:

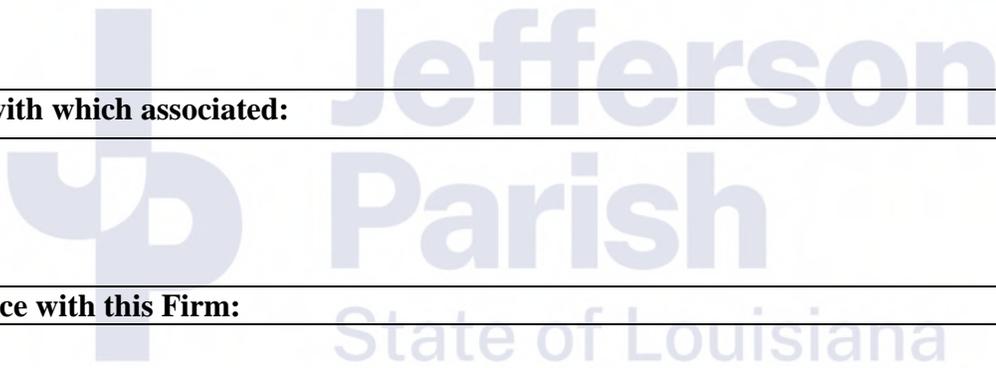
Name of Firm with which associated:

Years' experience with this Firm:

Education: Degree(s)/Year/Specialization:

Active registration: Year first registered/discipline:

Other experience and qualifications relevant to the proposed Project:



PROFESSIONAL IN CHARGE OF PROJECT:

Name & Title:

Michael Patorno, PE - Vice President, National Water Business Line, Heavy Civil Lead

West Bank Drainage Master Plans, Jefferson Parish, Project Engineer. Mr. Patorno provided modeling and mapping services as well as acted as senior Project Manager for the later updates to the West Bank Master Drainage Plan. Project work included working in various modeling software's USACE UNET, and SWMM, while evaluating existing conditions and recommended improvements to the Parishes West Bank Drainage System.

East Bank Jefferson Parish DFIRM Maps, FEMA Region - Project Manager. Mr. Patorno coordinated the updates for the FEMA DFIRM Maps with our team working for FEMA while coordinating with our local staff Jefferson Parish for modeling of the Greater Metro New Orleans Area.

State of Louisiana LWI Program, Technical Advisor. Mr. Patorno acted as Senior Engineering Technical Advisor for the LWI program which is a statewide drainage master plan including oversight of modeling efforts and standards while working with CPRA, LDOTD, LDEQ, FEMA and the USACE. This also includes evaluations of models from various regions including all Louisiana southern Parishes.

FEMA Lamp Program- Project Principal. Mr. Patorno worked to coordinate local Metairie Personnel with our National FEMA team in the overall evaluation and certification process of levee systems including the evaluation of existing systems and modeling in the greater metropolitan New Orleans Area including Jefferson Parish, City of New Orleans, and St. Tammany Parish.

Urban Drainage Design Projects, USACE New Orleans District, Jefferson Parish, Louisiana.

Projects Included:

- R.R. Canal improvements from Avenue "B" to the Keyhole Canal. The project included geotechnical, hydraulic, and structural engineering as well as coordination with the local sponsors, utility companies and the railroad.
- Swift/Canal "A." The project included geotechnical, hydraulic, civil, and structural engineering for canal improvements from Canal "A" along the West Bank Expressway to the Patriot Street Canal.
- Elmwood Canal Bridge Crossing at Kawanee Avenue. The project included design reports, design plates/drawings, detailed structural, civil, hydraulic and geotechnical design calculations, cost analysis and estimates, traffic analysis and utility design for improvements to replace an existing bridge and approaches traversing an existing major canal. Eventual construction will include maintenance of traffic, detours, major utility relocations, installation of phased bridge construction and roadway approaches.
- Algiers Canal. The project included geotechnical, hydraulic, civil and structural engineering, levee improvements, flood control structures, ramps and pavement designs for a major levee in Jefferson and Plaquemines Parishes.
- Swift and 4th Street Canals. Used the USACE UNET model for this area in coordination with Jefferson Parish to find solutions to alleviate flooding in the area.

Drainage Pumping Stations Jefferson Parish- USACE New Orleans District and Jefferson Parish.

Mr. Patorno acted as lead technical advisor and project manager for the following pumping stations in Jefferson Parish including- Barataria, Westminster Lincolnshire, Old Estelle, New Estelle, Elmwood and Pumping Station No. 6. Mr. Patorno also provided modeling services and analysis for the Pump to the River Project as well as Drainage Improvements throughout Jefferson Parish on Mounes Blvd and throughout the Clearview, River Ridge and Little Farms Area.

PROFESSIONAL IN CHARGE OF PROJECT:

Name & Title:

Michael Patorno, PE - Vice President, National Water Business Line, Heavy Civil Lead

Drainage Canals and Subsurface Systems, Jefferson Parish. Mr. Patorno was lead engineer for the design of various Jefferson Parish Drainage Canals including: Patriot Street Canal, Elmwood Canal, Kawanee Bridge and Canal, Avenue B, Avenue D, Swift Canal, Railroad Canal and 17th Street Canal.

Louisiana Coastal Protection & Restoration Authority Maurepas Swamp Freshwater Diversion Structure, St. John the Baptist Parish, LA. Managed multidisciplinary project involving similar scope of work areas as the proposed project, including planning, project management, modeling, design, detailed GIS, and aerial mapping. Included preparation of an economic and hydraulic feasibility study and contract plans and specifications to install a diversion head works structure and conveyance canal. Project to divert Mississippi River water into the wetlands south of Lake Maurepas through the use of a control structure at the Mississippi River and conveyance channel for eco-system restoration purposes.

Reserve Sanitary Sewer Evaluation Study (SSES) and Sewer Repair Design Project, St. John the Baptist Parish, LA (St. John the Baptist Parish). The project involved program management of various consultants doing field investigations, smoke testing, flow monitoring and television inspection of the Parish's sewer system. The result of the study was detailed in reports noting problem areas, proposed solutions, costs and priority lists for repairing, improving and maintaining the system. A final phase of the project for the sewer system involved the designs for the problem areas in a phased approach.

Hurricane Protection Office (HPO) LPV 105-111, New Orleans, Louisiana (USACE-Hurricane Protection Office (HPO), Program Manager. In a follow-up contract to the Task Force Guardian program, awarded contract to assist the HPO with providing improvements to the levee system in New Orleans East. Includes design and construction of floodwalls, levees and gates, and requires utility relocation, pump station remediation, and real estate coordination. Managed all aspects of this \$1.3B geotechnical investigations, feasibility reports, Engineering Alternatives Reports (EARs), design and plans, and specifications for approximately 30 miles of Hurricane Flood Protection System. Worked closely with the HPO team to investigate cost-effective and workable solutions to meet the short time frame. Managed team using staff from multiple offices to maintain HPO's schedule.

Program Management, 1998 Road Bond Improvement Program, Jefferson Parish, Louisiana. Principal for Jefferson Parish's Program, which includes 112 roadway and bridge projects throughout the Parish. The project included writing contracts and amendments for engineer's contracts; planning meetings; coordination of consultants Parish departments, Parish's politicians, SELA, LDOTD (when necessary), railroad companies and public and private utilities; approving consultant invoices and construction cost estimates; oversight on design; review of plans and specifications submittals; scheduling; budget analysis; right-of-way acquisition support; construction oversight; review of contractor invoices and claims; and project closeout. As a part of this program numerous intersections and signals were upgraded.

TEC Professional Services Questionnaire

KEY PERSON, SPECIALIST, OR INDIVIDUAL CONSULTANT:
Name & Title:
Clay Loyless, PE <i>Sr. Civil Engineer/Sr. Project Manager</i>
Project Assignment:
Project Manager
Name of Firm with which associated:
AECOM Technical Services, Inc.
Years' experience with this Firm:
14
Education: Degree(s)/Year/Specialization:
MS/1995/Civil Engineering BS/1980/Civil Engineering
Active registration: Year first registered/discipline:
Professional Engineer, LA #0028552
Other experience and qualifications relevant to the proposed Project:
Mr. Loyless has 40 years of Civil Engineering experience in design and construction management with emphasis in drainage, water, wastewater and stormwater projects. He has designed wastewater and stormwater pump stations, sewer force mains, and gravity sewer and drainage collection networks. His additional experience includes detailed design of all proposed infrastructure improvements for site design. Mr. Loyless is proficient at hydrologic studies and models and is known for his attention to detail. He has analyzed the hydrology and hydraulics for numerous projects, established Base Flood Elevations, and designed drainage features, including stormwater collection networks and detention ponds. He has performed Hydrologic Modification Impact Analyses on many sites, designed culverts and conveyance channels, and energy dissipation devices. His design methodology has gone from hand calculations, through the use of various software packages over the years from early versions of StormCAD and PondPack to the current HEC-RAS and SWMM programs. Mr. Loyless has also worked on numerous roadway re-construction projects including design of horizontal and vertical geometry, pavement repair, milling and overlaying, etc. His additional experience includes detailed design of all proposed infrastructure improvements for subdivision and site design. Mr. Loyless has also conducted Phase I ESA's, prepared EA's, and secured USACE section 404 wetlands permits.

PROFESSIONAL IN CHARGE OF PROJECT:

Name & Title:

Clay Loyless, PE - Project Manager

LADOTD Rehabilitation Projects, Jefferson Parish, LA. Designed and managed the construction administration for numerous LADOTD state highway rehabilitation projects in Jefferson Parish, including Lapalco Blvd, Veterans Blvd, and Willswood Lane.

Wastewater Infiltration & Inflow Study, Jefferson Parish, LA. Developed portions of the Jefferson Parish Infiltration & Inflow flow monitoring program. Participated in the field surveys; wrote the Flow Monitoring Program Report; developed flow-meter installation, operation and maintenance procedures; evaluated vendor equipment and software; and wrote a confined space entry manual.

Hickory Avenue Extension Drainage Facilities, Jefferson Parish, LA. Designed the drainage facilities for the extension of Hickory Avenue, a LADOTD state highway.

CWPPRA Project Development, Jefferson Parish, LA. Developed list of potential projects to mitigate the effects of coastal erosion and the loss of wetlands in Jefferson Parish. Defined thirty-three projects sufficiently to apply for federal CIAP and CWPPRA funding.

Mississippi River Diversion into Maurepas Swamp, St. John the Baptist Parish, LA (Coastal Restoration Division, Louisiana Department of Natural Resources), PM \ Lead Engineer. PM \ Lead Engineer for design of a gated diversion structure on the Mississippi River and diversion channel to the wetlands surrounding Lake Maurepas. Responsibilities include project management, hydraulic analysis, and Civil Engineering design aspects of the intake structure to be constructed integral with the levee system, the 150-foot wide, 5-mile long diversion channel, and the flow distribution system.

USACE New Orleans District, Permanent Canal Closures & Pump Stations (New Orleans, LA) Technical Reviewer. Reviewer for DQA team in support of the USACE providing oversight of the design of storm-water pump stations at 17th St, Orleans Ave and London Ave canals. With a combined pumping capacity of nearly 10 million gpm, these are some of the largest drainage pumping stations in the world. Responsibilities included providing technical design input on Civil Engineering, ensuring compliance with all USACE guidelines, and conformance to the Joint-Venture Contractor's contractual requirements.

CPRA Mid-Barataria Sediment Diversion (Plaquemines Parish, LA), Civil Engineer. Performed Revetment Study evaluating various types of erosion protection for Basis of Design report. Worked on design of riprap revetment for Intake, Conveyance Channel, and Outfall.

USACE, Hurricane Protection Office, Levee Improvements LPV 109.02a, New Orleans, LA, Civil Engineer. Lead Civil Engineer for the design of 7.5-miles of flood protection levee in New Orleans East. Responsibilities included the detailed design of new levee sections, including the crossing of two major roadways and one railroad, along with the design of two drainage pump stations and four major sluice-gated box culvert drainage crossings. Worked in close coordination with staff geotechnical engineers on design involving the installation of wick drains and deep soil mixing, to greatly accelerate the levee consolidation process. Work included the hydrologic and hydraulic analyses and engineering design of the pump stations and drainage culverts under the levee.

Lower Breton Sound Sediment Diversion, Coastal Protection and Restoration Authority (Plaquemines Parish, LA). Project Engineer on the conceptual design of a sediment diversion to transport sediment from the Mississippi River into the lower Breton Sound Basin in order to build, sustain, and maintain wetlands. Responsibilities included the direction of hydraulic modeling analyses to develop channel configurations that would deliver the requisite flow and entrained sediment. Also conducted a study of applicable revetment options for hydraulic efficiency and protection from scour.

PROFESSIONAL IN CHARGE OF PROJECT:

Name & Title:

Clay Loyless, PE - Project Manager

St. Charles Parish Railyard (Dow), Port of South Louisiana. St. Charles, La. Design Engineer.

Performed hydrologic and hydraulic analysis of site. Designed drainage collection network and stormwater detention pond. Delineated drainage easement and obtained approval from adjacent property owner. Prepared Hydrologic Modification Impact Analysis and secured permit approval.

Lakefront Seawall Erosion Control Paving Project (New Orleans, LA. Project Engineer. Developed Basis of Design Memorandum and performed design engineering services on Phases 1A & 3B; 1C, 2A & 5B; and 2C, 2D & 3C.

The project was designed to stabilize the seawall, control erosion, improve drainage, and create a pedestrian walk between the seawall and Lakeshore Drive. A combination of paved area and turf reinforced matting was used to control erosion. To ensure drainage of Lakeshore Dr., a system was designed to transfer runoff from the roadway through the seawall. The plaza area is raised above the road and seawall with a five foot wide crest to assist in deflecting overtopping wave action. Work included design of typical sections, cross-sections, and pavement marking and permanent signage plans.

Fargo-Moorhead Area Diversion Project, Fargo-Moorhead Diversion Authority, (Fargo, ND \ Moorhead, MN). Sr. Project Engineer.

The project consists of a diversion of the Red River of the North through a 25 mile long channel around the cities of Fargo, ND and Moorhead, MN to prevent recurrent flooding. The plan would include 20 highway bridges, 4 railroad bridges, and a control structure on the Red River. The subject role as Drainage Lead was to design all of the drainage facilities required to relocate the road and railroad bridges as well as handle the runoff from the diversion guide levees. The work included H&H analyses, culvert and conveyance channel design, and design of energy dissipation devices. Work currently in abeyance due to on-going discussions within the respective governments.

Wanhua MDI Complex Hydrologic & Hydraulic Analysis, Wanhua Chemical Group - US (St. James Parish, LA)Sr. Project Engineer:

Wanhua proposes to build a major chemical plant on the East Bank of the Mississippi River, including the construction of major process equipment, storage tanks, cooling towers, horizontal vessels, buildings, etc. As Project Manager, performed an HMIA, using LiDAR data to delineate watersheds, and determined the 100-yr WSE. Performed detention pond routing to demonstrate no adverse effect due to development. Subsequent analyses were performed using the HEC-RAS Unsteady State modeling software to developed options to lower the requisite site fill. Recommended improving the main discharge ditch by removing existing culverts and re-shaping the ditch into the shape of a trapezoidal channel. Using the model, based on the recommended improvements, demonstrated depth and duration of flooding on adjacent agricultural property. Currently analyzing the effectiveness of adding a supplemental Pump Station to prevent flooding.

TEC Professional Services Questionnaire

KEY PERSON, SPECIALIST, OR INDIVIDUAL CONSULTANT:
Name & Title:
Daniel Zell, PE, PMP, CFM, D.WRE, PgMP <i>Associate Vice President, Water</i>
Project Assignment:
Subject Matter Expert - QAQC
Name of Firm with which associated:
AECOM Technical Services, Inc.
Years' experience with this Firm:
9
Education: Degree(s)/Year/Specialization:
MA/2003/Economics BSc/1996/Mechanical Engineering
Active registration: Year first registered/discipline:
Professional Engineer/Civil-Water Resources, Texas #123073, DC Certified Floodplain Manager; Project Management Professional Diplomat of Water Resources Eng
Other experience and qualifications relevant to the proposed Project:
Dan Zell offers 19 years of experience, including 14+ years on FEMA Risk MAP, HMTAP, and Map Mod programs, where he successfully completed 30+ projects for Region IX. He successfully met schedule, cost, reporting and quality requirements as a project manager. Dan completed high-profile studies including Post-Katrina Mississippi Coastal, Post-Katrina New Orleans Field Reconnaissance, and Post-Katrina Evacuee Assistance. Dan led several levee projects and was the primary author of FEMA's Levee Analysis and Mapping Procedures (LAMP). His recent levee experience includes City of Austin, Pope and Conway Counties (Arkansas), and levees in California and Hawaii. His post-disaster work includes 2020 Hurricanes Laura, Delta, Zeta and Tropical Storm Cristobal.

PROFESSIONAL IN CHARGE OF PROJECT:

Name & Title:

Daniel Zell, PE, PMP, CFM, D.WRE, PgMP- Subject Matter Expert - QAQC

Levee Analysis and Mapping Technical Assistance, Subject Matter Expert, Greater New Orleans Area. Worked with the Parish side by side while under contract by FEMA piloting FEMA's procedures for non-accredited levees, known as Levee Analysis and Mapping Procedures (LAMP) in the Greater New Orleans Area. AECOM identified and supported 5 pilot projects in Lafourche, Plaquemines, St Charles, St. Tammany, and Terrebonne Parishes. AECOM planned and conducted outreach, known as Local Levee Partnership Team meetings and field reconnaissance. The LAMP LLTP outreach effort were welcomed by the Parishes, in comparison to prior procedures, as a more holistic and fair process.

FEMA, Levee/Dam Safety Program, Nationwide. Project Manager for half of United States including Texas. Developed and implemented a customized dam safety training for FEMA staff responding to Hurricane Harvey at Austin JFO. Supported pilot probabilistic flood risk analysis Risk Rating 2.0) levee analysis. Provided real-time data and analysis of impacted dams for Harvey, Irma, and Maria.

FEMA, Manasquan CRS Improvements, New Jersey. Project Manager for working with a small community with a goal of raising their CRS rating. Researched their current CRS points and identified areas for improvement. Provided training on how to use social media immediately prior to Hurricane Sandy where the emergency operations center was destroyed and social media was successfully leveraged. This community went from a CRS level 7 to 5. Interactive maps (story maps) were displayed on FEMA's Geoplatform.

FEMA, Letter of Map Change (LOMR/LOMA, Nationwide. Deputy Project Manager for startup of Letter of Map Change program under RiskMAP. Developed and implemented a digital processing system for letters of map amendment. Responsible for reporting (including the MIP) and overall technical credibility.

State of South Carolina, Community Development Block Grants, South Carolina. Led project prioritization efforts for this large effort to analyze flooding and prioritize projects for flood mitigation. Specifically developed recommendations for screening criteria to achieve project goals. Verified that projects were in compliance with HUD goals.

Texas Water Development Board, Base Level Engineering, Austin, TX. Project Director responsible for resource control and allocation for Atascosa and Lower Brazos/Little Brazos watersheds totaling over 5,600 stream miles. Personally, led development and delivery of technical memorandums on project prioritization.

FEMA CTP Services, San Antonio River Authority, San Antonio, TX. Project Director responsible for resource control and allocation for Leon Creek. Personally, planned and conducted field reconnaissance of structures. Scope included 56 miles of detailed hydrology, hydraulics, and floodplain mapping including Karst hydrology and regulated flows.

FEMA, FY17 Regional Task Order, TX. Project Manager for three components Incorporation of NOAA Atlas 14 and USACE InFRM Hydrology into the Guadalupe River (HEC-HMS), updated rating curves for dams and floodway modeling (HEC-RAS) 2,000 miles of Base Level Engineering (HEC-RAS) and 11 miles of detailed hydraulics in Middle Brazos Lake Whitney including statistical hydrology (regression calibrated to gauge analysis) Analysis of levees, detailed hydraulics (HEC-RAS), and floodway models for the East Fork Trinity.

TEC Professional Services Questionnaire

KEY PERSON, SPECIALIST, OR INDIVIDUAL CONSULTANT:
Name & Title:
Jeff Irvin, PE <i>Principal Engineer</i>
Project Assignment:
Watershed Planning
Name of Firm with which associated:
AECOM Technical Services, Inc.
Years' experience with this Firm:
37
Education: Degree(s)/Year/Specialization:
BSc/1972/Civil Engineering MSc/1981/Water Resources
Active registration: Year first registered/discipline:
Professional Engineer/Civil/Texas#85329
Other experience and qualifications relevant to the proposed Project:
Mr. Irvin has 37 years of experience and is a senior project manager and has directed the full gamut of studies and designs associated with flooding. He has led H&H for FEMA FIRMs in the Gulf Coast. He has performed numerous flood control channel hydraulic designs and/or evaluations involving modifications of FEMA models and has applied various fluvial geomorphic methods (e.g., Rosgen, USDOT HEC20) in identification of flow regime for evaluation of natural and designed channel stability. He is certified by the Department of Transportation for performance of hydrology, complex hydraulics, and bridge scour analyses.

PROFESSIONAL IN CHARGE OF PROJECT:

Name & Title:

Jeff Irvin, PE - Watershed Planning

Prairie Conservation Reservoir (PCR) Supplemental Watershed Plan, Lower Colorado River Authority (LCRA), Project Manager. Directed development of Supplemental Watershed Plan for construction of a new irrigation water supply regulating reservoir in Colorado County. The Plan was developed under a successful LCRA grant application under the NRCS Regional Conservation Partnership Program.

Texas State Flood Protection Plan, TWDB, Principal Engineer. Wrote portion of plan addressing state (Texas Soil and Water Conservation Board -TSSWCB) and federal NRCS programs for subsidizing the upgrade of NRCS-designed flood control dams built under Public Law (PL) 534 or 566. The task included meetings with both agencies and text review to obtain approval both for description of risks and funding programs.

NRCS Supplemental Watershed Plans and EAs for 11 flood control dams in Texas. Principal overseeing the plans. These plans included concept designs and cost estimates to upgrade existing dams to meet both Texas (TCEQ dam safety) and NRCS (TR60) design criteria, plus assessment of impacts per NEPA requirements (including coordination with USACE, USFWS, THC). Plans for 7 dams have been approved by the NRCS National Watershed Management Center, with plans for 4 dams currently underway.

Holistic Watershed Master Plan for Wilson, Karnes, and Goliad Counties (2014-2016) for San Antonio River Authority. RFPP for two counties (Karnes and Goliad). Plan also addressed these issues in all three counties: water quality, opportunities for low impact development, conservation easements, stream restoration, nature-based parks, and analysis of available funding.

EI Paso County Storm Water Management Plan. RFPP for unincorporated county (2010, 2020-21 update). Project included risk assessment for widely varying hydrologic conditions (mountains, mesa, dense urban area with wide range of income/ types of residential structures, irrigated riverine flood terrace), a wide range of concept designs and cost estimates (detention/retention structures, channel improvements, storm water pump stations, road crossing upgrades), and leadership of several public meetings.

City of EI Paso Storm Water Management Plan. RFPP for City of EI Paso (2009, 2020-2021 update). Project included risk assessment for widely varying hydrologic conditions (mountains, mesa, dense urban area with wide range of income/ types of residential structures, irrigated riverine flood terrace), a wide range of concept designs and cost estimates (detention/retention structures, channel improvements, storm water pump stations, road crossing upgrades), and leadership of several public meetings.

Upper Brushy Creek Flood Protection Plan. RFPP developed for Upper Brushy Creek WCID for portions of 5 cities in southern Williamson County (including Austin, Round Rock, Cedar Park, Hutto, Leander) and portions of unincorporated county. Project included risk assessment for dense urban area, a wide range of concept designs and cost estimates (detention/retention structures, channel improvements). Follow-on work included final and/or concept design for several projects in the RFPP (new dams 101 and 102, modifications to existing dams 8 and 11); and studies relevant to detention storage fee assessments.

TEC Professional Services Questionnaire

KEY PERSON, SPECIALIST, OR INDIVIDUAL CONSULTANT:
Name & Title:
Rusty Rex, CFM, GISP, GIS Supervisor
Project Assignment:
Data Gap Analysis & Data Gathering
Name of Firm with which associated:
AECOM Technical Services, Inc.
Years' experience with this Firm:
2
Education: Degree(s)/Year/Specialization:
BS/2006/Geography
Active registration: Year first registered/discipline:
Certified GIS Professional (GISP) Certified Floodplain Manager (CFM), TX FAA Part 107/Remote Pilot
Other experience and qualifications relevant to the proposed Project:
Mr. Rex has over 14 years experience in GIS and data management. This includes many private sector clients as well as HCFCD, USACE, FEMA and TX GLO. He has extensive experience with GIS related to water resources. This includes land cover classifications, terrain development and floodplain mapping. He also has experience with disaster response, development planning, and data analytics and scripting. He has technical expertise in python, SQL, spatial analysis, FGDC metadata, accuracy assessment, horizontal and vertical datums, and technical reviews. He is a technical expert with ArcGIS Desktop.

PROFESSIONAL IN CHARGE OF PROJECT:

Name & Title:

Rusty Rex, GISP, PE - Data Gap Analysis & Data Gathering

MAAPnext Watershed Flood Study (Multiple), Harris County Flood Control District, Lead GIS Analyst, Texas. Mr. Rex serves as the Lead GIS Analyst for the terrain development, floodplain mapping, and database management tasks. He also supports hydrology tasks through spatial analysis and scripting. His responsibilities include terrain data fusion, bathymetry interpolations, database management, floodplain processing, map production, and preparing FEMA-compliant flood risk product submittals.

FIRM & FIS Updates for Multiple Counties and Incorporated Communities, Texas, FEMA Region VI. Mr. Rex served as a task manager and cartographic lead for 5+ studies related to FIRM & FIS updates. This include map production, database management including geometric topology work, terrain development, FGDC compliant metadata, TSDN Submittals, and detail check and independent technical reviews.

Deepwater Horizon Disaster Response, BP, GIS Specialist, Louisiana. Mr. Rex served as an emergency response GIS Specialist for environmental services and shoreline protection. Worked with local officials, state and federal agencies, and the U.S. Coast Guard under the Incident Command System. Provided ad-hoc mapping and analysis, imagery interpretation, and automated processes to track cleanup progress.

Tier 1&2 Resource Development Plans, OXY, Facility Surface Planner, Texas and New Mexico. Mr. Rex served as the Facility Surface Planner for several master planned unconventional resource developments. This included stakeholder engagement and spatial analysis for facility siting and optimized routing. This also included navigating complex regulatory environments as well as project execution and management of various data and surveyor workflows.

Land Cover, Pervious/Impervious, and Change Detection, Harris County Flood Control District , GIS Specialist, Harris County, Texas. Mr. Rex served as technical lead for land cover classifications using satellite imagery and lidar. Analysis included modern imagery tasking as wells as USGS and USDA historical aerial photography from the 1980's to detect change over time and to calibrate hydrology models. Performed NDVI, unsupervised and fuzzy classifications, neighborhood filters, ancillary data fusion and NSSDA accuracy assessments.

TEC Professional Services Questionnaire

KEY PERSON, SPECIALIST, OR INDIVIDUAL CONSULTANT:
Name & Title:
Dave Turk, CFM, GISP <i>Associate Vice President, Program Management</i>
Project Assignment:
Spatial Tools & Visualization
Name of Firm with which associated:
AECOM Technical Services, Inc.
Years' experience with this Firm:
16
Education: Degree(s)/Year/Specialization:
MS/2003/Geography BS/1995/Geography
Active registration: Year first registered/discipline:
GIS Professional, #00058348 Certified Floodplain Manager, # NM-06-00172
Other experience and qualifications relevant to the proposed Project:
Mr. Turk brings more than 24 years of progressive experience in leadership, team development, and program management. He serves as a client management professional providing water resources engineering, information management services, and Geographic Information System (GIS) for federal, state, local, and tribal entities. Among his professional community service and leadership accomplishments, David is the immediate past Chair of the New Mexico Floodplain Managers Association after serving a 4-year term.

PROFESSIONAL IN CHARGE OF PROJECT:

Name & Title:

Dave Turk, GISP, CFM - SPatial Tools & Visualization

Principal-in-Charge, Land Information Management Systems (LIMS) Development, Navajo Housing Authority (NHA), Navajo Nation: As PIC, Mr. Turk is responsible for overall planning, client communication, and direction of AECOM team so that the project is on schedule and meet or exceeds client requirements and specifications. NHA requires the continued project development of the LIMS to enable more efficient business processes and operations. This requires integration of essential planning data into the LIMS, updates and redesign of web applications, and development of business operation and reporting tools. NHA also requests the development of GIS standard operating procedures and **workflows to streamline business practices and advance their program.**

Principal-in-Charge, Detailed Flood Study and Flood Hazard Mitigation Alternatives, Navajo Housing Authority, Various locations in New Mexico and Arizona (Navajo Nation): Mr. Turk was responsible for management of professional services to delineate a detailed floodplain by 2D flood routing methodology in various locations across New Mexico and Arizona. Project involved collection of detailed topography using an unmanned aircraft system, and U.S. Department of Housing and Urban Development (HUD) floodplain management decision process to identify and evaluate practicable flood hazard mitigation alternatives. This project, for Crownpoint, NM, won a 2018 American Council of Engineering Companies of New Mexico Engineering Excellence Award.

Project Manager, Land Information Management System (LIMS), Navajo Housing Authority (NHA) Navajo Nation: Served as project manager to lead a GIS and IT team that designed, created, implemented, and maintained a geospatially enabled IT infrastructure and integrated GIS web-based system to provide a centralized, secure, and integrated digital repository of accurate NHA land information accessible by NHA users to streamline business processes.

Project Manager, Flood Mitigation and Stream Restoration Project, Santa Clara Pueblo, New Mexico: Mr. Turk served as project manager leading a multidisciplinary team to provide solutions that will mitigate flooding and improve the ecology of the watershed since the 2011 Las Conchas fire and subsequent flood events. Projects include design of concrete arch culverts, road armoring, and bioengineering projects in the upper canyon of Santa Clara Pueblo. Project is ongoing with environmental permitting, cultural surveys, design report, and 30-, 60-, 90-, and 100-percent designs planned, along with 3D rendering for community outreach.

TEC Professional Services Questionnaire

KEY PERSON, SPECIALIST, OR INDIVIDUAL CONSULTANT:
Name & Title:
Chris Levitz, PE, CFM <i>Coastal Engineering and Resiliency Manager</i>
Project Assignment:
Coastal Engineering and Science
Name of Firm with which associated:
AECOM Technical Services, Inc.
Years' experience with this Firm:
16
Education: Degree(s)/Year/Specialization:
BSc/2005/Civil Engineering
Active registration: Year first registered/discipline:
Professional Engineer/Civil/LA/0041472; TX, MS Certified Floodplain Manager
Other experience and qualifications relevant to the proposed Project:
Mr. Levitz specializes in resilience planning and design, with a strong coastal and flood risk focus. Through these efforts he has made consensus building communities a priority, working to align community development goals with ecological and long-term climate change needs. Developing approaches to merge green and gray infrastructure for a more resilient and adaptable community future is his focus, bringing these elements into planning and design. Mr. Levitz has significant experience working on an assortment of coastal and flood risk projects, including work for the USACE, FEMA, Texas GLO, and many other state and local clients. His experience includes modeling (hydraulic, coastal, and climate change), design, permitting, and planning efforts. Through these efforts, Mr. Levitz often serves as the project manager or technical lead, providing the comprehensive vision for plans, studies, and designs.

PROFESSIONAL IN CHARGE OF PROJECT:

Name & Title:

Chris Levitz, PE, CFM - Coastal Engineering and Science

Texas Coastal Resiliency Master Plan, Project Manager, Texas Coast, Texas General Land Office.

Efforts include technical analysis (cost, economics, physical, risk, environmental, and feasibility), planning, outreach, and management. These efforts were being done in cooperation with client team members, as well as academic and outreach entities, to ensure the Resiliency Master Plan is a living document that is constantly being improved and that all recommendations within the report are the most efficient and beneficial for the State of Texas. AECOM has worked with the GLO to issue Resiliency Plans in 2017 and 2019.

MAAPnext Flood Studies, Harris County Flood Control District, Texas. Mr. Levitz serves as deputy project manager responsible for stakeholder engagement, flood risk analysis and floodplain mapping tasks to produce new and updated flood hazard data. His responsibilities have included developing a project technical approach, managing hydrologic and hydraulic analyses teams (rainfall hydrographs, terrain and land use adjustments, structure analysis, 1D/2D interfaces and lateral structures), performing 1D/2D unsteady hydraulic modeling in HEC-RAS v.5.0.7, and preparing FEMA-compliant flood risk product submittals.

Freeport Hurricane Flood Protection System Improvements, Coastal and Hydraulic Lead, Freeport, Texas, USACE Galveston District. AECOM is performing comprehensive engineering and design services for the upgrades to the existing Freeport Hurricane Flood Protection System, including levees (including roadways), floodwalls, and flood gates. Mr. Levitz serves as the hydraulics lead and co-lead for coastal processes. Under this role, he works with the civil, geotechnical, and structural design team to properly account for all forcing conditions throughout the system, including future conditions including sea level change.

Risk MAP PTS Contract/Nationwide, FEMA. Mr. Levitz's responsibilities included managing the production team in producing updated spatial and non-spatial files for the revised flood maps. These efforts included leading the development of an updated Harris County FIS Report that incorporated revisions to the previously described watersheds and associated watersheds. Text, flood profiles and floodway data tables were revised to reflect updated data. He assisted in ensuring all spatial data meets FEMA specifications.

Lower Brazos Watershed Phase 2 Flood Studies, Hydraulics Engineering Lead, FEMA Region VI, Various Locations, TX. Hydraulic engineering lead for production of all submittals for a FEMA Risk MAP project including topographic data development, H&H studies of 347 stream miles, floodplain mapping, and associated Risk MAP non-regulatory products. Utilized GeoRAS, HEC-RAS steady flow, ESRI ArcGIS, and FLO-2D software.

Hydraulic Design Manual - Coastal Chapter, Project Manager, Texas Coast, Texas Department of Transportation. TxDOT determined a need for a coastal chapter to be added to their Hydraulic Design Manual. Mr. Levitz serves as the AECOM project manager leading the effort to assemble content regarding coastal design guidance with respect to water levels, waves, currents, erosion and scour, relative sea level rise, building materials, and an overall guidance framework.

Texas Coastal Hazard Analysis Resources & Technology, FEMA Region VI, Various Locations, TX. Mr. Levitz served as the engineering lead and was responsible for serving as Hydraulics and Coastal Engineering expert for all community outreach meetings. TXCHART is FEMA's comprehensive approach to integrating flood hazard identification and analysis with risk communication for 17 coastal counties.

TEC Professional Services Questionnaire

KEY PERSON, SPECIALIST, OR INDIVIDUAL CONSULTANT:
Name & Title:
Sreenivasulu Bollu, PE, CFM, PMP <i>Civil Engineer</i>
Project Assignment:
Hydrology and Hydraulics
Name of Firm with which associated:
AECOM Technical Services, Inc.
Years' experience with this Firm:
1
Education: Degree(s)/Year/Specialization:
BS/2000/Civil Engineering MS/2003/Civil Engineering
Active registration: Year first registered/discipline:
Professional Engineer, LA, 34330, 2009; TX Project Management Professional ASFPM Certified Floodplain Manager
Other experience and qualifications relevant to the proposed Project:
Mr. Bollu is Civil Engineer with over 18 years of experience in all phases of project development from conceptual design to construction management. He is in charge of project management and the civil engineering personnel, including schedules, staff, budgets, technical review and account management. He has provided professional consulting services to numerous public and private clients, serving as Project Manager or Project Engineer on numerous roadway improvements, drainage studies, hydrologic and hydraulic (H&H) analyses and modeling drainage improvements, levees, flood control projects, site developments, utility design, commercial & residential subdivisions, and construction management.

PROFESSIONAL IN CHARGE OF PROJECT:

Name & Title:

Sreenivasulu Bollu, PE, CFM, PMP - Hydrology and Hydraulics

East Bank Drainage Improvements, St. Charles Parish, LA. Lead Hydraulic Engineer/Project Manager responsible for creating H & H models to evaluate flooding within the existing neighborhood, provide alternate solutions to alleviate flooding and develop a report with recommended solutions with cost estimates for 25yr and 100yr rainfall events.

West Bank Hurricane Protection Levee System (WBHPL), St. Charles Parish, LA. Project Manager responsible for coordination, preparation of plans and specifications, construction administration and resident inspection. This project is approximately a nine (9) mile levee where the alignment extends from the Sunset Levee District on the western flank to the Davis Pond Guide Levee to the east. This project consists of levees, drainage borrow canals, parallel access roads for levee maintenance, pump stations, tidal exchange structures, and concrete floodwalls (T-Walls) at multiple locations.

Railroad crossing H&H Modeling, Jefferson Parish, LA. H&H model to study inadequate drainage crossings under the railroad tracks between the Mississippi river and US 90 in the Waggaman area of Jefferson Parish from Avondale Garden Road to Modern Farms. The project required the collection of topographic survey data and the input of data into an existing conditions hydraulic model. A hydrologic model was then constructed to simulate an actual rainfall event. The model is then calibrated and results are evaluated. Proposed improvements are then entered into the model to evaluate benefits. A report was prepared which recommended an improvement option with preliminary costs estimates. USACE HEC-HMS and HEC-RAS were used for the modeling software.

South Kenner Rd- Avondale Garden Railroad Crossing Drainage Evaluations, Phase, Jefferson Parish, LA. H&H study of a large basin draining to Lake Catouache. Nearly 29 miles of open channel flow over a total of 10,240 acres were modeled, contributing an estimated 13,500 cfs at the outfall. USACE HEC-HMS and HEC-RAS (unsteady flow with storage areas) were used to develop existing and improved state models, determining what combination of flood control projects will yield upstream flooding relief for residents, and open additional vacant property for development.

Maplewood Area Drainage, Jefferson Parish, LA. Provided project engineering for the development of construction drawings and specifications for the installation of 9,100 linear feet of stormwater culverts, 33 junction boxes, 80 catch basins, and 3,500 square yards of paving.

Upper Barataria Risk Reduction (UBRR), Lafourche Basin Levee District, LA. Project Manager responsible for coordination with the design team and regulatory agencies design of the segment of the project Segment 1, 2, 4 & 5). The details of the project are: The Upper Barataria Risk Reduction project provides continuous hurricane and storm damage risk reduction from LA Hwy 308 in Lafourche Parish to the Davis Pond Freshwater Diversion West Guide Levee in St. Charles Parish, affording risk reduction benefits for the six parishes in the project area, including Ascension, Assumption, Lafourche, St. Charles, St. James, and St. John the Baptist. The UBRR project includes the construction and enlargement of approximately 33 miles of hurricane risk reduction between LA Hwy 308 on the western end and the Davis Pond Diversion West Guide Levee on the eastern end. The project includes earthen levees, a 270' steel barge swing gate floodgate in Bayou Des Allemonds, a steel rollergate across LA Hwy 306, tidal interchange structures, concrete T-wall floodwalls, and pump station frontal protection.

PROFESSIONAL IN CHARGE OF PROJECT:

Name & Title:

Sreenivasulu Bollu, PE, CFM, PMP - Hydrology and Hydraulics

Subsurface Drainage Improvement Program (SDIP, Jefferson Parish, LA. H & H models to evaluate repetitive loss/flooding areas within existing neighborhood subsurface drainage systems. The models were created using a combination of and analyzing GIS, LiDAR, and topographic survey data of pipe sizes and invert elevations. The project then included the creation of an existing condition model, calibration of the model, evaluation of existing conditions to propose alternative solutions and the development of a report with recommended solutions and cost estimates for delivery to Jefferson Parish.

Breaux Ditch Improvements - Jefferson Parish, LA. Project Manager responsible for civil design and preparation of the drawings to replace the existing ditch with 8' wide x 4' deep reinforced concrete flume between East Ames Blvd. and Leo Kerner Pkwy on the West bank of Jefferson Parish to provide improved maintenance and stability. The total project length is approximately 1500 feet.

Airline Park Blvd. Road and Drainage Improvements, Jefferson Parish, LA. Designed removal of 2,500 L.F. existing two-lane, two-way concrete roadway, along with removal and replacement of mainline subsurface drainage. Analyzed area hydrology and performed hydraulic calculations to establish proposed subsurface pipe sizes. Designed roadway vertical geometry and drainage structure placement to AASHTO standards providing pleasing riding characteristics and eliminating localized street flooding.

Plantation Estates Roadway and Drainage Improvements, Jefferson Parish, LA. Designed removal and reconstruction of residential streets in a flood prone subdivision. Reconstruction included raising in grade and realignment of the roadway to improve the drainage along with upgrading of the drainage conveyance system to the main trunk line including utility relocation and replacement of drives affected by the roadway replacement. Analyzed area hydrology and performed hydraulic calculations to establish proposed subsurface pipe sizes.

Orleans Village Drainage Improvements, Jefferson Parish, LA. Designed upsizing approx. 2,800 L.F. of subsurface drainage piping up to 72 in diameter in a residential area, including restoration of the roadway, replacement of the driveways and utility relocation.

Stumpf Blvd. Drainage Improvements (Friedrichs St. - West Bank Expressway). Project Engineer responsible for the development of plans and specifications for the installation of a 72-inch drainage pipe in the Stumpf Boulevard Canal. The pipe would provide sufficient capacity to convey storm water while addressing bank erosion.

Stumpf Blvd. Canal Improvements Westbank Expressway to Franklin Street, Gretna, LA. Project Engineer for the design of plans and specifications for closing of the existing canal with a box culvert and placing new turning lanes to provide access to the adjacent property.

TEC Professional Services Questionnaire

KEY PERSON, SPECIALIST, OR INDIVIDUAL CONSULTANT:
Name & Title:
Sarah McEwen, PE, CFM <i>Water Resources Manager</i>
Project Assignment:
Hydrology and Hydraulics
Name of Firm with which associated:
AECOM Technical Services, Inc.
Years' experience with this Firm:
5
Education: Degree(s)/Year/Specialization:
BS/2013/Civil Engineering
Active registration: Year first registered/discipline:
Professional Engineer, Civil, LA #0042539, MS, TX Certified Floodplain Manager 2014- License # US-14-07857, Certified Bridge Inspector
Other experience and qualifications relevant to the proposed Project:
Sarah McEwen, PE, CFM is the Water Resource Manager of the Jackson, Mississippi AECOM Office. She has extensive experience with managing DOT related projects with respect to Bridge Hydraulics, Scour Evaluations, Internal Technical Reviews, and Roadway Hydraulics. She is also experienced with hydrologic modification impact analysis as part of site design and erosion control measures. She has a background in floodplain mapping and is a certified floodplain manager. Sarah has experience in HEC-HMS, GeoRAS, HEC-RAS, HEC-DSS, HEC-SSP, PCSWMM, HY-8, Hydraulic Toolbox, XPSWMM, ESRI ArcGIS, AutoCAD, SRH2D, MicroStation and GeoPak.

PROFESSIONAL IN CHARGE OF PROJECT:

Name & Title:

Sarah McEwen, PE, CFM- Hydrology and Hydraulics

Louisiana Watershed Initiative, LOCD, Project Manager. The Louisiana Office of Community Development retained consulting firms to project management, design guidance review, and overall facilitation and quality control of the Louisiana Watershed Initiative. Mrs. McEwen serves as the Project Manager for Task 1 which includes leading a team to review current guidance/policies, summarize and present current data, develop a technical approach and guidance document for the Pilot Amite River model use and internal staff modifications. In addition, she serves as the Project Manager for Task Order 12 which includes project management of data and modeling activities. In this role she facilitates meeting between agency, consulting, and university stakeholders to support the development of technical guidance, oversees the HUC 8 regional models, and decision support tools. Her technical background allows her to advise and assist OCD on program decisions and support moving the multi-year schedule forward.

Drainage Impact Analysis, Lake Charles, LA for Sasol Chemicals, Project Manager and Hydraulic Engineer (USA) LLC. Served as project engineer that updated the HEC-HMS, HEC-RAS model, and report with as-built information. Also analyzed the results of preconstruction to post construction hydrologic and hydraulic impacts on FEMA and other regulations. Ongoing work to update report with design conditions and constructed as-builts for purposed of submitting a LOMR to the parish for inclusion in the FEMA map revision.

CPRA Mid-Barataria Sediment Diversion, Project Engineer. In charge of coordination with sub-consultants on weekly progress reports for submission to CPRA. Tasks include management and processing of data received from subconsultants. Other roles include reviewer of BODR report for technical approach and clarity. In addition, she led the scour evaluation of the bridge at a site with both riverine and coastal design factors evaluated for impact on the proposed structure including complex piers in a cohesive soil environment. Piers were evaluated using both HEC-18 and FLDOT methods due to the complex pier and cohesive soil conditions. A practical application of the scour methodology was used to replicate the most realistic scour conditions anticipated at the site.

CPRA Maurepas Swamp Engineering and Support Services, Project Engineer. Served as a project engineer in charge of reviewing existing XPSWMM subsurface modeling of local drainage in St. Johns Parish into Maurepas Swamp. The existing modeling was reviewed and converted into a PCSWMM model and updated with publicly available data for use in an evaluation of a diversion. Task include opening the existing model which was created in a version that is no longer recognized by current software, use and convert the available existing data in a new model, review for any land use or development changes, and develop a plan for necessary field data to be collected to finalize the updated existing conditions model. Current tasks include evaluating the hydrologic routing around the proposed diversion, updating the HEC-RAS modeling to incorporate new design changes, converting steady HEC-RAS into Unsteady 1D/2D model, and designing hydraulic structures to ensure capacity throughout system to swamp.

WR Grace Lake Charles Plant, Site Hydrology, Sulphur, LA, Project Engineer. Performed a hydrologic analysis for the refining facility using ArcGIS software and HEC-HMS. Analysis included various storm events along with considerations of changes to site water treatment, storage, and discharge. As project engineer, she also helped the client evaluate the hydraulic design submitted by another consultant for effectiveness with the site conditions. Additionally, she became the Deputy Project Manager for a supplemental agreement to evaluate the subsurface and surface drainage systems and develop construction plans of a conveyance channel.

PROFESSIONAL IN CHARGE OF PROJECT:

Name & Title:

Sarah McEwen, PE, CFM- Hydrology and Hydraulics

Hydraulic Modification Impact Analysis, Romeville, LA for Wanhua Chemical Group. Served as project engineer that generate predevelopment and post development hydrology for site including detailed land use and soil group investigation, developed drainage area hydrographs, an unsteady HEC-RAS model to evaluate hydraulic routing through the proposed detention ponds, and hydraulic report with results of the pre-development and post-development analysis. Include iterative design on the outlet control structures of two ponds.

FEMA Hydrologic and Hydraulic Support Services. General contract for support and served as the engineer in charge of review of engineering designs submitted for consideration of funding. Included review of geological, hydrologic, hydraulic, and groundwater design components for a site in New Orleans.

Lakefront Airport 2D Subsurface Modeling. General review and assistance on drainage design for the airport. As the project engineer work included using hydraulic software such as PCSWMM, to create hydraulic analysis of the pre- and post- conditions of site to drainage regulations.

Water Infrastructure, St. Charles Parish Railyard. General review and assistance on drainage design for the railyard site. Included hydraulic software such as HY-8 and Hydraulic Toolbox, and hydrologic analysis of the pre- and post- conditions of site to meet regulations.

FEMA Hydrologic and Hydraulic Support Services. General contract for support, review, and flood mapping services. The specific project was a request for review of incorporation of new survey data into an existing hydraulic model. Project engineer roles included review of existing FEMA model, updates to model to incorporate new survey and flowline data. The site experienced a flowline change and multiple openings within the floodplain. In order to evaluate the lateral overtopping a 2-dimensional model was developed to calibrate the updated 1-dimensional model. Other roles include the development of a community presentation and report of proposed changes for submission to Region 3. This project was the first use of 2-dimensional modeling in this FEMA region

TEC Professional Services Questionnaire

KEY PERSON, SPECIALIST, OR INDIVIDUAL CONSULTANT:
Name & Title:
Anthony Holder, PE, CFM <i>Senior H&H Specialist</i>
Project Assignment:
H&H Model Conversion
Name of Firm with which associated:
AECOM Technical Services, Inc.
Years' experience with this Firm:
19
Education: Degree(s)/Year/Specialization:
MS/1996/Environmental Science BA/1990/Physics
Active registration: Year first registered/discipline:
Professional Engineer/Civil, Environmental/TX#96751 Certified Floodplain Manager #1783-09N
Other experience and qualifications relevant to the proposed Project:
Mr. Holder has 23 years of experience in hydrologic and hydraulic analysis and drainage design for complex state, municipal, and private projects, including major transportation corridors and bridge structures, studies of FEMA-regulated streams, land development projects. This includes both detailed design of drainage structures/systems as well as large-scale impact analysis for urban and riverine civil infrastructure improvements. He is experienced in many commonly used 1D and 2D hydrologic and hydraulic analysis software packages, including XP-SWMM, EPA SWMM, MIKE 21, MIKE, 11, MIKE FLOOD, HEC-HMS, and HEC-RAS, and commonly used related software, such as ArcGIS and MicroStation .

PROFESSIONAL IN CHARGE OF PROJECT:

Name & Title:

Anthony Holder, PE, CFM- H&H Model Conversion

MAAPnext Greens Bayou Watershed Flood Study, Harris County Flood Control District.

Coordinating modeling efforts of six regional modelers that will be combined into a single watershed-wide model. Developed a method for extracting stage hydrograph and peak stage results for calibration storms to speed up the calibration process.

Risk MAP PTS Contract/Nationwide, FEMA. Served as task lead and subject matter expert for hydraulic modeling in the PFRA project. Developed a GIS-based method for enforcing break-lines for HEC-RAS to closely follow ridges in the terrain, especially where the ridges cross. Developed a technique for applying rating curves to simulate storm sewer capacity within the pluvial domains of the models. Developed a simple tool for applying bathymetry to LiDAR-based terrain that has standing water. Developed a process for extracting and comparing FIS profile WSEs and 2D model results for model calibration.

Region IX, Flood Risk Mapping, FEMA Region IX, Various Locations, CA. Provided model optimization, model de-bugging, and detailed QC review of XP SWMM 2D models for Ballona Creek and Kings River. Efforts optimized modeling approach, resolved instability issues, improved connectivity between the 1D and 2D models, confirmed that levees were properly modeled, and for one of the models, reduced model run-times by a factor of 7.

FEMA Natural Hazards Risk Assessment Program - Flood APEX Study. Reviewed several hydraulic models to assess their suitability for use in a rapid response modeling effort, collecting data on model characteristics such as cost, availability, development status, developer support, model capabilities, and model efficiency.

IH-610 / IH-69 Interchange, Texas Department of Transportation, Houston, TX. Mr. Holder served as Lead Drainage Engineer for the hydrologic and hydraulic analysis and final drainage design for reconstruction of portions of the IH-610 / IH 69 interchange in southwest Houston. The effort included detailed SWMM modeling of storm sewers, overland flow, pump stations, and mitigation facilities for a complex, interconnected pavement and drainage system with interconnected outfalls, depressed pavement, and elevated direct connectors.

Texas Department of Transportation, US 183 South (Bergstrom Expressway) Design-Build, Austin, TX. Specialist for complex drainage aspects of this design-build project. Tasks included coordinating updates to a HEC-RAS model for Little Walnut Creek crossing that were used to assess impacts and scour, coordinating modeling of two detention basins that required complex hydraulic analysis, and providing final quality control review of the drainage plans. The detention modeling supported the design of a low flow bypass system in one of the detention basins that allowed the client to make the most efficient use of limited right of way available for detention, meeting the project's goals without purchasing additional right of way.

North Harris Highway Improvement Project, Texas Department of Transportation, Harris County, TX. Serves as a subject matter expert and drainage technical lead for the sheet flow analysis portion of this project, which involves converting about 3 miles of freeway through downtown Houston to a depressed section, assessing and designing storm facilities to manage the overland flow approaching the project alignment from offsite. AECOM developed a 1D SWMM model that covers approximately 20 square miles of central Houston, including closed storm drainage, overland flow and storage, depressed pavement, pump stations, and siphons.

TEC Professional Services Questionnaire

KEY PERSON, SPECIALIST, OR INDIVIDUAL CONSULTANT:
Name & Title:
Samagra Rana, PE <i>Civil Engineer</i>
Project Assignment:
H&H Model Conversion
Name of Firm with which associated:
AECOM Technical Services, Inc.
Years' experience with this Firm:
6
Education: Degree(s)/Year/Specialization:
MS/2016/Water Resources BS/2010/Agricultural Engineering
Active registration: Year first registered/discipline:
Professional Engineer/Civil/TX #135433
Other experience and qualifications relevant to the proposed Project:
Samagra Rana is a civil engineer and has experience with hydrology and hydraulics analysis, infrastructure feasibility studies, stormwater management, design & drainage studies, geotechnical analyses, numerical forward and inverse models and remote sensing/GIS Techniques. He has applied his experience on watershed studies, dam assessments and repairs, flood protection plans and drainage master plans. He is currently involved in a variety of water resources projects and floodplain mapping.

PROFESSIONAL IN CHARGE OF PROJECT:

Name & Title:

Samagra Rana, PE - H&H Model Conversion

FEMA- APEX Rapid Response Flood Modeling. Project Engineer to assess InfoWorks ICM to compare the capabilities of four different 2D hydraulic modelling software to inform FEMA of their appropriateness for rapid local response to flood forecasting. The goal of this project was to determine the best available process to develop 2D hydrologic and hydraulic modeling and mapping for disaster response, considering time and cost parameters, credibility of modeling and mapping data produced by methodology, ability to produce data in 48 hours or less, and replicability of process for future use by FEMA and the disaster response community.

Federal Client, Probabilistic Flood Risk Assessment (PFRA) Continuous Innovation Initiative. Led a project team to apply PFRA analysis to the existing FEMA 2D BLE studies. Based on the investment made and to meet the PFRA standards, this project evaluates how the inventory of 2D BLE data may be transformed into probabilistic products, to potentially support the Future of Flood Risk Data initiative. Several representative 2D BLE models had incremental hydrologic and hydraulic enhancements, to identify how added consideration of uncertainty provides value in calculating risk.

Texas Water Development Board, 2D Base Level Engineering Studies. Responsibilities include planning and managing hydrological and hydraulic analysis for 12 HUC-8 watersheds in South East Texas. A separate model H&H analysis is performed for each HUC-8 watershed. The hydrological analysis includes local regression, TR-55, or gage analysis using Atlas 14. The hydrological analysis is completed with a combination of Python scripts and HEC-HMS. The 2D hydraulic model is developed using HEC-RAS that includes details such as roads, railways, population centers and various structures to satisfy FEMA standards.

City of Austin- North Acres Storm Drain Improvements and Design. Lead Project Engineer for designing and reviewing infrastructure feasibility alternatives for flood mitigation in Austin, TX using StormCAD and InfoWorks ICM. As a part of City of Austin, TX Capital Improvement Project, the flood improvements alternatives were designed in StormCAD and hydrological and hydraulic analysis was performed using InfoWorks ICM, HEC-HMS and HEC-RAS. Based on the flood complaint data, storm drain improvement alternatives were developed to reduce localized flooding and to meet the local drainage criteria. As part of the alternative development and preliminary engineering, supporting services included surveying, geotechnical considerations, utility investigations, environmental, roadway and traffic control.

Upper Brushy Creek Water Control Improvement District. Dam 21 Seepage Repairs Construction Manager to oversight and instruct the sub-contractor to comply with designed work as planned. Responsibility includes thorough understanding of design plans and dam functioning.

TxDOT- Mesa St. Drainage Study, City of El Paso, TX. Performed hydrological analysis for the ongoing project in Northwest El Paso, TX to mitigate flooding on SH-20 Mesa St. Responsible for delineation of watersheds, estimation of peak flows using Rational Method and HEC-HMS as specified.

TEC Professional Services Questionnaire

KEY PERSON, SPECIALIST, OR INDIVIDUAL CONSULTANT:
Name & Title:
Ben Pope, PE <i>Senior Associate, Flood Risk Solutions</i>
Project Assignment:
Stream Gauging/Calibration
Name of Firm with which associated:
AECOM Technical Services, Inc.
Years' experience with this Firm:
21
Education: Degree(s)/Year/Specialization:
BS/1988/Civil Engineering BS/1985/Physics
Active registration: Year first registered/discipline:
Professional Engineer, North Carolina #019297 Certified Floodplain Manager
Other experience and qualifications relevant to the proposed Project:
Ben Pope has more than 30 years of experience in all aspects of water resources. He has extensive experience in floodplain studies, statistical hydrology, watershed hydrology and modeling, and natural channel hydraulics. His extensive experience in statistical hydrology, watershed hydrology and modeling, and natural channel hydraulics provides a unique and thorough understanding the principles and practice of hydrology, including specific emphasis on hydrology for use in floodplain studies. Mr. Pope's software expertise includes the following: HEC-RAS, HEC-HMS, BRANCH Model, PEAKFQ, HSPF, ArcGIS, and USGS software and tools.

PROFESSIONAL IN CHARGE OF PROJECT:

Name & Title:

Ben Pope, PE - Stream Gauging/Calibration

NOAA Flood Severity Inundation Mapping. Louisiana, Alabama, Florida, Mississippi, Texas, North Carolina, Project Manager. Responsible for developing Methods and Standards for National Weather Service (NWS) Flood Severity Inundation Maps as well as map templates. Led inventory of topographic and engineering data at 524 NWS river forecast sites and development of geospatial database for the inventory data. Developed Flood Severity Inundation Maps at 35 selected NWS river forecast sites in the Gulf Coast region.

Hurricane Harvey Precipitation and Streamflow Frequency Analysis, FEMA HQ/Region VI - Texas/Louisiana. Mr. Pope led frequency analyses of precipitation and peak streamflow resulting from Hurricane Harvey, for the area impacted by Harvey. Mr. Pope directed the analyses of gage and radar derived precipitation data across 39 counties and of peak stream flow data from more than 50 stream gages in the same 39 counties. Mr. Pope and his team completed the analyses and delivered their preliminary report characterizing the annual exceedance probability of precipitation and flooding resulting from Hurricane Harvey 6 weeks after the Hurricane struck Texas.

North Carolina Flood Inundation Mapping and Alert Network (NC FIMAN), North Carolina Floodplain Mapping Program, North Carolina, Project Manager. Mr. Pope directed the development of flood inundation mapping for more than 50 USGS and ALERT stream gages. In addition he led the design and installation of 50 ALERT stream gages to augment spatial extent of NC FIMAN in western North Carolina.

First Order Approximation (FOA) Flood Studies for selected river basins in North Dakota and Wyoming. FEMA Region VIII. Mr. Pope led hydrologic analysis for First Order Approximation (FOA) flood studies of almost 7,000 stream miles in Stark and Williams Counties, ND; and in Goshen County, WY.

Jeddah Storm Water Drainage Program, Hydrologist. Led effort to define design rainfall parameters through analysis of available rainfall record. Developed rainfall intensity-duration-frequency curves for rainfall runoff modeling to determine stormwater system design flows. Developed rainfall inputs for dam rehabilitation design.

DFIRM Restudy and Update. Mecklenburg and Gaston Counties, NC, Lead Hydrologist. Mr. Pope developed a detailed statistical analysis of discharge data for the Catawba River to assist in the resolution of the appeal of the discharges previously used in both the Mecklenburg and Gaston County revised DFIRM maps.

North Carolina Floodplain Mapping Program, North Carolina. Lead Hydrologist. Developed methods and set standards for the hydrologic analysis phase of the project, Mr. Pope has performed or directed hydrologic analyses for 11 river basins, totaling over 40,000 sq. mi. of drainage area.

South Carolina Department of Natural Resources, Flood Map Modernization, Statewide, South Carolina, Lead Hydrologist. As lead hydrologist and senior engineer Mr. Pope is responsible for determining appropriate methods and setting standards for hydrologic analysis. Oversees quality assurance/quality control of hydrologic analyses, provides technical guidance, and leads analyses for hydrologic analysis of non-standard or unusual conditions such as analysis of the Congaree River in Richland County.

TEC Professional Services Questionnaire

KEY PERSON, SPECIALIST, OR INDIVIDUAL CONSULTANT:
Name & Title:
Ryan Koenig, PE <i>Project Manager, Civil/Structural Engineer</i>
Project Assignment:
Engineering Support
Name of Firm with which associated:
AECOM Technical Services, Inc.
Years' experience with this Firm:
19
Education: Degree(s)/Year/Specialization:
BSc/1995/Biology BSc/1999/Civil Engineering
Active registration: Year first registered/discipline:
Professional Engineer/Civil/LA #0031036
Other experience and qualifications relevant to the proposed Project:
Mr. Koenig is a civil/structural engineer and project manager with more than 20 years of expertise in design and project management, including levees, flood protection structures, concrete and steel hydraulic structures, pumping stations, buildings, marine structures, and flood walls. He has managed several large USACE projects and brings experience in all phases of engineering and construction projects, including conceptual design, permitting, final design, shop drawing review, field inspection, and project and construction management. He also has extensive ECI (CMAR) and Design Build experience.

PROFESSIONAL IN CHARGE OF PROJECT:

Name & Title:

Ryan Koenig, PE - Engineering Support

Mississippi River Diversion into Maurepas Swamp, St. John the Baptist Parish, LA (Coastal Restoration Division Louisiana Department of Natural Resources), Structural Engineer. Served as Lead Engineer for the design of three (3) 9' x 9' box culverts crossing that will cross under Airline Highway, the Kansas City Southern (KCS) Rail Line, and the Illinois Central (IC) Rail Line. Responsible for oversight of production of plans and specifications, cost estimates, and all other structural design aspects.

Mid-Barataria Sediment Diversion, LA CPRA, Belle Chasse, LA. Deputy Project Manager. Deputy Project Manager and Civil/Structural Engineer for the Mid Barataria Sediment Diversion Project, which will divert 75,000 cfs of sediment-laden Mississippi River water into Barataria Basin for the purpose of building new land within an eight-mile radius of the diversion's outfall over 50 years. The project is currently in the 30%-design phase, and the design is scheduled to be completed and construction to begin in 2021. The project is being executed under a Construction-Manager-at-Risk (CMAR) contract structure, and the E&D is being performed in a collocated office in Baton Rouge to facilitate ongoing collaboration among the AECOM Team, the CMAR, and CPRA.

USACE New Orleans District, Permanent Canal Closures & Pump Stations, New Orleans, LA. Lead Structural Review Engineer. Lead Structural reviewer and Deputy Team lead for Design Quality Assurance Team (DQA), assisting the USACE in reviewing the contractor's design for contractual conformance for this fast paced, \$615 mil design-build project that includes pumping stations, floodwalls, and levees. Also reviewed construction submittals and RFI's.

USACE Memphis District, Engineering and Design of Levee Enlargement Reach LPV 111, New Orleans, LA, Civil Engineer. Developed multiple design packages to facilitate the contractor's proposed schedule and means and methods for this large levee project which included deep soil mixing. Managed coordination with owner and contractor, as well as production of multiple P&S packages to allow for early construction activities.

Hurricane & Storm Damage Risk Reduction Reach LPV 105, New Orleans, Louisiana. Civil Engineer/Project Manager. Project Manager for the Lakefront Airport Floodwall project consisting of over 1 ½ miles of reinforced concrete floodwall, I -wall, and levee adjacent to the New Orleans lakefront Airport. Responsible for overall project management including production of plans and specifications, design reports, cost estimates and schedules, and other ancillary design items.

USACE, New Orleans District, Southeast Louisiana Urban Flood Control Project, Louisiana Avenue Improvements (Constance Street to South Claiborne Avenue), (USACE, New Orleans District), Orleans Parish, LA. Served as Project Manager and lead Structural Engineer for roadway improvements to Louisiana Avenue, where a new box culvert being installed to increase drainage capacity for the S&WB. Responsible for the progress of all design work, client contacts, coordination of sub contractor activities, and coordination with utilities and other entities, including the City of New Orleans Department of Public Works, the Sewerage and Water Board of New Orleans and the Regional Transit Authority. Mr. Koenig was also responsible for overall project management and oversight of production of plans and specifications, cost estimates, and all other design aspects. Currently performing engineering during construction including submittal reviews, site visits, and RFI responses.

TEC Professional Services Questionnaire

PROFESSIONAL IN CHARGE OF PROJECT:
Name & Title:
Greg France, PE <i>Civil Engineer</i>
Project Assignment:
Utilities Research
Name of Firm with which associated:
AECOM Technical Services, Inc,
Years' experience with this Firm:
11
Education: Degree(s)/Year/Specialization:
BS/2010/Civil Engineering
Active registration: Year first registered/discipline:
Professional Engineer, LA #0041249
Other experience and qualifications relevant to the proposed Project:
Greg has experience in construction management; levee design, construction and inspection; pump station and floodwall inspection; hydrologic and hydrographic modeling; bridge scour countermeasure design; bridge inspection; and roadway drainage design.

PROFESSIONAL IN CHARGE OF PROJECT:

Name & Title:

Greg France, PE - Utilities Research

Plaquemines Parish Government (PPG), WBV-09a, Hero Canal to Oakville Levees, and WBV-12, Hero Canal Reach 1, Plaquemines Parish, Louisiana. Performed construction management duties such as engineering review during construction, revising plans and specs as necessary, reviewing and issuing contract modifications, reviewing contractor submittals, performing site inspections, reviewing testing documentation and performing project closeout duties. Also coordinated with PPG, USACE, and CPRA.

CPRA, Extension of Staff Services to Support CPRA for the New Orleans to Venice Flood Protection Improvements, Plaquemines Parish, Louisiana. Reviewed plans, specs and technical reports during design of levees, floodwalls and pump stations; performed construction site visits; attended construction progress meetings and milestone inspections; reviewed modifications, requests for information, and submittals; reviewed construction as-builts prior to USACE turnover to the local sponsor; and provided additional engineering support as requested by PPG and CPRA.

PPG, NOV-NF-W-05 (La Reussite to Myrtle Grove) and NOV-NF-W-06 (Myrtle Grove to St. Jude) Interior Drainage Canal Relocation, Plaquemines Parish, Louisiana. Assisted with the development of hydrologic and hydraulic models, setting up drawings for plans, and conducted site visits to assess the existing conditions.

CPRA, River Reintroduction Into Maurepas Swamp and West Shore Lake Pontchartrain Flood Risk Reduction, St. John the Baptist Parish, LA. Performed utility relocation coordination which includes compiling available utility and pipeline data and coordinating the relocations with the utility and pipeline owners.

CPRA, Mid-Barataria Sediment Diversion, Plaquemines Parish, LA. Led the production of Right-of-Way Plans. Assisted with plan technical reviews. Evaluated, alternative back levee designs and performed a life cycle cost analysis for each alternative. Assisted with the development of a wick drain test plan for the diversion channel guide levees.

U.S. Army Corps of Engineers, New Orleans District (USACE-MVN), Morganza to the Gulf Periodic Levee Inspection. Performed a walking inspection of approximately 90 miles of back levee of the Morganza to the Gulf Levee System.

Mississippi Department of Transportation (MDOT), US 61 Over Buffalo River and Sandy Creek, Scour Countermeasures, Wilkinson County, Mississippi. Assisted with the bridge scour countermeasure design for US 61 over Buffalo River and Sandy Creek. Led the production of plans for the preliminary right-of-way submittal.

MDOT, I-20 Eastbound Bridge at I-55 South, Hinds County, Mississippi. Assisted with highway hydraulic design, including hydrology, channel, culverts, energy dissipaters, and storm drainage systems in accordance with the MDOT Roadway Design Manual and other applicable laws. Also assisted with the production of plans and specs.

USACE, FPV03 Floodwalls and Levees, Old River North, Old River South and Tide Gate, Freeport, TX. Performed preliminary modeling and design for the Old River North levee and floodwalls.

TEC Professional Services Questionnaire

KEY PERSON, SPECIALIST, OR INDIVIDUAL CONSULTANT:
Name & Title:
Shannon Landry, PMP, CCM, CEP <i>Project Manager/Project Controls</i>
Project Assignment:
Project Controls/Cost Estimator/Scheduling
Name of Firm with which associated:
AECOM Technical Services, Inc.
Years' experience with this Firm:
13
Education: Degree(s)/Year/Specialization:
MBA/2003 BS/1986/Secondary Education
Active registration: Year first registered/discipline:
Project Management Professional #525591, National, 2008 Certified Construction Manager #1315, 2014, National Licensed Commercial Contractor, AECOM QP, LA #24503, 2017; Licensed Mold Inspection/Remediation Contractor AECOM QP LA #250686, 2017; CEP AACE #00481, 2019; PSP AACE #02155; 202
Other experience and qualifications relevant to the proposed Project:
Ms. Landry has 30 years of experience in project and program management with expertise in Project Controls, Cost Estimating & CPM Schedules / network analysis of private / public / Federal / regulated utility projects including FEMA Public Assistance, Hazard Mitigation Grant Programs, vertical construction and roadway projects and dispute resolution. She has in-depth experience in project controls resulting in synergies across project scheduling, cost estimating, and construction management. This routinely leads to client cost savings in project management and litigation / dispute resolution environments.

PROFESSIONAL IN CHARGE OF PROJECT:

Name & Title:

Shannon Landry, PMP, CCM, CEP - Project Controls/Cost Estimator/Scheduling

Louisiana Coastal Protection & Restoration Authority, Lower Breton Sound Diversion, Bohemia, LA, Cost Estimator. Developed a planning phase Cost Estimate using MCACES. The project value was estimated at \$350 to \$500 million. Cost estimate prepared was used as primary basis for diversion site selection on the east side of Mississippi River in Plaquemines Parish, Louisiana.

Hazard Mitigation Grant Program, New Orleans Sewerage & Water Board, New Orleans, LA, Project Controls / Construction Management. Ms. Landry provides independent Project Control Management of the Hazard Mitigation Grant Program and developed a Master Schedule to facilitate completion of turbine generator rehabilitation. She advises Executive Staff as requested about construction progress, change requests and time extensions / delay claim validity.

US Army Corps of Engineers New Orleans District, Storm proofing of Interior Pump Stations, New Orleans LA, Project Controls / Construction Management / Estimate Review. The assignment involved construction of "Storm proofing" by strengthening early 20th century masonry-constructed pump stations using masonry enhancement bars, spiral wall ties and grout injection while keeping all pump stations fully operational. Program is comprised of 14 different projects across metropolitan pump stations. As a member of the Construction Management Team, she performed construction phase cost, schedule review and program schedule development as Owner's Representative using M-CACES and other estimating software as required. Performed CPM schedule review using Primavera P6, Suretrak and Microsoft Project software. She evaluated contractor modification estimates of costs that varied from 500k to +/- \$10 million. She provided Owner Representation services in the areas of cost and schedule.

US Army Corps of Engineers New Orleans District, Hurricane & Storm Damage Risk Reduction System, New Orleans, LA, Project Controls / Modification Cost Review. Ms. Landry performed design phase cost, schedule review and program schedule development using M-CACES Primavera P6, Suretrak and Microsoft Project. Evaluated Contractor Modification estimates of costs. All projects were delivered on time and within budget. She provided Owner Representation services in the areas of cost and schedule during the construction phase. The HSDRRS includes five parishes and consists of 350 miles of levees and floodwalls; 73 non-Federal pumping stations; 3 canal closure structures with pumps; and 4 gated outlets. The program utilized EPC, Best Technical Approach, and Early Contractor Involvement (ECI) to deliver program scope.

Hurricane Protection Office, US Army Corps of Engineers New Orleans District, New Orleans Louisiana Hurricane and Storm Damage Risk Reduction System Orleans & St. Bernard Parishes, LA, Program Scheduler / Construction Management / Modification Cost Review / Dispute Resolution. As a member of the Construction Management Team, she performed design phase cost, schedule review and Program Schedule development using M-CACES Primavera P6, Suretrak and Microsoft Project. Evaluated contractor modification estimates of costs. Performed project site construction management as requested by Command as Owners Representative. Modification costs varied between 500k and +/- \$10 million. All projects were delivered on time and within budget. The program utilized EPC, Best Technical Approach, and Early Contractor Involvement (ECI) to deliver program scope. The HSDRRS includes the two parishes which flooded and held water following Hurricane Katrina. Construction included multiple flood walls, levees and pump station modifications. Ms. Landry provided Owner Representation services in the areas of cost and schedule during the construction phase.

TEC Professional Services Questionnaire

KEY PERSON, SPECIALIST, OR INDIVIDUAL CONSULTANT:
Name & Title:
Marisa Mason Associate Vice President, HUD Policy and Programs Advisor
Project Assignment:
Grant Research Coordination LWI/CDBG/Federal
Name of Firm with which associated:
AECOM Technical Services, Inc
Years' experience with this Firm:
9
Education: Degree(s)/Year/Specialization:
Coursework-Environmental Studies
Active registration: Year first registered/discipline:
N/A
Other experience and qualifications relevant to the proposed Project:
Marisa has spent the past than 14 years serving communities following major disasters. Her experience spans across all levels of government; whether working for or alongside the Federal Emergency Management Agency (FEMA), the Department of Housing Urban Development (HUD), State governments, or local jurisdictions in large cities and rural communities. Having dedicated her career to disaster response and long-term recovery, she has gained an invaluable understanding of the development of complaint federal programs, on the ground operations, conducting community outreach, and interpreting and applying federal and local regulations, all with a critical but empathetic eye. Driving for community recovery through disaster programs has given her the ability to understand the needs of complex projects at various levels and push them forward to success. She has extensive applied knowledge as it relates to quality control and monitoring, development of and training on processes for large scale disaster recovery programs, federal grant funding research, government regulation interpretation and application, and disaster mobilization planning.

PROFESSIONAL IN CHARGE OF PROJECT:

Name & Title:

Marisa Mason - Grant Research Coordination LWI/CDBG/Federal

Hurricane Matthew Resilient Redevelopment Plans, North Carolina Emergency Management. Ms. Mason served as a resilient planner leading a planning team during the development of Resilient Redevelopment Plans for North Carolina. These plans were focused on the development of potential recovery projects in each of the North Carolina counties impacted by Hurricane Matthew. The projects included in the Resilient Redevelopment Plans that were identified through extensive community meetings and were designed to address resilience within four key community elements: Housing, Infrastructure, Business Development, and Environment. Projects were crafted and revised with community input, then evaluated for practicability and compliance with applicable guidance and regulations.

Federal Emergency Management Agency (FEMA) - Intergovernmental Affairs Officer. Ms. Mason worked closely with city, county, and state government officials to keep them apprised of new FEMA guidance or upcoming programs, coordinated with the State of Texas to ensure FEMA guidelines were met prior to grant awards, assisted senior staff in making educated policy decisions, and compiled reports to bring awareness to ongoing issues in the disaster response, assistance, and recovery arena.

State of Texas General Land Office - Grant and Project Management. Responsible for overall grant and contract management for large Disaster Recovery Programs such as the City of Houston, Harris County, the Houston-Galveston Area Council, Montgomery County and Bastrop County. Management activities included but were not limited to drafting Program Guidelines and Policy; assisting subrecipients with Program planning; contract scope and financial management as it relates to budget modifications, scope amendments, overall program technical assistance, and training case management and eligibility determination teams on Duplication of Benefits (DOB) and program eligibility.

State of Texas General Land Office & Texas Dept. of Housing and Community Affairs - Disaster Recovery Grant Compliance Specialist. Developed audit and monitoring scopes and objectives based on program procedures and deliverables; performed audits and monitoring assignments of CDBG DR subrecipients as well as provided oversight and guidance to others in their auditing assignments; conducted in-depth desk and on-site reviews to verify accuracy and compliance with contracts, federal and state regulations, accounting practices and program requirements; verified the allowability and reasonableness of program expenses under all applicable conditions of grant award; prepared and reviewed monitoring reports which address findings of non-compliance, required corrective actions and recommendations for all contracts reviewed; advised agency officials on contract administration problems and technical phases of projects.

Housing Authority of the City of Austin (HACA), TX, Emergency Action Plan and Business Continuity Plan, Project Manager. Responsible for the development of a comprehensive Emergency Action Plan that addresses the current threats and risks facing public facilities such as flooding, fire, and active shooter scenarios; providing training for HACA staff on the new Emergency Action Plan; oversight and review of the creation of HACA's Business Continuity Plan; coordinating and facilitating a Threat and Vulnerability Assessment of HACA's headquarters building; coordination of an Active Shooter drill in tandem with the Austin Police Department and HACA.

TEC Professional Services Questionnaire

KEY PERSON, SPECIALIST, OR INDIVIDUAL CONSULTANT:
Name & Title:
Roy Knowles, PWS <i>Environmental Planning Manager</i>
Project Assignment:
Water Quality BMP (Environ./Permitting)
Name of Firm with which associated:
AECOM Technical Services, Inc.
Years' experience with this Firm:
28
Education: Degree(s)/Year/Specialization:
MS/1989/Wildlife and Fisheries Sciences BA/1982/Finance
Active registration: Year first registered/discipline:
Professional Wetland Scientist
Other experience and qualifications relevant to the proposed Project:
Mr. Knowles is a certified professional wetland scientist with 31 years of experience in wetland identification and delineation. He possesses a comprehensive knowledge of current U.S. Army Corps of Engineers (USACE) regulations and permitting issues relative to jurisdictional waters of the United States, and an extensive background in data collection, field investigation, document preparation, and agency interface related to wetland delineations, threatened and endangered species evaluations, and coordination of federal permits required under Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act. He also has experience in the preparation and coordination of environmental assessment and environmental impact statement documents as required by the National Environmental Policy Act (NEPA).

PROFESSIONAL IN CHARGE OF PROJECT:

Name & Title:

Roy Knowles, Water Quality BMP (Enviro/Permitting)

Brazos River Bank Stabilization, Fort Bend County, Texas. Task lead for the delineation of the ordinary high water mark and wetlands along a segment of the Brazos River impacted by erosion from Hurricane Harvey. Responsible for U.S. Army Corps of Engineers coordination relative to permit authorization for the proposed bank stabilization activities.

New Storm Water Pump Station, Fort Bend County, Texas. Task lead for the identification and delineation of waters of the United States on the site of a new storm water pump station and the channels adjacent to the site. Responsible for U.S. Army Corps of Engineers coordination relative to permit authorization for the intake and outfall structures and associated bank stabilization for the proposed pump station.

61st Street Boat Ramp, Galveston, Texas. Task lead responsible for the preparation, coordination, and time extension of a Department of the Army individual permit for the repair/rehabilitation of an existing public boat ramp and adjacent recreational area. Task lead responsible for the preparation and coordination of a U.S. Coast Guard bridge permit required for the construction of a pedestrian bridge over Offatts Bayou connecting the boat ramp and recreational area. Also responsible for the preparation of a U.S. Coast Guard-required environmental document supporting the bridge permit application.

Bexar County Flood Control Capital Improvement Program, San Antonio, Bexar County, Texas. As Technical Lead (Professional Wetland Scientist), provided technical direction to staff and subconsultants. Provided wetlands and stream assessment strategy; set standards for requirements for technical submittals to resource and regulatory agencies; reviewed and provided comment and direction for Section 404 issues including minimizing and avoiding impacts to streams, riparian habitat, water quality, and threatened and endangered species. Reviewed and developed materials for Section 404 permitting and compensatory mitigation planning, provided guidance to staff on permitting and environmental compliance issues, and contributed to USACE negotiations to achieve project permitting.

Final Environmental Impact Statement, SH 99 (Grand Parkway), Segment B, Brazoria and Galveston Counties, Texas. Environmental task lead responsible for the preparation of the Final Environmental Impact Statement for an approximately 20-mile segment of SH 99. The project involved evaluation of multiple alternative alignments within a primarily rural study area encompassing approximately 170 square miles. The Record of Decision was executed in November 2016.

Luce Bayou Interbasin Transfer Project, Harris and Liberty Counties, Texas. Task lead for the identification and delineation of waters of the United States along a 26-mile canal/pipeline corridor and a 3,000-acre compensatory mitigation site, which was subsequently deeded to the U.S. Fish and Wildlife Service. Responsible for the preparation and coordination of a Department of the Army individual permit application for the project corridor and mitigation site. Assisted with the preparation of an environmental impact statement to support the permit application.

SH 99 (Grand Parkway), Segment I-2, Harris and Chambers Counties, Texas. Task lead responsible for the identification and delineation of waters of the United States within the right-of-way of a 12-mile segment of SH 99 in Harris and Chambers Counties. Project involved Department of the Army permitting for impacts to waters of the United States and preparation of a U.S. Coast Guard bridge permit application.

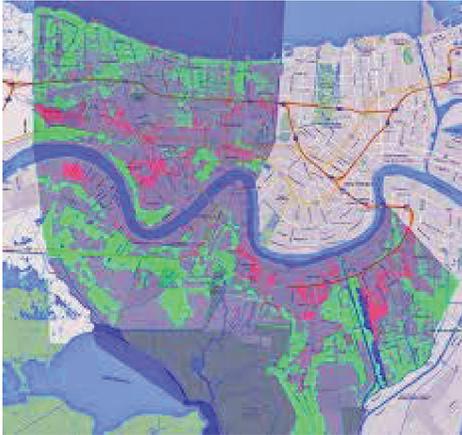
L. Work by Firm or Joint-Venture members which best illustrates current qualifications relevant to this Project. Please include any and all work performed for Jefferson Parish. Please attach additional pages if necessary.

PROJECT NO. 1

Project Name, Location and Owner's contact information:	Nature of Firm's Responsibility:	
<p>Westbank Master Drainage Plan and Update <i>Jefferson Parish, LA A</i> Mr. Mitch Theriot 1221 Elmwood Park Blvd. Jefferson, LA 70123 504.736.6833</p>  <p>AECOM led the 1st Jefferson Parish West Bank Master Drainage Plan</p>	<p>This project involved a complete hydrologic and hydraulic study of approximately 36,000 acres of the West Bank of Jefferson Parish. The work included detailed topographic mapping of the entire study area, review of past studies, and assimilation of data on existing drainage facilities in the area. Hydrologic and hydraulic analyses of the eight major drainage basins included determination of applicable rainfall and run-off criteria and values, storm modeling of existing and improved drainage and pumping facilities in the area. This work was performed utilizing the EPA developed Storm Water Management Model (SWMM) computer program and the U.S. Army Corps of Engineer's HEC-2 computer program. AECOM produced fully electronic flood maps indicating flow line and elevations for each node of the model. These maps along with the model were subsequently updated for the Parish for existing conditions, a 100-year frequency event and a 500-year frequency storm event and the Parish in-turn provided these maps to FEMA</p> <p>Individual Modeling Tasks for the project included:d:</p> <ul style="list-style-type: none"> • Input of topographic data, cross sections and elevations using contour maps and survey data • Determination of basin limits • Configuration of pumping routines and operations • Configuration of storage areas • Weir configuration input • Network configuration • Storm hyetograph input • System modeling 	
<p>Completion Date (Actual or estimated):</p>	Estimated Cost:	
	Entire Project:	Work for which Firm was Responsible:
<p>2009</p>	<p>\$1.8M</p>	<p>\$1M</p>

L. Work by Firm or Joint-Venture members which best illustrates current qualifications relevant to this Project. Please include any and all work performed for Jefferson Parish. Please attach additional pages if necessary.

PROJECT NO. 2

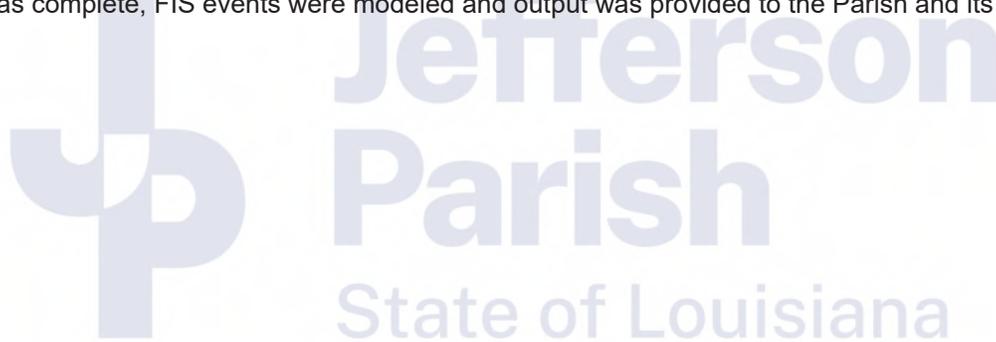
Project Name, Location and Owner's contact information:	Nature of Firm's Responsibility:	
<p>East Bank Drainage Master Plan (Basis of FEMA Effective Study) <i>Jefferson Parish, LA</i></p> <p>Mitchell Theriot 1221 Elmwood Park Blvd, Jefferson, LA 70123 504.756.6512</p>  <p>AECOM led the Jefferson Parish DFIRM Effort</p>	<p>AECOM provided modeling services to identify the current floodplain limits within portions of the Parish inside the hurricane levees. The hydrologic and hydraulic modeling for the 115 square-mile area hurricane protection system (HPS) included pump station and canal system improvements, and allowed FEMA digital flood insurance rate maps (DFIRM) to be created.</p> <p>Property that is outside the new floodplain designation would no longer be required to carry flood insurance or would pay substantially reduced rates for coverage.</p> <p>Hydraulic Model Selection Phase. The first phase of the DFIRM project consisted of selecting the hydrologic and hydraulic models to be used. The hydrologic model used to develop the Jefferson Parish DFIRMs was selected based on the characteristics of the watershed, the existence of previous models, and the acceptability under FEMA requirements. It was determined that the hydrologic model for the project must include the following capabilities:</p> <ul style="list-style-type: none"> • Model single event based storms, • Compute runoff hydrographs that could be linked to the hydraulic model, • Model multiple hydrologic methods, and • Link with GIS data layers. <p>Based on the interconnected canals and pump stations within the watersheds, it was determined that a one-dimensional, unsteady flow hydraulic model would adequately model the dynamic flow conditions of Jefferson Parish. The HEC-RAS software was selected as the ideal model for developing the Jefferson Parish DFIRMs. There were many advantages to using the HEC-RAS model for Jefferson Parish. A First, the model was accepted by FEMA, and supported by HEC. In addition, HEC agreed to adopt Jefferson Parish as a test case for the development and testing of the HEC-RAS 4.0 beta software product. The HEC-RAS beta was intended to include advanced pump system and closed conduit routines that would aid in the modeling of Jefferson Parish's urban network.</p>	
Completion Date (Actual or estimated):	Estimated Cost:	
	Entire Project:	Work for which Firm was Responsible:
2006	\$1M	\$209K

Nature of Firm's Responsibility:

Hydraulic Modeling Phase. The hydrologic and hydraulic models cover a total area of 115 sq-mi and are divided into six (6) basins based on the HPS, thus resulting in six separate pairs of hydrologic and hydraulic models. The basins include urbanized and low-lying marsh areas, though certain basins are almost entirely urbanized. In total, the models include 27 major pump stations and a network of approximately 220 miles of open and closed canals with nearly 775 bridges, culverts and pipe crossings.

The Jefferson Parish FEMA FIS began in 2001, and by 2005 all data had been collected and the models had been developed. During this period, existing models were converted to HEC-HMS and HEC-RAS, additional surveys of canals were performed and site visits were conducted to identify bridge and culvert structures. While some modeling had begun by 2005, the bulk of the modeling had not yet been performed. On August 29, 2005, Hurricane Katrina made landfall, resulting in a compromise of New Orleans' HPS. As a result, the USACE formed the Interagency Performance Evaluation Taskforce (IPET) to determine the behavior and causes of damage to the HPS.

AECOM joined the IPET in January 2006 as a member of the Interior Drainage and Analysis Team, led by the USACE HEC, and temporarily suspended work on the FEMA FIS modeling. AECOM updated and improved the existing Jefferson Parish DFIRM models in order to reproduce Jefferson Parish's interior flooding from Hurricane Katrina. Following the public release of the draft PET report in June 2006, AECOM resumed work on the FEMA FIS modeling. In order to provide the Parish with the most reliable, accurate and up to date models, the pre-Katrina DFIRM models were superseded by the updated PET models. The models were then run for the FIS historic calibration and verification events. Once calibration and verification was complete, FIS events were modeled and output was provided to the Parish and its GIS consultant.



L. Work by Firm or Joint-Venture members which best illustrates current qualifications relevant to this Project. Please include any and all work performed for Jefferson Parish. Please attach additional pages if necessary.

PROJECT NO. 3

Project Name, Location and Owner's contact information:	Nature of Firm's Responsibility:	
<p>Louisiana Avenue Regional Detention Basin <i>Lake Charles, LA</i></p> <p>Calcasieu Parish Police Jury Terry Frelot and Garry Johnson 1015 Pithon Street, Second Floor Lake Charles, LA 70602 337-721-3500</p>	<p>Calcasieu Parish Police Jury (CPPJ) proposes to construct a regional wet-bottom detention basin on an approximately 18.6-acre undeveloped tract of land located in Lake Charles, Calcasieu Parish, Louisiana. AECOM performed a hydrologic and hydraulic (H&H) assessment to verify that the size and location of the basin would provide significant relief both locally and regionally. This effort was documented in an H&H report. Once the benefits were confirmed, AECOM began the design effort, to be followed up by both bid and construction phase assistance.</p> <p>The basin contains an intake structure and 3 outfall pipes located on the northern boundary of the, along the southern bank of Contraband Bayou. The intake structure will direct storm water from Contraband Bayou into the detention basin when storm flows reach an elevation of 7.9 feet North American Vertical Datum of 1988 (NAVD88). The outfall structure would direct detained floodwater from the basin back into Contraband Bayou through three 24-inch diameter corrugated aluminum pipes. The outfall pipes can be remotely controlled using CPPJ's SCADA system, that will raise and lower gates to block flow.</p> <p>The basin will have an asphalt perimeter trail and will have perimeter fencing. A 10-foot wide safety shelf will be constructed in the interior of the basin. Recreational features including mature trees, wetland plants at the water fringe, trash receptacles, and park benches will be included around the basin.</p> <p>AECOM performed H&H modeling to determine and confirm the level of impacts for the proposed hydraulic improvements from the detention basin. Various storm events were analyzed to confirm this proposed location and size indeed provided a regional benefit.</p>	
<p>Completion Date (Actual or estimated):</p>	Estimated Cost:	
	Entire Project:	Work for which Firm was Responsible:
<p>2021</p>	<p>\$5.5M</p>	<p>\$950K</p>

L. Work by Firm or Joint-Venture members which best illustrates current qualifications relevant to this Project. Please include any and all work performed for Jefferson Parish. Please attach additional pages if necessary.

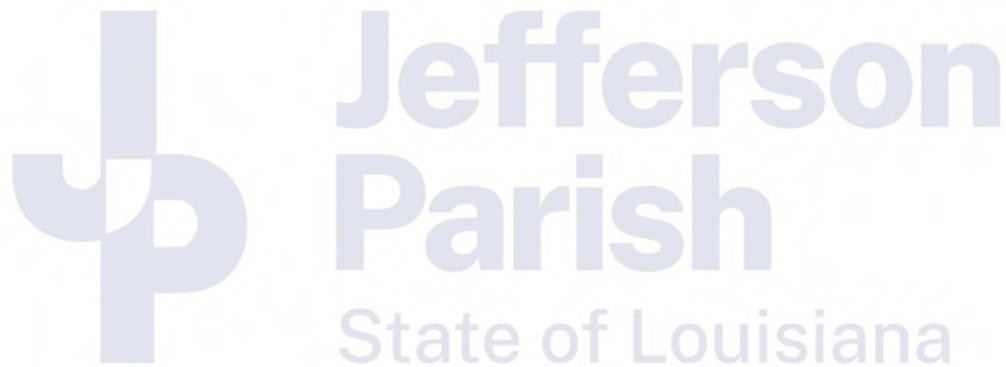
PROJECT NO. 4

Project Name, Location and Owner's contact information:	Nature of Firm's Responsibility:	
<p>Louisiana Watershed Initiative (including Jefferson Parish's East and West Banks) Coastal Louisiana</p> <p>Louisiana Office of Community Development LaKesha Hart 225.342.1948 Lakesha.Hart@la.gov</p>    <p><i>Managing future flood risk in Louisiana through watershed-based solutions</i></p>	<p>AECOM is managing a \$1.2B HUD-funded program that will ultimately entail a fundamental transformation as to how water resources in Louisiana are managed (i.e., movement from a geo-political basis to a watershed basis). As part of this effort, AECOM is performing an extensive analysis of Federal, state and local laws, programs and policies; determining obstacles and opportunities for revising approaches to water resources management; developing a conceptual framework for the evaluation of NBS and conventional projects; and supporting multiple Louisiana Watershed Initiative (LWI) entities including an NBS Committee.</p> <p>AECOM is providing the Louisiana Office of Community Development with a range of professional and technical management services in support of a \$1.2B HUD-funded program to fundamentally realign management of Louisiana's water resources from a geo-political to a watershed basis. Central to this effort is a range of services to support the selection, design and construction of hundreds of coastal and riverine projects for the purpose of flood mitigation and prevention. Conventional and NBS projects will receive an equal, unbiased focus during the project selection process. NBS is a key component of the Louisiana Watershed Initiative (LWI) overall and is the focus of a five agency NBS Committee actively working (with AECOM support) to incorporate NBS into the mix of projects for construction. The LWI is expected to be underway for an 8-10-year period with the AECOM Team providing critical support services over that period.</p> <p>AECOM services to date have included approximately 12 task orders that include research and development of a Statewide Master Plan for water resources; a guidance document to align multiple state agencies (e.g., policies, procedures, regulations) with the LWI technical and managerial support for the state's NBS Committee, a State Watershed Council, a Working Group and multiple Technical Advisory Groups; coordination of modeling procedures and protocols across eight watersheds statewide (all being modeled by different consultants); data management coordination (including institutional and technical analysis); economic analysis of project applications (NBS and conventional projects) and development of an "Everything Flooding Related Portal" a one stop website for use by both the technical and stakeholder communities to assist with LWI implementation. The latter will feature NBS projects and data repositories to advance the design, construction, and evaluation of NBS projects.</p>	
Completion Date (Actual or estimated):	Estimated Cost:	
	Entire Project:	Work for which Firm was Responsible:
2023	\$2.1M	\$1M (annually)

PROJECT NO. 4 *continued*

Nature of Firm's Responsibility:

Providing a foundation for the above-noted services is extensive AECOM analysis of Federal, state and local laws, programs and policies; a determination of obstacles and opportunities for a watershed-based approach to water resources management; and the development of an NBS Committee to address them. Additionally, AECOM's nationwide experience and expertise in this area has been relied up to provide multiple case studies, best practices and lessons learned to inform the design, selection, implementation and evaluation of hundreds of flood mitigation projects from economic, engineering and effectiveness basis, with careful consideration of NBS alternatives.



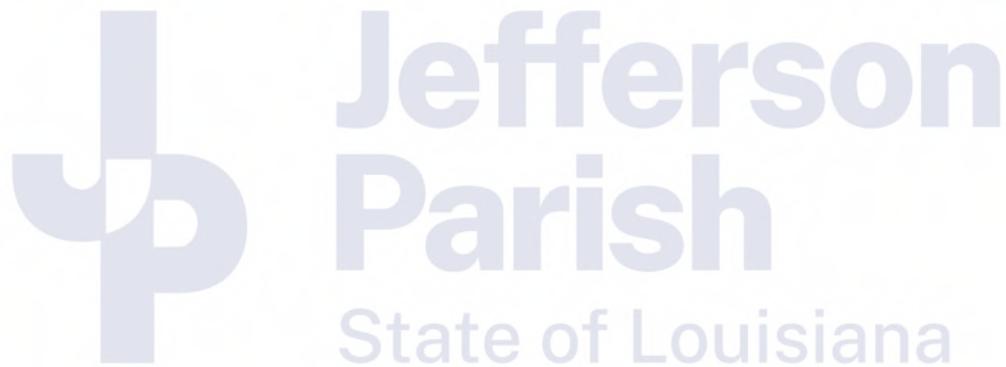
L. Work by Firm or Joint-Venture members which best illustrates current qualifications relevant to this Project. Please include any and all work performed for Jefferson Parish. Please attach additional pages if necessary.

PROJECT NO. 5

Project Name, Location and Owner's contact information:	Nature of Firm's Responsibility:	
<p>Mid-Barataria Sediment Diversion Project Area Wide Drainage Model <i>Plaquemines Parish, LA</i> Coastal Protection and Restoration Authority Brad Barth, PE - Operations Assist Administrator Phone: 225.342.4553</p>    <p>AECOM is leading North America's largest Construction Management at Risk (CMAR) project</p>	<p>AECOM is engineering and designing for LA CPRA the Mid-Barataria Sediment Diversion Project (MBSD) in Plaquemines Parish near Myrtle Grove. The diversion will reconnect the Mississippi River to the Barataria Basin, but in so doing, will sever the West Bank of Plaquemines Parish. The existing network of drainage ditches collect and convey surface stormwater runoff from north to south and across the diversion's conveyance channel alignment to the Wilkinson Pumping Station, which discharges the stormwater runoff into Barataria Basin. The water surface elevation of the diverted river flow, however, will be higher than the surrounding grade, so the diversion's conveyance channel will be confined by guide levees and prevent the conveyance of stormwater runoff across the diversion's footprint. An engineered solution looking at area-wide drainage impacts was needed.</p> <p>During an engineering alternatives analysis phase, AECOM investigated two potential modifications to the drainage network to handle the stormwater runoff on the diversion's north side. They were a new drainage pumping station sited north of the diversion and an inverted siphon pipe bank to convey stormwater across the diversion. AECOM first constructed an area-wide non-steady-state HEC-RAS model and calibrated it to historic gage readings at the pumping station for certain storm events. Topographical survey data consisted primarily of existing LiDAR data, supplemented by ground shots AECOM took. AECOM confirmed the accuracy of the LiDAR data by comparing it to ground spot elevations. AECOM then separately inserted the proposed infrastructure into the model as well as the USACE's proposed New Orleans to Venice Levee and its drainage modifications and determined the required flow capacity was approximately 750 cfs. AECOM next developed feasibility-level designs and life cycle cost estimates of the pumping station and inverted siphon. Based on these cost estimates, AECOM recommended the inverted siphon bank, which CPRA accepted</p>	
<p>Completion Date (Actual or estimated):</p>	<p>Estimated Cost:</p>	
	<p>Entire Project:</p>	<p>Work for which Firm was Responsible:</p>
<p>2023</p>	<p>\$1.2B</p>	<p>\$42M</p>

Nature of Firm's Responsibility:

AECOM then developed a detailed design of the siphon bank. Stream gages were installed at three locations to more accurately calibrate and validate the area-wide drainage model. The model was further developed by adding valves at the siphon pipes inlet structures in order to develop an operations procedure for the siphon pipes to incrementally flow at a sufficient cleaning velocity without causing unacceptable upstream ponding. A new gate structure was also added to the USACE's proposed New Orleans-to-Venice non-federal levee reach for draining stormwater that would be impounded by the construction of the proposed levee reach and the diversion's north guide levee. The siphon pipes and the drainage structure culvert size were adjusted again so that the proposed drainage system modifications did not raise the stormwater surface elevations more than 0.1 feet. Geotechnical, civil/site and structural designs of the siphon bank components currently are at a 60%-level of completion, with final engineering scheduled for completion in summer, 2022. The proposed drainage modifications will be reviewed by the parish, CPRA, and the USACE as part of the CUP/Section 404/Section 10 Joint Permit Application.



L. Work by Firm or Joint-Venture members which best illustrates current qualifications relevant to this Project. Please include any and all work performed for Jefferson Parish. Please attach additional pages if necessary.

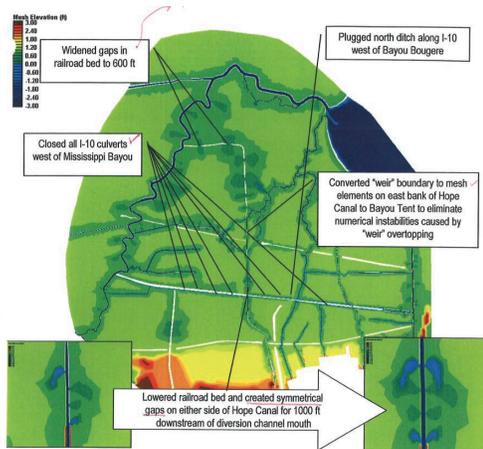
PROJECT NO. 6

Project Name, Location and Owner's contact information:

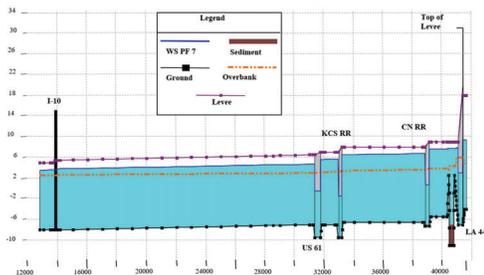
Nature of Firm's Responsibility:

Maurepas Freshwater Diversion Structure
St. John the Baptist Parish, La

Coastal Protection and Restoration Authority
 Brad Miller or Russ Joffrion
 225.342.4122



AECOM has modeled the flow distribution in ADCIRC and Delft3D. The model adjusted various Outfall Management Features; such adjustments will be required in using the Jefferson Parish SWMM5 model.



AECOM's HEC-RAS model of the Maurepas conveyance channel demonstrates our ability to understand the USACE models created on the EBWB of Jefferson Parish.

This Project is a major Civil Works effort to provide eco-restoration and save 220 square miles (160,000 acres) of Cypress-Tupelo forested swamp. Federal and state restoration initiatives, especially the Coastal Wetlands Planning Protection and Restoration Act (CWPPRA), identified the north section of the Maurepas Swamp as an area where wetlands vegetation is stressed and dying.

The project will divert 2,000 cfs of Mississippi River water into the Maurepas Swamp through the use of a hydraulic control structure built into the Mississippi River Levee (MRL) and a five mile long conveyance channel for flow routing into the swamp. The main hydraulic elements include the gated headworks, culvert crossings under two major roadways and two railroads, and flow control elements in the swamp, including weirs to prevent short-circuiting of the flow, embankment cuts to enable full dispersion of the flow, and check valves to prevent backflow.

AECOM was contracted to undertake a hydraulic feasibility study, conduct preliminary and final engineering, prepare plans and specifications, and submit Section 10/404 and Section 408 permits to the USACE NOD. AECOM performed the feasibility study to determine the maximum capacity of the conveyance channel and any backwater effects on the surrounding local drainage. This phase utilized SWMM, HEC-HMS, HEC-RAS, UNET and SMS TABs (RMA-2, RMA-4) for 10/20 hydrodynamic/water quality modeling and ADCIRC for the Hydrodynamic Model. A SWMM model of the drainage system throughout St. John the Baptist Parish was created for sizing a drainage pumping station to pump water out of the Parish basin and into the project conveyance channel, thus preventing backwater effects on the public drainage network.

AECOM personnel included one of the developers of the ADCIRC model who was instrumental in modifying this new Hydrodynamic Model for application to the subject project. In the early 2000's this was one of the most sophisticated and best 3D models utilized by both CPRA and the USACE. In 2019 the newer Delft3D hydrodynamic model was applied to the determine the dispersion of water and nutrients into the swamp. The results closely mimicked the predicted water distribution from the ADCIRC model, thus validating the original modeling, and adding the nutrient dispersion component.

Estimated Cost:

Completion Date (Actual or estimated):

Entire Project:

Work for which Firm was Responsible:

2021

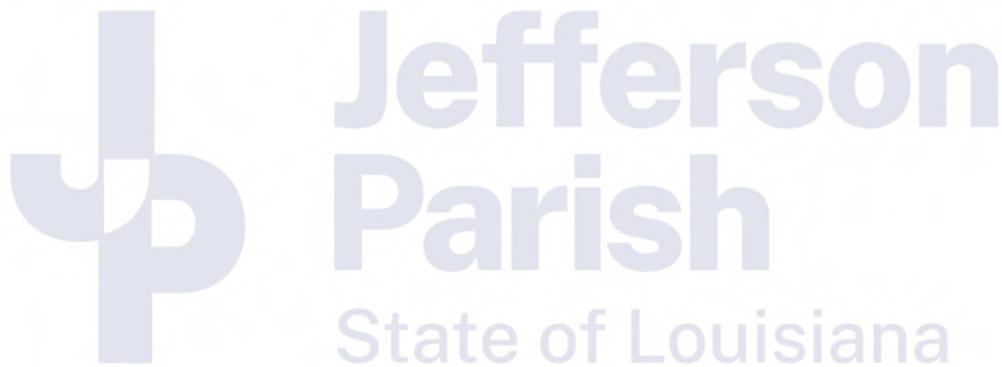
\$185M

\$2M

Nature of Firm's Responsibility:

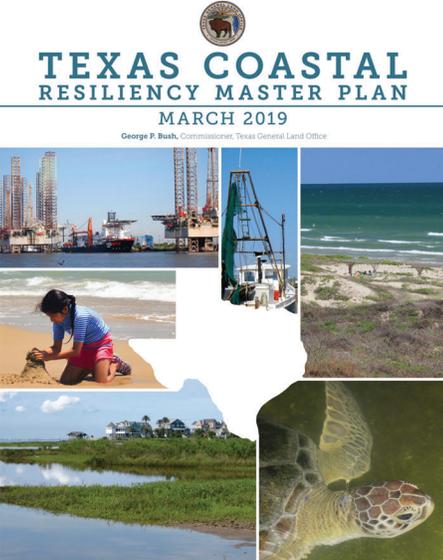
The USACE West Shore Lake Pontchartrain flood protection system will share the Maurepas Diversion corridor from the MRL to Airline Highway, the last roadway crossed by the conveyance system. The flood protection levees and walls will act as a dam to prevent the eastward movement of water throughout a significant portion of the area. HEC-HMS was used to model the hydrology and stormwater runoff that must be conveyed northward into the swamp on the west side of the conveyance channel. A HEC-RAS 1D model was built to size the requisite drainage ditches and the drainage culverts with sufficient capacity to prevent flooding of adjacent properties. The outfall of the Marathon Petroleum hydrocarbon storage facility would also be blocked by the reconfiguration. A HEC-RAS 2D model is currently being constructed to model the facility's discharge into the swamp.

AECOM also completed data collection, including surveys and geotechnical borings as well as analysis of these data for use in the design of the plans and specifications currently at 95% working with CPRA with reviews by the USACE NOD. The project includes an intake structure comprised of three automated sluice gates each sized 10-ft x 10-ft, connecting to box culverts that travel underneath the Mississippi River levee and adjacent state highway (LA 44 River Road) and then through a settling basin to allow large sediment to settle out and then enter the conveyance system. The trapezoidal channel is 200-ft by 60-ft bound by earthen levees on each side.



L. Work by Firm or Joint-Venture members which best illustrates current qualifications relevant to this Project. Please include any and all work performed for Jefferson Parish. Please attach additional pages if necessary.

PROJECT NO. 7

Project Name, Location and Owner's contact information:	Nature of Firm's Responsibility:	
<p>Texas Coastal Resiliency Master Plan, <i>Statewide Texas</i></p> <p>Texas General Land Office Joshua Oyer, Coastal Resources Division Project Manager Phone: 512.475.5130</p>  <p><i>We are helping Texas communities with the tools and resources they need to not only recover from the last disaster, but to be more resilient for future disasters.</i></p>	<p>In March 2019, the Texas General Land Office (GLO) released the second Texas Coastal Resiliency Master Plan (Resiliency Plan or Plan), an ambitious coastal planning effort to restore, enhance and protect more than 367 miles of coast and 3,300 miles of bays and estuaries for the State of Texas. The Resiliency Plan was selected by the Climate Change Business Journal for a project merit award in 2019 under the climate change adaptation and resilience category. The Resiliency Plan emphasizes shoring up the coast by using nature and infrastructure-based projects that are reviewed by and coordinated with a Technical Advisory Committee of over 200 coastal experts and stakeholders, including members of federal, public, and private entities. The recommendations made in the Resiliency Plan are backed by current findings on Texas coastal environments, storm surge and relative sea level rise predictions, economic benefits, and ecosystem services, among others. By championing a statewide Resiliency Plan to guide coastal management, the GLO will confirm that Texas works to restore, enhance, and protect its coastlines and communities now and in the future.</p> <p>AECOM has been the sole engineering contractor working with the GLO to develop the Texas Coastal Resiliency Master Plan since the first iteration in 2017, and currently serves in this capacity working towards the 2023 Plan. AECOM's role has been multi-faceted, including both planning and technical tasks. AECOM's planning tasks included facilitating stakeholder engagement and collaboration, identifying opportunities for innovative restoration methodologies for marine habitats (living shorelines, sediment management planning, sea level rise adaptation measures, and writing/producing the final Resiliency Plans. The technical tasks undertaken by AECOM include project reviews, economic analyses, coastal resiliency project design guides, coastal modeling, and initiating a Technical Working Group TWG working to value ecosystem services.</p> <p>The TWG, which began meeting in early 2020, is comprised of subject matter experts on ecosystem service economic valuations and hazard mitigation funding. To improve the future project selection process, the GLO is interested in gaining a better understanding of the costs and the value of the benefits provided by green and hybrid green-gray infrastructure solutions for coastal resiliency.</p>	
Completion Date (Actual or estimated):	Estimated Cost:	
	Entire Project:	Work for which Firm was Responsible:
May 2023	\$7.5M	\$6.3M

Nature of Firm's Responsibility:

This interest is part of a greater goal to evolve the project evaluation process by modifying the metrics used to better capture the important values that the nature-based components provide, so that green-gray hybrid infrastructure projects may score higher in evaluation tools, gain greater access to funding sources, and ultimately provide greater project solutions than traditional gray infrastructure alone. The aim is that through the course of this project, GLO and AECOM can work collaboratively with the TWG to advance this field and work toward better tools, data, and best practices for integrating green and hybrid infrastructure into Texas coastal resiliency planning for a stronger and more resilient Texas coastline.

Through the Resiliency Plan, AECOM is working to communicate that the Texas Gulf Coast is a dynamic and changing environment. The multitude of investigations conducted by the world's top coastal researchers point to a future Texas coast that has already been and will continue to be susceptible to sea level rise, subsidence, and erosion. In order to plan for changing future scenarios, AECOM continues to look to understand probable changes to the coastal environment that can be addressed by ecological planning, monitoring, and adaptive management. In addition, AECOM will continue to assess gaps in resiliency and recovery needs within Texas to open the door for new solutions to help Texas's coastal communities develop as responsible stewards of their coastal assets

Project Management - AECOM is responsible for all administrative, coordinative, technical, QA/QC, and other functions related to the project. A kick off meeting will be held to make sure all parties are in complete agreement on project goals, deliverables, schedule, and initial technical approach. AECOM will develop a Project Execution Plan, Quality Control Plan, and Communications Plan to guide the project, and will also lead progress coordination meetings to monitor the project's progress.

Resiliency Planning Framework Development - AECOM will develop a detailed process and format by which all task activities and outputs are coordinated and incorporated into a comprehensive draft of the Plan. This task will build off of existing plans, reports and other documents as well as lessons learned and best practices the project team has identified from similar large-scale planning efforts in other coastal reaches and river basins.

Data Collection and Gap Analysis - When the resiliency planning framework development is complete, we will analyze the data and expand on it by collecting project-specific information. For example, to address data gaps that indicate where suitable projects have not been previously identified, AECOM will develop a project list for further consideration.

Develop and Maintain Project Database - Our team is developing and maintaining a database to collect and catalog project and reference information and to support programmatic modeling and presentation of planning results. The project database will be developed in ArcGIS, such as a File Geodatabase or an SQL Server. The development of the database is an ongoing process, increasing in complexity and functionality as the plan is developed.

Programmatic Modeling and Development of Evaluation Criteria - AECOM will develop programmatic modeling framework to support a structured framework for decision-making, including identification and development of priority coastal projects. After the framework is developed, the team will turn its attention to the development of criteria that reflect a range of evaluation parameters that include, among others, consistency with plan goals, social / cultural acceptability, funding prospects, and related items. The criteria developed in this task will inform project characterization efforts.

Stakeholder Engagement - AECOM is working closely with the Client and its Outreach Contract to promote stakeholder engagement throughout the project lifecycle. Our support includes assisting the Client in preparing for stakeholder meetings, providing responses to stakeholder requests and synthesizing stakeholder input, preparing for the stakeholder meetings, responding to stakeholder requests, and synthesizing stakeholder input.

Draft and Final Coastal Resiliency Plan - AECOM will provide the Client and its Outreach Contract with the technical data (such as report that includes the science-based methodologies, data, and outcomes of the plan) necessary for the development of a final Texas Coastal Resiliency Plan Report.

L. Work by Firm or Joint-Venture members which best illustrates current qualifications relevant to this Project. Please include any and all work performed for Jefferson Parish. Please attach additional pages if necessary.

PROJECT NO. 8

Project Name, Location and Owner's contact information:	Nature of Firm's Responsibility:	
<p>Stormwater Master Plan Update and Climate Change Vulnerability Assessment <i>Naples, FL</i></p> <p>City of Naples, Streets & Stormwater Department Greg Strakaluse, Director 239.213.5003</p>  <p><i>AECOM developed a clear, comprehensive and forward-looking master plan that encompass Naples' stormwater management program.</i></p>  <p><i>Public outreach was an important part of the stormwater master planning process. Our team polled the public on their concerns.</i></p>	<p>The City of Naples is the largest municipality in Collier County and lies on the southwest coast of Florida. The City encompasses approximately 15.9 square miles in total area of which about 1.4 square miles is comprised of bays, waterways, channels and other critically important water bodies.</p> <p><u>Stormwater Master Plan Update</u></p> <p>AECOM updated the 2007 plan and developed a clear, comprehensive and forward-looking master plan that encompasses Naples' stormwater management program, presented a detailed investigation into key components of stormwater as it is related to the City, established goals and provides a foundation for future policy decisions. This stormwater master plan update helped the City guide its stormwater management program for the next 10 years and included the following:</p> <ul style="list-style-type: none"> • Water Quantity Flooding - Identified key water quantity issues and recommendations on solutions • Water Quality and Ecology- Addressed current and future water quality and ecology issues by reviewing existing data and applicable regulatory standards and evaluating the monitoring program • Level of Service - Evaluated deficiencies in the system with respect to flooding and water quality by identifying the systems Level of Service water quantity and quality level • Regulatory and Development Code - Reviewed Naples' regulatory and development codes as they relate to stormwater management Climate Adaptation Evaluated mutually agreed upon local and regional sea level rise and resilience guidance documentation • Best Management Practices - Reviewed and expanded the City's current literature on Best Management Practices and the applicability of each towards meeting future stormwater goals • Operational Strategies - Provided guidance on how to enhance current operational strategies to assist the City in delivering stormwater protection services more economically, while better maintaining and reporting on current systems 	
Completion Date (Actual or estimated):	Estimated Cost:	
	Entire Project:	Work for which Firm was Responsible:
2020	\$429K	\$429K

Nature of Firm's Responsibility:

Climate Change Vulnerability

AECOM led the development of a Climate Change Vulnerability Assessment for Naples. This project built on the findings of the 2018 Stormwater Master Plan Update. As a part of the Stormwater Master Plan Update, AECOM worked with the City to identify sea level rise vulnerabilities of the stormwater system so that future water level conditions are considered at the most appropriate timing during planning and development of stormwater projects.

The citywide vulnerability assessment consisted of a climate science review, inventory of critical assets and a prioritization process to identify areas most susceptible to climate-exacerbated hazards. Findings of the vulnerability assessment are the foundation for the City's Climate Change Adaptation and Mitigation Plan, which is focused on developing strategies to integrate climate change adaptation and greenhouse gas emission reduction initiatives into city planning and operations. Throughout the project, AECOM also led a climate change working group that consisted of representative members from each city department. The working group provided input and feedback at all stages of the project with the shared goal of maintaining the City's voice and ensure ongoing City ownership.



L. Work by Firm or Joint-Venture members which best illustrates current qualifications relevant to this Project. Please include any and all work performed for Jefferson Parish. Please attach additional pages if necessary.

PROJECT NO. 9

Project Name, Location and Owner's contact information:	Nature of Firm's Responsibility:	
<p>Production and Technical Services including FEMA Levee Analysis & Mapping Procedures</p> <p>FEMA Ron Wanhanen, PE, CFM 940.383.7334 Ronald.Wanhanen@fema.dhs.gov</p>  <p><i>AECOM Staff conduct a tailgate meeting, reviewing historic photos, prior to a LAMP field reconnaissance</i></p>	<p>AECOM produced engineering products and supported Jefferson Parish and FEMA by producing FEMA maps for Jefferson Parish. We also worked with the Parish side by side while under contract by FEMA piloting FEMA's procedures for non-accredited levees, known as Levee Analysis and Mapping Procedures (LAMP) in the Greater New Orleans Area. AECOM identified and supported 5 pilot projects in Lafourche, Plaquemines, St Charles, St. Tammany, and Terrebonne Parishes. AECOM planned and conducted outreach, known as Local Levee Partnership Team meetings and field reconnaissance. The LAMP LLTP outreach effort were welcomed by the Parishes, in comparison to prior procedures, as a more holistic and fair process.</p> <p>Louisiana High Water Marks and Advisory Base Flood Elevations: After Hurricanes Katrina and Rita, AECOM collected hundreds of high-water marks throughout Louisiana to document the height of the flooding. AECOM also conducted an analysis for the Advisory Base Flood Elevations for rebuilding after the hurricanes.</p> <p>Additionally, AECOM completed flood studies in East Baton Rouge, Jefferson, Lafayette, St. Charles, St. Helena, and St. Tammany. Work included incorporating the USACE New Orleans District H&H analyses in the Hurricane Storm Damage Risk Reduction System Levee System Evaluation Report, into FEMA flood maps. Efforts of this politically sensitive HSDRRS project, as well as the LAMP pilot projects, have required extensive outreach activities with the local communities. AECOM reviewed the engineering and mapping for LOMRs and/or CLOMRs in 10+ parishes for the last 10+ years.</p> <p>AECOM Services Provided:</p> <ul style="list-style-type: none"> • Watershed studies, countywide studies, PMRs, levee analyses, and revisions to coastal flood hazard studies • Development of FEMA's Levee Analysis and Mapping Procedures • mitigation plan review, training, and guidance development • Supported Disaster Response • Responded to congressional inquiries by investigating issues and identifying facts and solutions related to request. This included digitizing all floodplains for all coastal Louisiana Counties in one week • Conducted 71 levee completeness checks. • Led Midterm levee inventory entries for 15 states and supported transition to USACE's National Levee Database. 	
Completion Date (Actual or estimated):	Estimated Cost:	
	Entire Project:	Work for which Firm was Responsible:
2018	\$220M	\$100M

L. Work by Firm or Joint-Venture members which best illustrates current qualifications relevant to this Project. Please include any and all work performed for Jefferson Parish. Please attach additional pages if necessary.

PROJECT NO. 10

Project Name, Location and Owner's contact information:

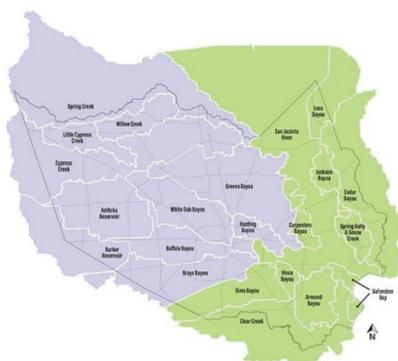
MAAPnext Greens Bayou Watershed Flood Study

Harris County, Texas

Brian Edmondson, PE, CFM

Phone: 713.684.4000

Email: Brian.Edmondson@hcfcd.org



AECOM has met or exceeded project management tracking metrics monthly for the project duration in a fast-paced, highly visible program.

Nature of Firm's Responsibility:

The purpose of the MAAPnext program is to produce updated hydrologic and hydraulic models, along with updated floodplain maps and risk products for all 22 watersheds in Harris County. The new studies will leverage data from 2018 LiDAR, structure survey data, NOAA Atlas 14 precipitation data, and advanced methods of hydrologic and hydraulic modeling including urban and pluvial flooding considerations.

As part of Phase 1, AECOM was assigned the Greens Bayou Watershed, which includes the analysis of 158 miles of 1D streams across the 200 square mile watershed, with additional streams modeled in the 2D areas as needed to accurately represent flooding conditions. The team met or exceeded all project management tracking metrics for the project duration and have consistently been first to meet project milestones ahead of other teams i.e., survey mobilization, hydrologic data development, and 1D/2D model setup and calibration) while maintaining high quality and managing one of the largest watersheds in Harris County.

For Phase 2, AECOM was awarded the San Jacinto Watershed, which will include the study of 105 1D miles over 220 square miles, also with additional 2D modeled streams.

Key tasks for the both phases of the study include but are not limited to::

- Review of existing models and local data as-builts, LOMRs, etc).
- Coordination with teams studying adjacent watersheds
- Use of updated Basin Development Factor (BDF) methodology for calculating Tc and R values for development of hydrographs in HEC-HMS
- Development of dynamically-coupled 1D/2D watershed-wide hydraulic models in HEC-RAS, version 5.0.7, using existing model data as well as new data
- Calibration of hydraulic models using historical data of recent major storms and gage flood frequency analysis
- Development flood risk products to better inform communities of revised flood risk
- Support the client and FEMA during the appeal process for the map update

The resulting Flood Risk Products are additional datasets used to convey the results of the complex H&H modeling effort to the general public in a simple format and relevant to their individual homes.

Completion Date (Actual or estimated):

October 2021

Estimated Cost:

Entire Project:

\$25M

Work for which Firm was Responsible:

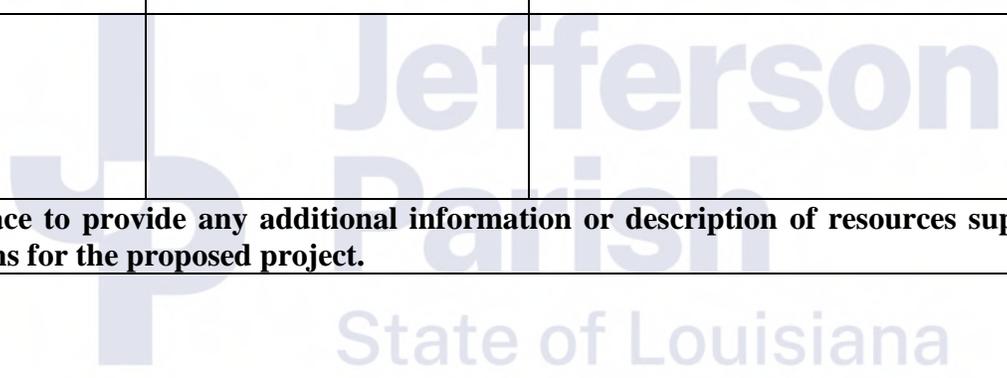
\$3.5M

TEC Professional Services Questionnaire

M. List all prior and/or on-going litigation between Firm and Jefferson Parish. Please attach additional pages if necessary.

Parties:		Status/Result of Case:
Plaintiff:	Defendant:	
1.		
2.		
3.		
4.		

N. Use this space to provide any additional information or description of resources supporting Firm's qualifications for the proposed project.



O. To the best of my knowledge, the foregoing is an accurate statement of facts.

Signature:  Print Name: _____
 Title: _____ Date: _____

TEC Professional Services Questionnaire

N. Use this space to provide any additional information or description of resources supporting Firm's qualifications for the proposed project

Minimum Qualifications

1. Principal who is a licensed, registered professional engineer in Louisiana

Mr. Michael Patorno, PE, PMP is our Principal for this program. Mr. Patorno has more than 38 years of engineering experience specific to Jefferson Parish and has been a licensed Louisiana Civil and Environmental Engineer (#0024197).

2. A professional in charge of the Project who is a licensed, registered professional engineer in Louisiana with a minimum of five years' experience

In addition to Mr. Patorno, our Principal, Mr. Clay Loyless is a registered Louisiana PE (#0028552), with more than 40 years of experience. In addition to Mr. Loyless, we have included a variety of engineers with the skillsets required for this program with Louisiana PEs that have more than the five (5) years required minimum experience including our subconsultants' staff engineers. Please reference the resume section for additional information on experience.

3. The persons or firms under consideration shall have one (1) employee who is a licensed, registered professional engineer in the State of Louisiana. A subcontractor may meet this requirement only if the advertised Project involves more than one discipline

In addition to AECOM's staff, please see our subconsultants' forms which show additional LA Registrations.

N. Use this space to provide any additional information or description of resources supporting Firm's qualifications for the proposed project

Evaluation Criteria

1. Professional Training and Experience

Jefferson Parish's Drainage Master Plan must accurately describe the behavior of the existing drainage network, assess the effect of potential improvements, and direct the resources to get the most value for its public expenditures. A full understanding of hydrologic and hydraulic (H&H) modeling is essential to develop a model of existing drainage systems. AECOM has extensive capabilities to turn that expertise into a sophisticated, yet straightforward, masterplan allowing Jefferson Parish to guide the management of the existing drainage assets, and direct future enhancements. To develop a sound drainage plan for Jefferson Parish, real-world accurate data is essential. AECOM is well versed in state-of-the-art data acquisition techniques and spatial analyses, along with the calibration techniques required.

Residents and stakeholders will benefit from a well-executed Drainage Master Plan that will minimize property damage and impacts on their quality of life. AECOM also offers a wealth of knowledge in evaluating flooding risks and improvement benefits, from typical storms to extreme weather events. The Parish can expect to receive H&H reports and presentation graphics from AECOM that are readily understood and that clearly pinpoint drainage issues. AECOM will deliver an analysis of the Parish's existing drainage system, an overall masterplan, including cost-effective recommended improvements, plus a valuable tool to use in-house for years to come.

Hydrologic and Hydraulic Modeling

I. Existing System Modeling

a. General System Modeling Capabilities

The Jefferson Parish West Bank Master Drainage Plan was authored by AECOM. In addition, since its creation, AECOM has also provided significant updates to the East Bank Master Drainage Plans and modeling of existing storm drainage systems and components for dozens of projects. Our experience provides AECOM with a clear understanding of the data, effort, topography, conditions, limitations, and requirements of Jefferson Parish both east bank and west bank. The original master plan activities required the same services that will be critical for this effort; including, software conversion and deliverables from the original UNET models to a combination of HEC and SWMM models with various updates as recently as 2010 and projects as recently as 2021. It is also worthy to note that we also have managed, undertaken and conducted master plan activities for drainage basins throughout the entire State of Louisiana as well as throughout the U.S.

Of note is AECOM's recent project with the Louisiana Water Initiative (LWI) for the Office of Community Services (OCD) that sets standards and base models for the entire State of Louisiana including all of Jefferson Parish.

Our lead Principal, Mr. Michael Patorno, PE, was involved in the original Plan and will serve as our Principal for this program.

Our engineers are experienced in a variety of applicable hydrologic and hydraulic computer models that have been successfully used to determine flood risk information and propose solutions for a variety of issues; including, applications to analyze flood prone areas, calculate hydrologic and hydraulic parameters, design hydraulic structures, design ecosystem restoration, evaluate floodplain limits, and a variety of other analyses and studies as may be required for this solicitation.

TEC Professional Services Questionnaire

N. Use this space to provide any additional information or description of resources supporting Firm's qualifications for the proposed project

Table 1 represents those software packages that AECOM has in-house and uses on a regular basis in pursuit of hydrologic and hydraulic evaluations for fluvial, lacustrine, estuarine, coastal, and urban studies.

TABLE 1: CURRENT IN-HOUSE MODELS USED BY URS					
HEC-HMS	HEC-RAS	HEC-FFA	HEC-6/6T	HEC-18	HEC-1FC
HEC-FDA	WMS	EFDC	TABS-MD	RMA2	MOD2D
SWMM	SWMM	QUICK-2	UNET	DWOPER	FESUMS
DAMBRK	MIKE21	ADC1RC		REF/Dif1	ReF/DiF2
STWAVE	REPWAVE	SBEACH	EDUNE	EBEACH	GENESIS
DNRBS	NMLONG	SED2D	FLOW2DH	RMD4	H1VEL
DYNALET	SURGE	SLUSH	SPLASH	Roller Model	BOUSSINESG Model
Assessment (WVA)	WHAFIS	WAVERUNUP			

AECOM has performed hydrologic and hydraulic analyses for the entirety of Jefferson Parish as part of work conducted for the **West Bank and East Bank Master Drainage Plans, and various state and local municipalities. Our engineers have applied 1D, 2D, and 3D models to dozens of complex estuaries, lacustrine environments, and urban areas.** Where needed, we have also developed customized hydraulic and sediment transport models to address special project conditions.

We have diverse expertise in H&H engineering as required by this solicitation, see **Table 1**. Our experience ranges from detailed H&H, including the evaluation of interior drainage facilities, to the analysis of canal flows and pumping station routines and if required sediment transport and river mechanics. The team is well versed in the use of all the requisite computer software and has applied this knowledge in solving real world problems for Jefferson Parish as addressed in the original Master Drainage Plan Efforts. The AECOM Team has utilized these software packages beyond the traditional flood control projects, including the analysis and design of environmental restoration projects, including bioengineering for stream bank stabilization. To further explain our specialized and technical competence, we offer the following:

b. Generation of Standard Project and Probable Maximum Floods

The AECOM Team has computed hundreds of Standard Project Floods (SPF) and Probable Maximum Floods (PMF) for fluvial, lacustrine, estuarine, coastal and urban environments. We typically use HMR-51 and HMR-52 from the

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National Oceanic and Atmosphere Administration to develop the magnitude and distribution of the PMF. These studies have been typically required for dam design and rehabilitation studies that we have conducted throughout the country.

c. Generation of Frequency Flows for Gauged and Ungauged Areas

The AECOM Team has performed thousands of flood frequency assessments for lacustrine, estuarine, coastal, and urban environments. We have used a variety of methods, including statistical analysis of gauge data and USGS regression equations, HEC-1, HEC-HMS, and TR-20. Our staff frequently use Technical Bulletin #17B, "Guidelines for Determining Flood Flow Frequency." Most of the flood studies mentioned in this proposal have required a frequency flow analysis because the studies were done for multiple frequency events. We have also generated frequency flows for regulated conditions. Examples of flow frequencies developed for regulated conditions include determining the downstream discharges from lakes, determining the impact of flood control structures along rivers, and generating frequency flows considering structures along rivers.

d. Development of Water Surface Profiles

The AECOM Team has conducted HEC-2 and HEC-RAS studies on more than 1,000 miles of river, including hundreds of miles of channels in Jefferson Parish and throughout Louisiana. This work has been conducted for the Parish, USACE, FEMA, and other agencies. Through preparing Floodplain Information Reports, Feasibility Reports and Design Memorandums for the USACE, as a study review contractor for FEMA,

TEC Professional Services Questionnaire

N. Use this space to provide any additional information or description of resources supporting Firm's qualifications for the proposed project

and through our ongoing role in FEMA's Hazard Mitigation Technical Assistance Program (HMTAP), AECOM staff are well versed in the determination and delineation of floodways and floodplains for the full range of exceedance events. We routinely perform the engineering analysis needed to obtain Letters of Map Revision (LOMR) and Letters of Map Amendment (LOMA). The AECOM Team has performed such services in Louisiana, Texas, Alabama, New York, Pennsylvania, Virginia, West Virginia, and Maryland and is fully proficient in meeting all the USACE's requirements.

AECOM staff are proficient in the use of HEC-RAS, GIS, AutoCAD and MicroStation to automate cross-section development and floodplain delineation. Our engineers and GIS specialists have developed and improved tools to work in the latest GIS environments.

In heavily urbanized watersheds that comprise natural water courses and storm sewer networks, and floodplains consisting of significant overbank storage requiring consideration of an unsteady state and/or 2D conditions, we have employed HEC-RAS, InfoWorks ICM, UNET, SWMM, FLO-2D, and others to model the watershed hydraulics. These programs provide a real-time analysis of the flood profile that captures the attenuation attributable to overbank storage capacity in completing the backwater hydraulics.

AECOM is currently managing three major programs for system-wide drainage analysis in Louisiana they include: Barataria Bay and River System; Maurepas Swamp, Mississippi River; and St. John the Baptist Parish - area wide basins and drainage Master Plan, which includes development for improvements and incorporation of new fresh water and sediment diversion systems. AECOM is managing the Louisiana Watershed Initiative (LWI) program which will ultimately entail a fundamental transformation as to how water resources in Louisiana are managed.

Please refer to Section 5, Prior Similar Experience for our significant Jefferson Parish and National experience in Master Plans.

AECOM has been in Louisiana for more than 70 years, providing keen insight and knowledge of the State, and an in-depth understanding of the Jefferson Parish drainage systems.

Inventory and Asset Management

I. Data Collection in Jefferson Parish and Louisiana

AECOM has been collecting, managing, and assessing representative hydrologic data in Jefferson Parish and throughout Louisiana since the 1950s and has been a leading practitioner during the rapid evolution of this field during the last three decades. Our data efforts are carefully planned and implemented to support the successful completion of a full range of infrastructure and environmental projects, including projects in fluvial, lacustrine, estuarine, coastal, and urban environments.

II. Key Aspects of AECOM's Data Collection Planning

- Establishment of data quality objectives tailored to address the specific decision requirements and goals of each planning/engineering study
- Development of work plans, technical approaches, and schedules which consider a detailed understanding of data collection objectives and the environment under investigation
- Preparation of quality assurance/quality control plans and health and safety plans
- Frequent contact with familiar state and local governments and boards—as well as private property owners and interested parties—to facilitate the review of background information and the timely implementation of field efforts
- Advanced planning for data analysis needs, such as the application of in-depth geo-spatial and geo-statistical analytical tools, modeling, and submittals for federal determinations

TEC Professional Services Questionnaire

N. Use this space to provide any additional information or description of resources supporting Firm's qualifications for the proposed project

III. AECOM's Wide Complement of H&H Data Acquisition Techniques

- Our thousands of man-hours of Jefferson Parish and Louisiana experience ranges from forested cypress freshwater wetlands to brackish estuarine marshes to large open-water coastal bays, from all of the state's major rivers (including the Mississippi River) and lakes (Lake Pontchartrain) to the smallest bayous, and urban areas.
- Our Jefferson Parish and Louisiana projects have encompassed nearly every conceivable monitoring and sampling physical, chemical, and biological parameter. AECOM has managed monitoring and sampling programs to obtain representative information using discrete (single) event, multiple events, continuous, and real-time designs, all while accommodating the unique variety of seasonal and logistical conditions which occur within our state.

VI. AECOM's of State-of-the-Art Digital Approaches to Data Acquisition

- **Orthorectified imagery from a range of resolutions and spectrums**—AECOM uses specialty software (e.g., Spatial Data Engine) to handle extremely large file sizes generated from high resolution large area imagery.
- **Topography and bathymetry**—AECOM is experienced in the acquisition, use, and interpretation of LiDAR, having worked with LiDAR data on almost all of our H&H and engineering design projects, including the Jefferson Parish West Bank Master Plan and the East Bank Master Plan Updates.
- **Hydrography**—AECOM understands the challenges to collecting accurate measurements of precipitation, stage, velocity, and discharge in extremely flat coastal South Louisiana and Jefferson Parish; we have planned, installed, maintained, and worked with a wide variety of field instruments including fixed and mobile Acoustic Doppler Current Profiler (ADCP) units.
- **Sedimentation** – AECOM is experienced in the placement of instrumentation and monitoring of sediment transport, as well as

coastal sand dunes, and a variety of other physical data collection in coastal areas.

- **Water quality parameters**—AECOM has extensive knowledge of the quality of local water bodies and approaches to monitoring critical parameters (temperature, salinity, dissolved oxygen, turbidity, and toxics).

V. High-end GIS & CADD for Advanced Data Management & Spatial Analysis

- Standard GIS designs using established platforms (ArcGIS Pro/online/desktop 10.8, MGE-Intergraph, GIS/Key etc.) and relational database engines (MS Access, Oracle, SQL Server).
- Customized project GIS operations and programming.
- Database population—obtaining available GIS layers for multi-spectral imagery, land-use, soil types, surface/vegetation types, topography, etc.; import information from parishes, state (LOSCO, LSU, LDEQ, LDNR, LADOTD) and federal agencies (USGS, USF&WS, NRCS, etc.). Data cleanup, conversion (raster, vector, etc.), ground-truthing, & QA/QC. Geo-spatial data analyses and custom project map layers and reports (e.g., runoff coefficients, grid-to-grid overland flow travel time). Collaborative tools and support of knowledge management.
- GIS Web-enabling (ArcGIS Online, GeoMedia, ASP, XML) and Web-hosting to facilitate project user access (multiple AECOM offices, clients) and to expedite/improve data population and analysis. Secure access to key stakeholders; public access to support disclosure, feedback, and local public user benefits.
- AECOM is currently developing Web-enabled GIS in support of several large-scale engineering/planning projects in south Louisiana, including the Maurepas Swamp Restoration, the Mid-Barataria Sediment Diversion, and the Louisiana Water Initiative which is a statewide Master Plan. An overview of our key support equipment and software is discussed in more detail above.

TEC Professional Services Questionnaire

N. Use this space to provide any additional information or description of resources supporting Firm's qualifications for the proposed project

VII. Systems Operation and Maintenance

Our team has a deep bench of asset management staff to draw upon and support local resources, as needed. AECOM is a certified Institute of Asset Management Trainer and Assessor.

AECOM has extensive experience in the development of owner Operations and Maintenance (O&M) Manuals and consistently follows an approach which focuses on reliability, maintainability and sustainability. Our understanding of the task will focus on understanding the current documents which will be obtained from multiple sources (stakeholder interviews, existing data, new equipment). All new components in the design (Pumps, Drainage Structures, Gates, Canals, and other system components) will require basic design and operational data from the engineers and vendors. O&M manuals will be essential to modification of the existing documents which AECOM included in the original efforts on the Master Plans previously done for Jefferson Parish. The AECOM design staff will clearly identify all the required data to be provided with new equipment and assist in modifications to the concept of operations.

These requirements will be clearly defined in a procurement process that will work closely with document control to ensure that all the documents required are received and kept in a secure place until all the information is received, and the engineer assigned to writing the modifications is ready to start.

The assigned engineer will focus on the process areas requiring modification to support operation. AECOM has provided O&M systems manuals for a variety of our master plans including all the pumping stations we designed and completed within Jefferson Parish. In addition, we have also provided O&M Manuals for a variety of different gates, major drainage structures, canals, etc. that we anticipate will be included in this update similar to prior work done for the Parish.

We recognize that asset management addresses many diverse areas from data collection, data cleaning and integration, to evaluation of asset attributes for condition, safety, and risk. It requires a diversity of skills, including database management or design, knowledge of best practice methods, and tools to support work order management and capital investment planning.

We recognize that the principal cost in many asset management projects is the collection and refinement of asset inventory data. We have extensive services and capabilities in asset data collection and management, including collecting the right data, in the right format, at the right time, to meet agency application analysis and reporting needs. While data collection is a fundamental process, it is often poorly done, requiring repetition and/or infilling. It is essential that data collection and integration closely match Jefferson Parish's data analysis and reporting needs, so that this data can be accounted for and provided to the modeling team for inclusion in graphics and mapping.

Cost Estimating

Our team's ability to accurately estimate project construction costs will be a vitally important service to the Parish. A recent example of our accurate estimates includes the Jefferson Parish Bond Program where we established a 10-percent contingency on all projects. However, due to accurate cost estimating and well-prepared plans and specifications, our contingency requirement was less than 6 percent, translating into a \$6.3M savings for the program. AECOM is skilled in various software and has full time in-house estimators that can provide detailed accurate cost estimates. Many of our estimators come from the construction industry and not only are certified estimators but have also spent many years of their careers providing hard bid construction budgets. Their knowledge of the materials and local conditions is unmatched.

TEC Professional Services Questionnaire

N. Use this space to provide any additional information or description of resources supporting Firm's qualifications for the proposed project

2. Capacity of Timely Completion of Newly Assigned Work

The key staff members in the organizational chart (on the following page) were selected based on their expertise and their availability to dedicate their strengths to this project. AECOM has deep "bench strength" and will provide additional resources and expertise as necessary to maintain schedule and quality need to provide a successful project. For this and future projects, AECOM continues to strengthen modeling experience with the addition of significant SWMM modeling experts to work in the New Orleans office.

Our Gulf Coast-based staff has the capacity to engage with new projects in all engineering fields set forth in our Statement of Qualifications. Our project performance tools allow for ongoing evaluations of team member workload assignments. AECOM's Project Delivery System allows Project Managers to efficiently monitor our available resources, manage schedules and control budgets to meet the goals of our clients.

Current Workload

Personnel	Current Availability (%)
Michael Patorno	40%
Clay Loyless	50%
Dan Zell	35%
Modelers	
Sreeni Bollu	75%
Sarah McEwen	50%
Johanna Guerrero	55%
Tom Willis	See MSMM TEC Form
Brooke Morris	See MSMM TEC Form
Anthony Holder	50%
Pol Bouratsis	40%
Samagra Rana	50%

AECOM and our teaming partners have more than 200 staff in our Louisiana offices including Jefferson Parish, with 40+ staff with the skillsets required to undertake this program. Currently our staff run about a 75% billable time, which allows for our team to shift project duties and consistently perform work for up to 100 full time equivalents with the modeling and mapping expertise required for this program.

Depth of Resources/Capacity in H&H

Our local staff and teaming partners include up to 40 full time equivalent staff with H&H experience with additional AECOM capacity being available from other regional offices as needed. AECOM has no issues with allocating the staff required for successfully delivering this project.

In addition to our local staff AECOM has more than 4,000 equivalent full-time staff that can provide additional capacity to assist with the modeling and mapping skillsets as may be required to complete this initiative.

TEC Professional Services Questionnaire

N. Use this space to provide any additional information or description of resources supporting Firm's qualifications for the proposed project

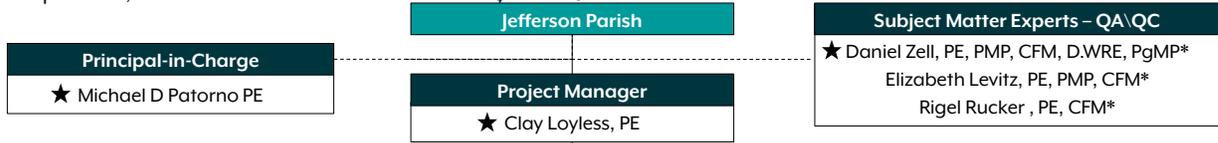
All staff listed are AECOM employees, except as noted:

Subconsultants

- (MSMM) – MSMM Engineering, LLC
- (TBS) - T. Baker Smith, LLC
- (BFM) – BFM Corporation, LLC



- ★ Indicates Key Personnel
(Resumes included in Section K.)
- *Indicates PE outside of LA



Key Technical Staff		
PLANNING	MODELING	ENGINEERING \ SUPPORT
<ul style="list-style-type: none"> • Watershed Planning ★ Jeff Irvin, PE* Chris Wright, PE, CFM* • Data Gap Analysis & Data Gathering ★ Rusty Rex, CFM, GISP Danny Symes Chris Mills, EIT (MSMM) Ian Growden, EIT (MSMM) • Spatial Tools & Visualization ★ Dave Turk, CFM, GISP Eric Curson (MSMM) • Coastal Engineering & Science ★ Chris Levitz, PE, CFM Taylor Nordstrom, PE* 	<ul style="list-style-type: none"> • Hydrology and Hydraulics ★ Sreeni Bollu, PE, CFM, PMP ★ Sarah McEwen, PE, CFM Johanna Guerrero, PE* Tom Willis, PE (MSMM) Brooke Morris, PE, PLA (MSMM) • H&H Model Conversion ★ Anthony Holder, PE, CFM* Pol Bouratsis, PhD, PE, CFM* ★Samagra Rana, PE* • Stream Gauging/Calibration ★ Ben Pope, PE* Kristen Weidenfeller, PE, CFM* 	<ul style="list-style-type: none"> • Engineering Support ★ Ryan Koenig, PE Bruce Lelong, PE ★ Jim Wilson, PE (MSMM) Scott Chehardy, PE (MSMM) • Field Survey/ROW/ROE ★ Chad Poche, PLS (BFM) • LiDAR Surveying ★ Andrew Szush, PLS (TBS) Eric Deroche (TBS) Ryan Labouef, LSI (TBS) ★ Kristi Teyki, GISP • Utilities Research ★ Greg France, PE
Additional Resources		
<ul style="list-style-type: none"> • Project Controls/Cost Estimator/Scheduling ★ Shannon Landry 	<ul style="list-style-type: none"> • Grant Research Coordination LWI/CDBG/Federal ★ Marisa Mason Anne Watkins 	<ul style="list-style-type: none"> • Water Quality BMP (Environ./Permitting) ★ Roy Knowles, PWS Patty Matthews, PE * Kerry Winkler

TEC Professional Services Questionnaire

N. Use this space to provide any additional information or description of resources supporting Firm's qualifications for the proposed project

3. Location of Principal Office

The Principal office from which the Master Plan will be managed and from which majority of the work will be performed is our New Orleans office located at 1555 Poydras St., Suite 1200, New Orleans, LA 70112

4. Adversarial Legal Proceedings

AECOM is not involved in any litigation against Jefferson Parish.

5. Prior Successful Project Completion

AECOM brings an in-depth understanding of the unique topography, hydrologic conditions, and layout of the existing Jefferson Parish drainage networks, having developed the original West Bank Master Drainage Plan and provided significant updates to the East Bank Plan.

AECOM has provided mapping and master plans in almost every state in the US, as well as in numerous counties and cities, while also providing hydrologic and hydraulic modeling in every basin in the nation.

AECOM's support of Jefferson Parish in producing FEMA maps for the Parish area has deepened our grasp of the impacts of the drainage network on the local community. Working with the Parish on the Levee Analysis and Mapping Procedures (LAMP) furthered our understanding of the interconnection between the drainage networks and the levees that are so vitally important to the protection of all Parish residents. AECOM knows the hydrology and drainage system of Jefferson Parish intimately, providing us with a significant head-start in developing the next generation Jefferson Parish East Bank Drainage Master Plan.

Louisiana High Water Marks and Advisory Base Flood Elevations

After Hurricanes Katrina and Rita, AECOM collected hundreds of high-water marks throughout Louisiana to document the height of the flooding. AECOM also conducted an analysis

for the Advisory Base Flood Elevations for rebuilding after the hurricanes.

AECOM completed flood studies in East Baton Rouge, Jefferson, Lafayette, St. Charles, St. Helena, and St. Tammany. Work included incorporating the USACE New Orleans District hydrologic and hydraulic analyses in the Hurricane Storm Damage Risk Reduction System (HSDRRS) Levee System Evaluation Report, into FEMA flood maps. Efforts of this politically sensitive HSDRRS project, as well as the LAMP pilot projects, have required extensive outreach activities with the local communities. AECOM reviewed the engineering and mapping for LOMRs and/or CLOMRs in 10+ parishes for the last 10+ years.

AECOM is also managing the Louisiana Watershed Initiative (LWI) pursuing a holistic approach to watershed management, one that goes beyond conventional mitigation measures and incorporates nature-based solutions including within the Jefferson Parish. LWI is developing computer models to better understand flood risk and help select projects best suited for investment in each watershed region of the State. AECOM is managing the program for LWI including the model and model reviews for the State(<https://watershed.la.gov/>).

Leveraging Best Practices – Master Plan Modeling and Mapping

AECOM has partnered with 25 State agencies and 42 total Cooperating Technical Partners (CTPs) to deliver services for over 75 Mapping Activity Statements, including delivery of projects for Lincoln Parish and the City of Mandeville, LA.

We continue to evolve our outreach strategies based on input from communities and their specific goals and objectives. Using proven methods, we also customize communications to specific stakeholders and listen to what works best locally.

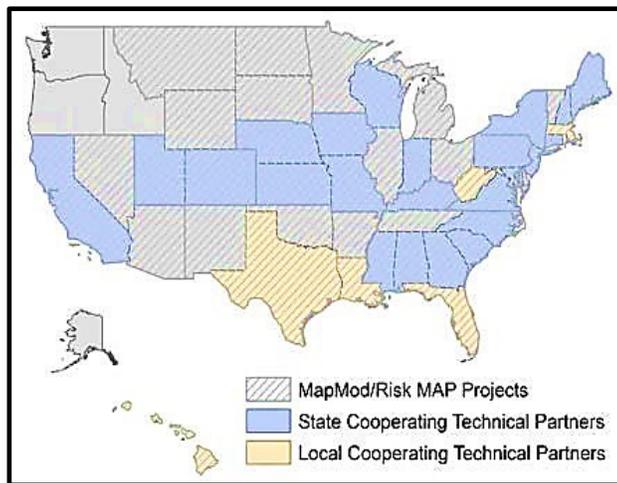
We have delivered the full range of services including: Discovery and First Order Approximates/Base Level Engineering, data development including LiDAR and field survey, riverine and coastal H&H modeling, Map

TEC Professional Services Questionnaire

N. Use this space to provide any additional information or description of resources supporting Firm's qualifications for the proposed project

production including regulatory and non-regulatory products, technical training, post-preliminary processing, public open houses and resilience meetings, web and IT tool development to facilitate display and distribution of flood risk data sets, levee and dam assessments, (Coordinate Needs Management Strategy) CNMS updates, State Business Plan development and other program coordination and support activities.

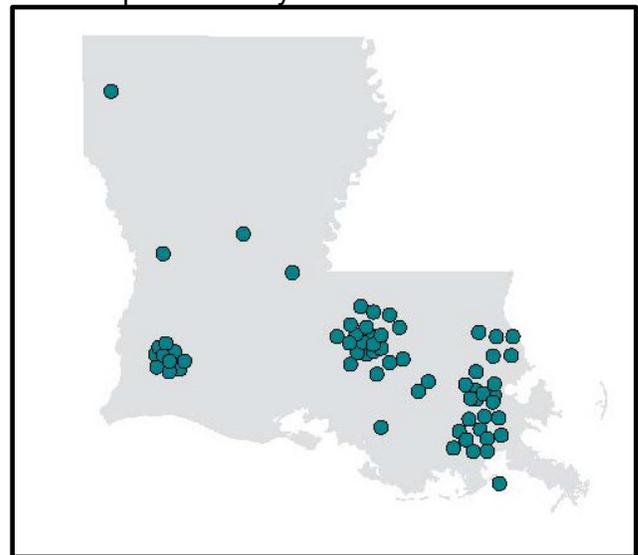
Extensive Flood Mapping FEMA Experience Across Region VI



For more than 20 years AECOM has performed FEMA related services across all States in Region VI. This includes tens of thousands of stream miles modeled and mapped as part of flood studies under two ongoing FEMA Risk MAP Production and Technical Service (PTS) contracts (Compass and RAMPP), two previous Map Modernization contracts with FEMA Region VI, the FEMA Hazard Mitigation Technical Assistance Program within the State of Louisiana and including Jefferson Parish.

Understanding of Louisiana-Specific Issues

AECOM continues to support Jefferson Parish, LA.OCD(LWI), DOTD, FEMA, the USACE and a wide range of federal, state, and local agencies on projects across Louisiana. With over 250 staff located in Louisiana, our staff both in-state and out, are experienced with the unique conditions in the State which influence flood risk, including coastal flooding, subsidence, multidirectional flow, and complex levee systems.



AECOM Drainage and Modeling Projects throughout Louisiana

6. Size of Firm - Professional and Support Personnel

AECOM has more than 200 staff in its Louisiana Offices, more than 4,000 staff in the Gulf Coast and 14,000 staff nationally with more than 4,000 of those with the skill sets required to perform the project currently advertised by the Parish. Locally AECOM and our partners have 40+ staff with experience in all the engineering tasks, modeling, data gap analysis, map conversions and updates and all other services required under this contract. Our local staff also includes Michael D. Patorno, PE, PMP our principal for this project who has an unmatched depth of experience with the Parish, the original Master Plans and all the necessary skillsets to direct this project successfully for the Parish.

TEC Professional Services Questionnaire

N. Use this space to provide any additional information or description of resources supporting Firm's qualifications for the proposed project

7. Past Performance on Parish Contracts

AECOM and our local staff including Mr. Michael Patorno, PE, and Mr. Clay Loyless, PE have led many modeling projects as well as a variety of programs for Jefferson Parish and have a proven track record of delivering on a wide range of projects and services for Jefferson Parish from our local Jefferson Parish and Louisiana offices to the great satisfaction of the Parish. Our Team looks forward to continuing this track record of delivering cost effective solutions on time and within budget to support the Parish's initiative. Our team brings significant advantages to the Parish in terms of:

Additional Jefferson Parish Projects

AECOM has worked extensively in Jefferson Parish on many Drainage Pumping Stations, Drainage Design Programs, and roadway programs including drainage that have been delivered on time and on budget with exemplary results. To name a few:

- Mounes Road Drainage Improvements
- Canal Safety Program
- Westminster/Lincolnshire Drainage Pump Station
- Whitney/Barataria Pump Station
- Railroad Canal Improvements from Avenue "B" to Keyhole Canal
- Swift/Canal "A" Drainage Improvements
- Swift Canal Phases I and II Drainage Improvements
- Avenue D Drainage Basin Improvements Phases I, II, III and IV
- Avenue B Drainage Basin Improvements
- Elmwood Pumping Station Upgrades
- Old Estelle Pumping Station Design Improvements
- Oak Pumping Station Improvements
- Westminster Lincolnshire Drainage Pumping Station Design
- Permanent Pump Station Design at 17th Street New Orleans and Jefferson Parish.
- New Estelle Drainage Pumping Station Design.
- Napoleon Avenue Drainage Improvements

- Clearview Parkway Drainage and Roadway Improvements
- Road Bond Program Phase I
- Road Bond Program West Bank

Additional Successful Delivered Jefferson Parish Contracts

- 201 West Bank Sewerage Facility Plan, I/I Analysis and Sanitary Sewer Evaluation Study (SSES)
- Marrero Oxidation Pond
- Bridge City STP Expansion
- Avondale Wastewater Treatment Plant
- East Bank River Ridge / Harahan Mini Systems Improvements
- West Bank Zone II Marrero Mini Systems Improvements
- City of Kenner WWTP Nos. 1 and 2 Improvements
- Bridge City Sewer Mini-Systems
- Jean Lafitte Wastewater Treatment Plant
- Zone II (Marrero) Lift Station Facilities
- Zone V (Council District 5) Lift Station Facilities
- City of Gretna Wastewater Treatment Plant Upgrades
- Jefferson Parish Generator Backup at East WWTP
- Vintage Drive Roadway Improvements
- Elmwood Canal Bridge Crossing at Kawanee Avenue

MSMM ENGINEERING INC TEC QUESTIONNAIRE

TEC Professional Services Questionnaire

A. Project Name and Advertisement Resolution Number:

Statement of Qualifications to Provide Professional Engineering and Supplemental Services for a Drainage Master Plan for the East Bank of Jefferson Parish, Resolution No. 138896

B. Firm Name & Address where Project work will be performed:



C. Name, title & contact information of Principal, as defined in Section 2-926 of the Jefferson Parish Code of Ordinances, who is a registered, licensed architect, professional engineer, or surveyor in the state of Louisiana:

Manish Mardia, P.E., President
mmardia@msmmeng.com
 (504) 559-1897

D. Name and contact information of employee who is a registered and licensed architect, professional engineer, or surveyor in the State of Louisiana in the applicable discipline. A subcontractor may be substituted here only if the advertised Project requires more than one discipline.

Manish Mardia, P.E., President
mmardia@msmmeng.com
 (504) 559-1897

E. Please provide the number of employees whose primary function corresponds with each category:

<u> 1 </u> Administrative	<u> 3 </u> Estimators	<u> </u> Specification Writers
<u> 1 </u> Architects (Licensed)	<u> </u> Geologists	<u> 2 </u> Structural Engineers
<u> </u> Chemical Engineers	<u> </u> Geotechnical Engineers	<u> </u> Graduate Engineers
<u> 5 </u> Civil Engineers	<u> </u> Interior Designers	<u> 5 </u> Project Managers
<u> 7 </u> Construction Inspectors	<u> 1 </u> Landscape Architects	<u> </u> Clerical
<u> </u> Ecologists	<u> </u> Land Surveyor	<u> </u> Grant/Funding Specialist
<u> 1 </u> Electrical Engineers	<u> </u> Mechanical Engineers	<u> </u> Sanitary Engineers
<u> 2 </u> Engineer Intern	<u> 2 </u> Environmental Engineers	<u> 1 </u> Administrative/Accounting
<u> </u> Professional Land Surveyors	<u> 3 </u> CAD Draftsman	<u> 30 </u> TOTAL
<u> </u> Environmental Scientist	<u> </u> Transportation Engineer	

F. Is this submittal by a JOINT-VENTURE? Please check:

YES NO

If marked “No” skip to Section I. If marked “Yes” complete Sections G-H.

General Professional Services Questionnaire

G. If submittal is by JOINT-VENTURE, list the firms participating and outline specific area of responsibility (including administrative, technical, and financial) for each firm. Please attach additional pages if necessary.

1. Not Applicable

2.

**H. Has this JOINT-VENTURE previously worked together? Please check:
YES NO**

I. List all subcontractors anticipated for this Project. Please note that all subcontractors must submit a fully completed copy of this questionnaire, applicable licenses, and any other information required by the advertisement. See Jefferson parish Code of Ordinances, Sec. 2-928(a)(3). Please attach additional pages if necessary.

Name & Address:	Specialty	Worked with Firm Before (Yes or No):
1. Please Refer to Prime Consultants Submittal		
2.		
3.		

J. Please specify the total number of support personnel that may assist in the completion of this Project:

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TEC Professional Services Questionnaire

PROFESSIONAL IN CHARGE OF PROJECT:	
Name & Title:	Manish Mardia, P.E. President
Project Assignment:	Quality Control Manager
Name of Firm with which associated:	MSMM ENGINEERING, LLC
Years' experience with this Firm:	11 (2011)
Education: Degree(s)/Year/Specialization:	M.S. in Civil Engineering, 1994, Louisiana State University B.S. in Civil Engineering, 1990, University of Jodhpur
Active registration: Year first registered/discipline:	Year First Registered: 1999 Discipline: <u>Environmental</u> State: <u>Louisiana</u> License No.: <u>28482</u> <i>Also registered in Mississippi (18522)</i>
Other experiences and qualifications relevant to the proposed Project:	
<p>Manish Mardia is a registered professional civil and environmental engineer; and is the President of MSMM Engineering, LLC. He is an experienced engineering manager and principal with twenty-six (26) years of experience in managing and designing public works projects for Jefferson Parish, municipalities in the greater New Orleans area, and the United States Army Corps of Engineers (USACE). His experience includes drainage pump station evaluation and design, drainage evaluation, hydraulic modeling, levee design, T-wall design, roadway, and utility design.</p> <p>Mr. Mardia has worked <i>on more than 200 projects for various departments of Jefferson Parish</i>. These projects were successfully completed on time and schedule. Projects Mr. Mardia has designed and provided quality control on range from Master Plan Development, Drainage Pump Station Evaluation and Design, Drainage Evaluation and Modeling, Infiltration and Inflow Evaluation and Project Alternative Development; Water Treatment and Collection; Wastewater Collection, Distribution and Treatment; Street and Roadways Design; and Landfill Design and Permitting.</p> <p><u>Louisiana Intermodal Terminal – Port of New Orleans, Chalmette, LA</u></p> <p>MSMM was tasked with developing an existing conditions Hydrologic and Hydraulic model for the new Port of New Orleans located in St. Bernard Parish. The site contains approximately 450 acres and will be utilized as an intermodal facility with ship, barge, rail, and truck traffic. The existing storage areas were modeled as subbasins in the HEC-HMS Version 3.5 (USACE 2010) and the 10-, 2-, 1-, and 0.2-percent annual chance event discharges for these recurrence intervals were directly input as flow hydrographs at corresponding locations in the hydraulic models.</p>	

PROFESSIONAL IN CHARGE OF PROJECT:

Name & Title:

Manish Mardia, P.E.

President

Frequency-based synthetic rainfall was used for each subbasin within a polder and the annual chance storm events were estimated using information obtained from the National Weather Service’s (NWS) Technical Memorandum HYDRO-35 (NOAA 1977), and the South-eastern Regional Climatic Center (SRCC) Technical Report 97-1.

The hydrologic analyses for this project used rainfall runoff modeling using HEC-HMS to develop flow hydrographs which were used in unsteady HEC-RAS models. The final hydrograph output was a flow hydrograph as opposed to a single flow value. Therefore, rather than provide tables with the flow hydrograph information at various locations, the user is referred to the digital HEC-HMS model output that contains all the flow hydrograph discharges.

Utilizing the selected alternative for the Proposed Full-Build Terminal Design facility and infrastructure plans, MSMM has also developed a “Proposed Conditions SWMM Model” that includes proposed drainage features (location/size of pump stations, detention pond sizing, major canals, major culverts) necessary for the Full-Build Terminal Design. MSMM will make modifications to the Proposed Conditions SWMM Model to determine solutions to drainage problems within the studied area such that the post-development drainage flow stage, peak and volume characteristics are the same as the predevelopment drainage characteristics. The modifications will include alternate solutions for storm routing (including hydraulic grade line analysis), proper sizing of detention basins, pumping adjustments including supplemental pumping at existing stations and construction of additional pumping facilities to Violet Canal and the Mississippi River.

Mr. Mardia is the Quality Control Manager for this effort. He reviewed modeling outputs, the draft modeling document and compared the project deliverables with the scope of the task order and the needs of the Port of New Orleans.

Jefferson Parish Watershed Master Planning, Jefferson Parish, LA

Through the Federal Silver Jackets Program at the USACE New Orleans District, MSMM is completing a detailed hydraulic analysis and watershed master planning document for Jefferson Parish. Utilizing the parish’s existing SWMM models, MSMM adjusted input parameters for rising sea levels, changing storm patterns as projected in the NOAA Atlas 14 rain models, and changing development plans as projected in the Jefferson Parish future land use plan. The output from this modeling effort was then quantified in terms of water surface elevation changes.

Utilizing modeling results, FEMA CRS guidance criteria, Jefferson Parish planning studies, input from the parish, and MSMM broad experience from previous drainage and flood studies; a series of recommended watershed management strategies were developed. These recommendations ranged from proposed implementation of standard low impact development principles, such as use of permeable pavements and bio-swales, to specific unique recommendations for Jefferson Parish watershed management regarding pump maintenance considerations, generation capacity and levee resiliency planning.

Mr. Mardia was the Quality Control Manager for this effort. He reviewed modeling outputs, the draft master plan document and compared the project deliverables with the scope of the task order and the needs of

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Manish Mardia, P.E.

President

Jefferson Parish.

Coventry Court Drainage Evaluation Feasibility Report, Jefferson Parish, LA

In early 2017, following repetitive street flooding in the Coventry Court area of River Ridge, MSMM Engineering worked with the Jefferson Parish District 2 office to propose a solution to the flooding issues in the area. The MSMM engineering team identified several potential options that could be evaluated. In 2018, the Jefferson Parish Council tasked our staff with developing a multi-phase feasibility report to evaluate several drainage solutions in the area.

As part of the Coventry Court evaluation, the Jefferson Parish drainage department requested that MSMM investigate and determine the feasibility of providing improved drainage. The investigation consisted of the following:

- Evaluation Phase/Data Review – collection and analysis of existing information
- Field Reconnaissance and Preliminary Survey – collection of relevant field information
- Model Runs and Calibration – updated the HEC-RAS model with the area’s data for 10-year, 50-year and 100-year storm events.
- Cost Estimating of Multiple Alternatives – provided detailed cost breakouts consisting of vendor furnished pricing data for materials
- Development of a Prioritized List of Recommendations – the alternatives developed were prioritized based on our engineering recommendations.

MSMM is the only entity to envision and develop the Coventry Court drainage pump station concept. The final report was completed in less than 6 months, and the final recommendation is to design a new drainage pump station on a vacant parcel owned by the parish between Coventry Court and Lee Court, westerly of Jefferson Highway. This 90 cfs (120 cfs ultimate) pump station with a 48’ open cut discharge force main placed down Colonial Heights Road and over the Mississippi River levee. Other project features consist of a discharge dolphin in the Mississippi River and upsizing of the Jefferson Highway drainage crossings and downstream conveyance. This recommended alternative provides the greatest pumping capacity while requiring the least amount of permanent drainage servitudes.

Mr. Mardia was responsible for the overall QA/QC on this project. He worked with the administration and Councilman’s office to identify a tangible project that would not only reduce drainage impacts in this River Ridge neighborhood by completing a master drainage plan document and identifying an alternative that could fit within the available Parish funding.

Woodlake Estates/Seton Park Subdivision Drainage Pump Station, Jefferson Parish, LA

MSMM was tasked by the Jefferson Parish council to evaluate drainage pump station alternatives to solve the issue of long-term flooding in within the Woodlake and Seton Park neighborhoods within the City of Kenner. In 2018, MSMM completed a feasibility study that developed multiple drainage pump station alternatives which bypass the capacity limitations of the canals and alleviate stormwater flooding in the area. At the completion of the feasibility report, the following alternatives were identified:

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- A new drainage pump station at the corner of Canal 17 and Canal 7 (west end of Joe Yenni Blvd.), a discharge force main westward, with a discharge basin in the West Return Canal.
- A new drainage pump station at the northeast corner of Vintage Drive and Platt Street on Canal 17, a discharge force main westward, with a discharge basin in the West Return Canal.
- A new inline drainage pump station at or near the corner of Canal 17 and Canal 7 with discharge into the canals and also with a discharge force main westwards to a discharge basin in the West Return Canal

Mr. Mardia provided the program management for the feasibility study. He led the team through the evaluation process that was based on the following considerations: Constructability, Hydraulic Modeling, Property Availability, Permit Concerns and Cost. The team decided that the inline station was the best solution, as it directly benefits the Woodlake Estates and Seton Park subdivisions as the 120 cfs pump station will be the new outlet, therefore no longer relying on the canal system. Following selection of the preferred alternative and final compilation of the report; MSMM submitted the final report to the Jefferson Parish drainage department and council in 2018 and were approved to develop an application to the DOTD Statewide Flood Control program for disaster assistance. The statewide flood control application was submitted in 2018; MSMM is currently awaiting the construction funding to initiate design.

New Orleans International Airport Drainage Pump Station, Kenner, LA.

MSMM recently completed full engineering design services for a new 600 cfs drainage pump station and for all landside drainage, as part of constructing the new airport terminal at the New Orleans International airport. The \$45 million of drainage mitigation design involved successfully delivering a true multi-disciplinary effort spanning civil, structural, electrical, mechanical and environmental engineering, hydraulic modeling (HEC-HMS and HEC-RAS), architectural services, cost estimating, environmental permitting, drafting (CAD, Civil 3D, REVIT, GIS), and agency coordination (USACE, CPRA, EJLD, SLFPA-E, LDNR, Entergy, City of New Orleans, City of Kenner, and Jefferson Parish). The station was designed to contain four 150 cfs pumps with 900 HP motors. As part of the pump station design, MSMM tasks required successfully negotiating the challenge of discharging stormwater over a hurricane protection flood wall. Project tasks included: Coordinating with USACE to obtain approval to run more than 4,000 ft. of steel discharge pipes over the floodwall (required Section 408 permitting), developing detailed structural design calculations, design and drafting for several structural elements including sheet pile cutoff walls, sheet pile TRS system, scour protection, a reinforced box culvert; as well as, coordination and permitting with the levee board and CPRA to secure the crucial clearances.

The landside drainage design effort required continuous close coordination with the program management team and design team to coordinate roadway drainage, terminal, and apron design. This required extreme flexibility and adaptability to incorporate numerous changes to other designs into the drainage design via multiple hydraulic modeling exercises, and multiple pipe networking and sizing. More than 5 miles of drainage piping (size range of 15” to 72” diameter), open channels and box culverts were designed to route stormwater flow from the terminal to the discharge points.

Mr. Mardia served as the Program Manager for the project. His duties included: handling the sensitive issue of operation and control of the pump station. This sensitivity of this subject became apparent due to the separate

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Name & Title:

Manish Mardia, P.E.

President

and unique demands of multiple entities – Jefferson Parish, City of Kenner, and the airport. Mr. Mardia’s vast experience with local drainage work, decades of relationships with local administrations and public works directors, and intimate knowledge of the Jefferson Parish drainage system was utilized to establish a path forward that was agreed to by all agencies. Mr. Mardia was responsible for ensuring the design produced by the MSMM team were in compliance with the Design Quality Review Plan and met regularly with the client to ensure the MSMM design was consistent with the overall airport effort.

Clearview Drainage Pump Station, St. Peter’s Ditch Improvements – Phase 4, Jefferson Parish, LA.

MSMM engineering staff provided complete design services for a 220 cfs drainage pump station located within the DOTD Right-of-Way of the Clearview Parkway/Earhart Expressway interchange. The goal of this pump station was to pump stormwater runoff from the existing detention pond network, over Cross Canal, and discharge directly into the improved St. Peter’s Ditch (box culvert). The project required multiple disciplines including civil, structural, electrical, and mechanical engineering, as well as cost estimating and drafting (CAD). The pump station structure contained three 75 cfs vertical lift pumps with 250 HP motors and several hundred feet of 36” discharge piping. Additional features of the project included a pile supported reinforced concrete structure, sheet pile intake area, trash rake with conveyor, conditioned control building, generator, traffic detour plan, discharge pipe aerial canal crossing, utility relocations, and other related improvements. Mr. Mardia was the program manager, he led the overall design effort and worked with Parish officials to identify the initial problem, making the design and implementation of this project a reality.

Statewide Flood Control Program Grant Drainage Improvements, Kenner, LA

LDOTD’s Statewide Flood Control Program grant funding was utilized to undertake stormwater drainage system improvements to two neighborhoods (University City and Audubon Place Subdivisions). The estimated project cost was \$4.57 million, with a grant amount of \$2.7 million. The project was conducted from beginning to conclusion, which included preparing the grant pre-application package, coordinating with the City and LDOTD staff, conducting hydraulic and hydrologic analyses (HYDRWIN and SWMM), communicating with LDOTD experts on the project’s feasibility and technical merit, conducting multiple site visits with LDOTD experts and project staff to clarify project features, existing drainage infrastructure, and facilitating continuous communication with the City’s elected representatives about the status of grant process. Through the course of this project, excellent working relationship was forged with LDOTD’s SWFCP staff and experts. Significant coordination was required with LDOTD staff due to the unique drainage conditions in the New Orleans area and due to the SWMM models of the city’s previous drainage master plan work required to be re-analyzed with LDOTD’s HYDRWIN software. The project involved (i) installation of new subsurface drainage pipes and inlets along three city streets: (ii) upgrading of existing drainage features with larger subsurface pipes, inlets, and outfall pipe along three other city streets. The subsurface pipes ranged in size from small 18” diameter circular pipes to large 54”x88” arch pipes. Adjustment of sanitary sewer house connections, and numerous pavement restoration tasks were included in this project, as well. During this project continuous coordination with the DPW staff was required. Most of the drainage improvements under this project were derived from previously completed Master Drainage Plan, the new improvements were compared with the Master Drainage Plan to ensure that no conflicts arise. Mr. Mardia served as the quality control manager for this project. He coordinated the drainage evaluation and design with DOTD, and reviewed the final P&S.

TEC Professional Services Questionnaire

KEY PERSON:

Name & Title:

Thomas M. Willis, P.E., MBA
H&H Engineer

Project Assignment:

Hydraulic and Hydrologic Engineer

Name of Firm with which associated:

MSMM
ENGINEERING, LLC

Years' experience with this Firm:

10 (2012)

Education: Degree(s)/Year/Specialization:

M.B.A., 1989, Louisiana State University
B.S., 1981, Civil Engineering, Louisiana State University

Active registration: Year first registered/discipline:

Year First Registered: 1991
Discipline: Civil and Environmental State: Louisiana License No.: 24205

Other experiences and qualifications relevant to the proposed Project:

Mr. Willis is a Senior Hydraulic Engineer with 40 years of experience. At MSMM he conducts civil engineering design and hydrologic and hydraulic (H&H) analyses of the stormwater drainage systems associated with roadways, bridges, highways, and airports in Southeast Louisiana. Mr. Willis has extensive experience with open channel hydraulics, channel restoration, geomorphology, hydrologic analyses, storm water analysis, master planning and design, bridge hydraulic and scour studies, and FEMA modeling and permitting. He is proficient in the use of EPA SWMM, HEC-RAS and HEC-HMS models.

Louisiana Intermodal Terminal – Port of New Orleans, Chalmette, LA

MSMM was tasked with developing an existing conditions Hydrologic and Hydraulic model for the new Port of New Orleans located in St. Bernard Parish. The site contains approximately 450 acres and will be utilized as an intermodal facility with ship, barge, rail, and truck traffic. The existing storage areas were modeled as subbasins in the HEC-HMS Version 3.5 (USACE 2010) and the 10-, 2-, 1-, and 0.2-percent annual chance event discharges for these recurrence intervals were directly input as flow hydrographs at corresponding locations in the hydraulic models.

Frequency-based synthetic rainfall was used for each subbasin within a polder and the annual chance storm events were estimated using information obtained from the National Weather Service's (NWS) Technical Memorandum HYDRO-35 (NOAA 1977), and the South-eastern Regional Climatic Center (SRCC) Technical Report 97-1.

The hydrologic analyses for this project used rainfall runoff modeling using HEC-HMS to develop flow hydrographs which were used in unsteady HEC-RAS models. The final hydrograph output was a flow

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hydrograph as opposed to a single flow value. Therefore, rather than provide tables with the flow hydrograph information at various locations, the user is referred to the digital HEC-HMS model output that contains all the flow hydrograph discharges.

Utilizing the selected alternative for the Proposed Full-Build Terminal Design facility and infrastructure plans, MSMM has also developed a “Proposed Conditions SWMM Model” that includes proposed drainage features (location/size of pump stations, detention pond sizing, major canals, major culverts) necessary for the Full-Build Terminal Design. MSMM will make modifications to the Proposed Conditions SWMM Model to determine solutions to drainage problems within the studied area such that the post-development drainage flow stage, peak and volume characteristics are the same as the predevelopment drainage characteristics. The modifications will include alternate solutions for storm routing (including hydraulic grade line analysis), proper sizing of detention basins, pumping adjustments including supplemental pumping at existing stations and construction of additional pumping facilities to Violet Canal and the Mississippi River.

Mr. Willis is working alongside Mr. Cecil Soileau to develop the model, develop the modeling outputs and write the modeling portion of the engineering report.

Stormwater Watershed Management Plan, Jefferson Parish, LA

The purpose of this Watershed Management Plan (WMP) is to provide an assessment of how flood stages will be affected by projected changes in future rain and sea-level conditions and to recommend strategies for mitigating increased flood loss damages caused by the projected environmental changes and by redevelopment and new development in the Jefferson Parish area watersheds. Mr. Willis performed the hydraulic modeling utilizing the **EPA SWMM** model to determine the existing and future conditions on over 50-percent of the Parish inside the levees for the 10-year, 25-year and 100-year storm events. SWMM models of the Jefferson Parish Eastbank and Catouatche Polder were analyzed individually. The combined areas of the two polders exceeded the inside the levee area criteria of 50-percent. Comparative future conditions were assessed using **Technical Paper 40 versus NOAA’s 2100 intermediate Sea Level Rise Project** which anticipates a 5.8-foot rise in sea level. Future lands use was based on the newly updated Jefferson Parish Edge 2040 land use information. **The Parish EPA SWMM numerical hydrologic-hydraulic models were used in assessing impacts.** The model analysis indicated that the existing pump system has sufficient capacity to maintain near-present water surfaces despite rising sea levels, but the percent utilization and power usage are increased so that maintenance wear and tear, and power provisions should be considered. Based on the findings of the SWMM model analyses, Mr. Willis made recommendations for future development and redevelopment to ensure that peak stages for the 10-year, 25-year, and 100-year storm events are not increased.

Southern University Drainage Outfall Ravine and Riverbank Instability Study, Baton Rouge, LA

Conditions at Southern University Baton Rouge Campus threaten human safety and guarantee serious losses of historic oaks, architecture, and vital utility systems unless action is taken to stop eroding conditions on the campus. MSMM was contracted by the U.S. Army Corps of Engineers under the USACE Planning Assistance to States (PAS) program to develop a framework for addressing these problems. This report was developed from a planning, hydrology, and hydraulics analyses perspective to consider the origins and effects of storm and

KEY PERSON:

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Thomas M. Willis, P.E., MBA
H&H Engineer

surface waters on the campus. With emphasis given to addressing the concerns of the University facility management, the charge given for this project was to identify consequential stream and bank instability and deterioration, with a focus on the lower reach of the ravine and the University bluff area facing the river. The desired deliverable for this project was a list of discrete problem areas which could be identified as separate projects for funding, analysis, and implementation of construction alternatives. The problem areas, the failure modes, and the effects of that failure were identified for each of these projects. An alternative approach for each project was developed with calculation of rough order of magnitude costs for design and construction. Alternatives provided were not embellished; but, with the exception of general ravine channel degradation, they were designed to be holistic, long-term, and sustainable in the sense that they will arrest the active failure forces without requiring follow-up projects or excessive special maintenance.

Mr. Willis ran the HEC-RAS model and developed project alternatives design to address erosion problems at the following areas on campus: Scott’s Bluff bank erosion, Army and Navy ROTC sink-holes, paving repairs and ravine side deterioration area, Baranco-Hill health center perimeter and outfall bank land-loss areas and the outfall ravine lower reach channel degradation area.

Coventry Court Drainage Evaluation Feasibility Report, Jefferson Parish, LA

In early 2017, following repetitive street flooding in the Coventry Court area of River Ridge, MSMM Engineering worked with the Jefferson Parish District 2 office to propose a solution to the flooding issues in the area. The MSMM engineering team identified several potential options that could be evaluated. In 2018, the Jefferson Parish Council tasked our staff with developing a multi-phase feasibility report to evaluate several drainage solutions in the area.

As part of the Coventry Court evaluation, the Jefferson Parish drainage department requested that MSMM investigate and determine the feasibility of providing improved drainage. The investigation consisted of the following:

- Evaluation Phase/Data Review – collection and analysis of existing information
- Field Reconnaissance and Preliminary Survey – collection of relevant field information
- Model Runs and Calibration – updated the HEC-RAS model with the area’s data for 10-year, 50-year and 100-year storm events.
- Cost Estimating of Multiple Alternatives – provided detailed cost breakouts consisting of vendor furnished pricing data for materials
- Development of a Prioritized List of Recommendations – the alternatives developed were prioritized based on our engineering recommendations.

MSMM is the only entity to envision and develop the Coventry Court drainage pump station concept. The final report was completed in less than 6 months, and the final recommendation is to design a new drainage pump station on a vacant parcel owned by the parish between Coventry Court and Lee Court, westerly of Jefferson Highway. This 90 cfs (120 cfs ultimate) pump station with a 48’ open cut discharge forcemain placed down Colonial Heights Road and over the Mississippi River levee. Other project features consist of a discharge dolphin in the Mississippi River and upsizing of the Jefferson Highway drainage crossings and downstream

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conveyance. This recommended alternative provides the greatest pumping capacity while requiring the least amount of permanent drainage servitudes.

Mr. Willis was the lead hydraulic modeler for the feasibility study. He worked directly with Mr. Jim Wilson to model the alternatives that were developed. Mr. Willis ran multiple model iterations and incorporated multiple streets within the project area. Through Mr. Willis modeling efforts, MSMM was able to provide Jefferson Parish with a conceptual level project that will bring extensive flood relief to the Coventry Court area.

New Orleans Airport Drainage Study, Kenner, LA.

MSMM was 100% responsible for the design and construction administration for the entire landside drainage system including over 37,000 linear feet of storm sewers ranging in sizes from 12” to 72”, over 600 drainage structures, box culverts and headwalls for the New North Terminal. MSMM also modelled and designed improvements to Canal 15 (including open channel improvements), box culvert under Taxiway C, connection to the Butler Canal, rip-rapped scour basins, and backflow preventers. MSMM coordinated with the roadway designer to establish top of casting elevations and curb inlet spacing, as well as, providing tie-in structures for the elevated roadway drainage and terminal building roof drains.

Landside drainage design was based upon a drainage model for combined Phase 1, 2, and catchup conditions to accommodate the construction of the new terminal. MSMM updated hydrologic characteristics (Tc, impervious area, runoff coefficients, etc.), evaluated and designed outfall routing to Canal 15, and outfall pipe to Butler (located north of Taxiway G). MSMM also designed required drainage improvements to connections to Canal 15 and to Butler Canal. The drainage design efforts involved updating CAD, GIS model mapping of boundaries for dry conditions, and for frequency dependent shifting boundaries. We identified area adjustments to boundaries used in Jefferson Parish HECHMS/HECRAS model, which was used for FEMA 100-Year flood plain analysis and airport improvement study communications. Hydrological analysis included use of Rational Method for storm drains, NRCS TR55 for culvert, channel capacity, HEC-HMS for overall check to Jefferson Parish Canal Pump system, and assurance of mitigation requirements tributary areas to Canal 14, Canal 15, and Butler Canal (Area upstream of Butler Canal and Tacca Canal). For Hydraulics design, MSMM utilized FAA prescribed methods for capacity analysis of individual structures, LaDOTD prescribed methodology for hydraulic grade line analysis of needed road storm drains, and HEC-RAS methodology for hydraulic grade line analysis of open channels and canal system.

Mr. Willis was the only modeler that worked on this project and completed the full evaluation. He was able to complete this assessment due to his familiarity with urban subsurface drainage systems, and the ability to cross reference more than 400 as-built drawings with the available data. Mr. Willis modeled different variations of the pump station. In addition, he was responsible for modeling all landside, airside drainage systems, and to incorporate all changes (made known) during construction.

Woodlake Estates/Seton Park Subdivision Drainage Pump Station, Jefferson Parish, LA

MSMM was tasked by the Jefferson Parish council to evaluate drainage pump station alternatives to solve the issue of long-term flooding in within the Woodlake and Seton Park neighborhoods within the City of Kenner. In 2018, MSMM completed a feasibility study that developed multiple drainage pump station alternatives which bypass the capacity limitations of the canals and alleviate stormwater flooding in the area. At the completion of

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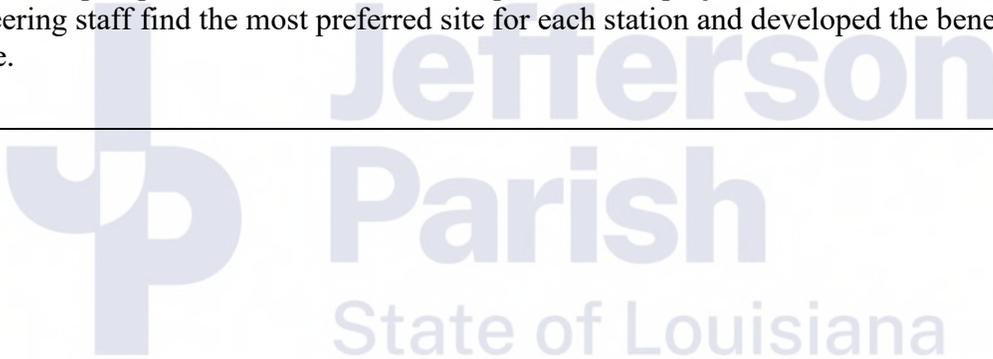
Name & Title:

Thomas M. Willis, P.E., MBA
H&H Engineer

the feasibility report, the following alternatives were identified:

- A new drainage pump station at the corner of Canal 17 and Canal 7 (west end of Joe Yenni Blvd.), a discharge forcemain westwards, with a discharge basin in the West Return Canal.
- A new drainage pump station at the northeast corner of Vintage Drive and Platt Street on Canal 17, a discharge forcemain westwards, with a discharge basin in the West Return Canal.
- A new inline drainage pump station at or near the corner of Canal 17 and Canal 7 with discharge into the canals and also with a discharge forcemain westwards to a discharge basin in the West Return Canal

Mr. Willis was the hydraulic modeler for this feasibility study. He modeled all the project alternatives and ran multiple iterations of pump station features for development of the project cost estimates. Mr. Willis helped the MSMM engineering staff find the most preferred site for each station and developed the benefits expected from each alternative.



TEC Professional Services Questionnaire

KEY PERSON:

Name & Title:

Jim Wilson, P.E., LEED® AP
Vice-President

Project Assignment:

Civil Engineer/Engineering Manager

Name of Firm with which associated:

MSMM
ENGINEERING, LLC

Years' experience with this Firm:

8 (2014)

Education: Degree(s)/Year/Specialization:

B.S. in Civil Engineering, 1988, Michigan Technological University

Active registration: Year first registered/discipline:

Year First Registered: 1992
Discipline: Civil State: Louisiana License No.: 35456
Also registered in Michigan (38800)

Other experiences and qualifications relevant to the proposed Project:

Mr. Wilson is a senior civil/drainage engineer with over 25 years of experience in the public sector, successfully designing and managing drainage, roadway, sewerage, waterline, and site development projects in multiple jurisdictions of south Louisiana. Mr. Wilson is fully versed in the development of drainage alternatives explored through detailed modeling efforts, and understands specific areas of Jefferson Parish topography that will be critical for the success of this project.

Mr. Wilson was the designer of record for the Sauv  Road drainage pump station. He was also the civil engineer tasked with developing the alternatives for the Coventry Court project. Mr. Wilson has extensive design experience developing drainage improvement projects in Jefferson Parish. He is intimately familiar with the characteristics, existing infrastructure, and design practices required by Jefferson Parish. As a result of designing multiple projects in this area within a short period of time, Mr. Wilson has developed excellent working relationship with many of the local authorities having jurisdiction (AHJ) over the features, utilities, properties, and regulatory requirements in Jefferson Parish.

Louisiana Intermodal Terminal – Port of New Orleans, Chalmette, LA

MSMM was tasked with developing an existing conditions Hydrologic and Hydraulic model for the new Port of New Orleans located in St. Bernard Parish. The site contains approximately 450 acres and will be utilized as an intermodal facility with ship, barge, rail, and truck traffic. The existing storage areas were modeled as subbasins in the HEC-HMS Version 3.5 (USACE 2010) and the 10-, 2-, 1-, and 0.2-percent annual chance event discharges for these recurrence intervals were directly input as flow hydrographs at corresponding locations in the hydraulic models. Frequency-based synthetic rainfall was used for each subbasin within a polder and the annual chance storm events were estimated using information obtained from the National Weather Service's (NWS) Technical Memorandum HYDRO-35 (NOAA 1977), and the South-eastern Regional Climatic Center

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Mr. Wilson is the engineering manager for the tasks associated with this project. He is responsible for working with the H&H engineering team to interpret the modeling results, develop the engineering/modeling report and advancing the project alternatives.

Kenner Drainage Master Plan Development, Kenner, LA

MSMM was responsible for updating the Kenner Drainage Master Plan through a combination of hydraulic modeling and alternatives analysis. As part of developing the Kenner Master Drainage plan project, our staff characterized the drainage system via field inspections and Hydraulic Modeling utilizing the EPA SWMM. MSMM personnel were previously involved in developing drainage planning documents, inclusive of the City of Kenner Drainage Master Plan completed in April of 2010. Several of the projects identified in that plan were subsequently constructed. However, several drainage projects remained so this report was developed to prioritize recommended subsurface drainage improvement projects on a Council District based by identifying ten (10) highest priority project in each Council District.

At the completion of this analysis, the City of Kenner received a compiled report that identified the highest priority projects, along with cost estimates, maps, and recommended drainage piping information. The recommended pipe sizing was based on a ten (10) year storm design standard. The Hydraulic Modeling for this Master Plan update was completed in a similar format to recent Hydraulic Modeling changes performed by Jefferson Parish. The result is a list of drainage projects that can compete for available funding.

Mr. Wilson was the lead civil engineer on the project. He developed the project alternatives based on the modeling outputs, completed cost estimates for the alternatives and met with Kenner officials to explain the expected benefits from each alternative.

Coventry Court Drainage Evaluation Feasibility Report, Jefferson Parish, LA

In early 2017 and following repetitive street flooding in the Coventry Court area of River Ridge, MSMM

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Name & Title:

Jim Wilson, P.E., LEED® AP
Vice-President

Engineering worked with the Jefferson Parish District 2 office to propose a solution to the flooding issues in the area. The MSMM engineering team identified several potential options that could be evaluated, and in 2018 the Jefferson Parish Council tasked our staff with developing a multi-phase feasibility report to evaluate several drainage solutions in the area.

As part of the Coventry Court evaluation, the Jefferson Parish drainage department requested that MSMM investigate and determine the feasibility of providing improved drainage. The investigation consisted of the following:

- Evaluation Phase/Data Review – collection and analysis of existing information
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- Development of a Prioritized List of Recommendations – the alternatives developed were prioritized based on our engineering recommendations.

MSMM is the only entity to envision and develop the Coventry Court drainage pump station concept. The final report was completed in less than 6 months, and the final recommendation is to design a new drainage pump station on a vacant parcel owned by the parish between Coventry Court and Lee Court, westerly of Jefferson Highway. This 90 cfs (120 cfs ultimate) pump station with a 48’ open cut discharge forcemain placed down Colonial Heights Road and over the Mississippi River levee. Other project features consist of a discharge dolphin in the Mississippi River and upsizing of the Jefferson Highway drainage crossings and downstream conveyance. This recommended alternative provides the greatest pumping capacity, while requiring the least amount of permanent drainage servitudes.

Mr. Wilson was the lead civil engineer for the project, he was tasked with working with the hydraulic modeler to develop project alternatives. The alternative developed by Mr. Wilson, and recommended for implementation for this project, consists of a 90 CFS pump station placed in the vacant Parish owned parcel between Coventry Court and Lee Court on the river side of Jefferson Highway. The pump station wet well and valve vault are sized to house four (4) pumps and valves for the ultimate pumping capacity of 120 CFS, but only three (3) pumps and valves would be installed initially as Levee View Drive and Hennessey Court would be considered a future service area. The pump station intake will be two 54” gravity sewer lines running parallel to Jefferson Highway and a 72” gravity sewer coming into the wet well from Jefferson Highway. The pump station would utilize three pumps with a single 48” forcemain to discharge storm water over the Mississippi River levee and into the river. The forcemain will be approximately 2,600 linear feet and terminate into a discharge dolphin structure in the Mississippi River. Mr. Wilson has provided conceptual plans for the entire project, outlined the permitting requirements and made sure the design aligns with the requirements for the Sauv  Road pump station layout.

Sauv  Road Drainage Improvements, Jefferson Parish, LA.

KEY PERSON:

Name & Title:

Jim Wilson, P.E., LEED® AP
Vice-President

Mr. Wilson performed 100% of the planning, engineering phase services and construction phase services for the construction of a drainage pump station in the Sauv  Road neighborhood of Jefferson Parish, LA. Through a collaboration between the USACE New Orleans District and Jefferson Parish, the project resulted in the design and construction of a 60 cfs (27,000 gpm) drainage pumping station, 2600 linear feet of 30" and 36" discharge forcemains and 60" gravity drainage. At the time of construction, the project was considered a major accomplishment for the neighborhood, as the area was heavily flooded following Hurricane Katrina and subsequent storm events. To this date, this project has been viewed as one of the most successful post Katrina storm risk reduction measures constructed in Jefferson Parish, as the flooding impact on the neighborhood has been greatly diminished.

Design and construction administration for subsurface drainage improvements to the Sauve Road and Jefferson Highway area consisting of the construction of a 40 cfs drainage pump station and force main discharging into the Mississippi River. The project also consisted of gravity line installations, any street work, and utility adjustments necessitated by the work.

Aubry St. CDBG 10-year Storm Drainage Improvement and Roadway Construction, New Orleans, LA

Mr. Wilson was the designer of record for the design of drainage and concrete road reconstruction of Aubry Street in the Gentilly neighborhood of New Orleans. The project length is approximately 1,400 linear feet, a four-block design that serves as major thoroughfare during the annual Jazz Festival. Project details are as follows: Concrete Roadway Reconstruction, drainage design to meet a 10-year storm event, relocation of existing utilities, development of bid documentation, cost estimates, construction management, and resident inspection services.

Mr. Wilson started his design in April of 2016, and the City of New Orleans requested an expedited design to allow the street to be open for the 2017 Jazz Festival. This was successfully designed and bid documentation was completed in time, as the construction finished in April of 2017, and the street was opened for the 2017 Jazz Festival.

Statewide Flood Control Program Grant Drainage Improvements, Kenner, LA

LDOTD's Statewide Flood Control Program grant funding was utilized to undertake stormwater drainage system improvements to two neighborhoods (University City and Audubon Place Subdivisions) in the city. The estimated project cost was \$4.57 million, with a grant amount of \$2.7 million. The project included preparing the grant pre-application package, coordinating with the City and LDOTD staff, conducting hydraulic and hydrologic analyses (HYDRWIN and SWMM), communicating with LDOTD experts on the project's feasibility and technical merit, conducting multiple site visits with LDOTD experts and project staff to clarify project features and existing drainage infrastructure, and facilitating continuous communication with the City's elected representatives about the status of grant process. Significant coordination was required with LDOTD staff due to the unique drainage conditions in the New Orleans area and due to the SWMM models of the city's previous drainage master plan work required to be re-analyzed with LDOTD's HYDRWIN software. The project involved (i) installation of new subsurface drainage pipes and inlets along three city streets; (ii) upgrading of existing drainage features with larger subsurface pipes, inlets, and outfall pipe along three other

KEY PERSON:

Name & Title:

Jim Wilson, P.E., LEED® AP
Vice-President

city streets. The subsurface pipes ranged in size from small 18” diameter circular pipes to large 54”x88” arch pipes. Adjustment of sanitary sewer house connections, and numerous pavement restoration tasks were included in this project as well. During this project continuous coordination with the DPW staff was required. Most of the drainage improvements under this project were derived from previously completed Master Drainage Plan, the new improvements were compared with the Master Drainage Plan to ensure that no conflicts arise.

Mr. Wilson was the designer of record for the project. He worked with officials from DOTD and the City of Kenner during the design and construction phase of this project.

New Orleans International Airport Drainage Pump Station, Kenner, LA.

MSMM recently completed full engineering design services for a new 600 cfs drainage pump station and for all landside drainage, as part of constructing the new airport terminal at the New Orleans International airport. The \$45 million of drainage mitigation design involved successfully delivering a true multi-disciplinary effort spanning civil, structural, electrical, mechanical and environmental engineering, hydraulic modeling (HEC-HMS and HEC-RAS), architectural services, cost estimating, environmental permitting, drafting (CAD, Civil 3D, REVIT, GIS), and agency coordination (USACE, CPRA, EJLD, SLFPA-E, LDNR, Entergy, City of New Orleans, City of Kenner, and Jefferson Parish). The station was designed to contain four 150 cfs pumps with 900 HP motors.

As part of the pump station design, MSMM tasks required successfully negotiating the challenge of discharging stormwater over a hurricane protection flood wall. Project tasks included: Coordinating with USACE to obtain approval to run more than 4,000 ft. of steel discharge pipes over the floodwall (required Section 408 permitting), developing detailed structural design calculations, design and drafting for several structural elements including sheet pile cutoff walls, sheet pile TRS system, scour protection, a reinforced box culvert; as well as, coordination and permitting with the levee board and CPRA to secure the crucial clearances.

The landside drainage design effort required continuous close coordination with the program management team and design team to coordinate roadway drainage, terminal and apron design. This required extreme flexibility and adaptability to incorporate numerous changes to other designs into the drainage design via multiple hydraulic modeling exercises, and multiple pipe networking and sizing. More than 5 miles of drainage piping (size range of 15” to 72” diameter), open channels and box culverts were designed to route stormwater flow from the terminal to the discharge points.

Mr. Wilson is the designer of record and engineering manager for the design of this pump station. He successfully led a multi-disciplinary team of design engineers, provided shop drawing review, and engineering during construction.

TEC Professional Services Questionnaire

SPECIALIST:

Name & Title:

Scott Chehardy, P.E.

Project Assignment:

Civil Engineer

Name of Firm with which associated:

MSMM
ENGINEERING, LLC

Years' experience with this Firm:

7 (2015)

Education: Degree(s)/Year/Specialization:

B.S. in Civil Engineering, 1994, University of Southwestern LA

Active registration: Year first registered/discipline:

Year First Registered: 1998
Discipline: Civil State: Louisiana License No.: 28532

Other experiences and qualifications relevant to the proposed Project:

Mr. Chehardy has over two decades of civil design and hydraulic evaluation experience in Louisiana's coastal Parishes. He has successfully designed levees and floodwalls, pump stations and forcemains, and canals and box culverts. His design and assessment experience spans levee and floodwall, roadway, water, sewer and drainage infrastructure elements. He has been an integral part of the study and design of the new 600 cfs drainage pump station in New Orleans International Airport, drainage study of Canal No. 17, Canal No. 7, and Parish Line Pump Station in Jefferson Parish, East Bank Subsurface Drainage Improvement Program in Jefferson Parish, Sewerage & Water Board of New Orleans' SELA Urban Flood Control Projects (Claiborne Avenue Manifold Canal and South Claiborne Avenue Canal II), Hurricane Katrina Related Water Restoration Projects for S&WBNO, etc. Mr. Chehardy's levee design work included West Bank & Vicinity, Lake Cataouatche Pumping Station to Segnette State Park, Phase 2, First Lift. of a 20,250 linear foot segment of the hurricane protection system (\$41.3 M), West Bank & Vicinity, Algiers Canal Levee West, Algiers Lock to Hwy. 23, Orleans & Plaquemines Parish (EAR \$230M to \$425M), and West Bank & Vicinity, Phase 2 Hurricane Protection, Algiers Canal (East), Hero Levee to Highway 23, WBV-49.2, Plaquemines Parish, LA (EAR \$474M to \$558M). Mr. Chehardy's responsibilities have included project management, design, permitting, and quality control.

Teche Vermillion Pump Station Debris Barrier, St. Landry Parish, LA. The Teche-Vermillion Pumping Station pumps fresh water from the Atchafalaya River into a six-mile long Conveyance Channel ultimately leading to the Vermilion River. This project included the design of a deep foundation anchor system for debris screening barrier to be installed on both north and south banks near the channel entrance. The project objective was to maintain the existing intake channel through debris screening process. CPRA is in charge of this station as of 2012, and identified the need for the design of the debris screen. MSMM designed the screen to the 30% stage, and submitted all requested design reports and plans to CPRA for review. Plans were reviewed and

SPECIALIST:

Name & Title:

Scott Chehardy, P.E.

comments received, but the project was later constructed via in-house funding mechanism at CPRA. Mr. Chehardy provided the design services completed by MSMM.

Bayou Mandeville Maintenance Dredging, St Bernard Parish, LA

This CPRA project was established to look at the possible need for maintenance dredging at the confluence of Bayou Mandeville and Lake Lery. The project was initiated as tug boat owners were noticing siltation in the navigation channel and were unsure of traversing their vessels through Lake Lery. MSMM helped guide the initial design of the marsh creation and worked with CPRA and USACE to establish the best practices for discharging dredge material to create wetlands. An evaluation was conducted to look at different containment structures such as silt fencing, hard structures and stacking dredge material. An initial permit application was drafted and routed for review through the USACE permitting office. Mr. Chehardy provided all of the design services completed by MSMM inclusive of the wetland creation design.

Cow Bayou Drainage Pump Station Complex, Orange, TX

The project involved completion of design services for an 8,800 CFS drainage pump station in Orange, TX for the USACE New Orleans and Galveston Districts. This new pump station is in a remote stretch of marsh, therefore complete site development was provided in addition to the pump station, safe house, floodwall, floodgate, and utility design. Mr. Chehardy was the designer of record for the project. He provided the civil site design, developed the environmental permitting requirements, outlined the requirements for the storage of fuel onsite and coordinated all design elements with the team which consisted of environmental, structural, mechanical, and electrical engineers.

Southern University Drainage Outfall Ravine and Riverbank Instability Design and Study, Baton Rouge, LA

The project was completed as part of the Silver Jackets program at the USACE New Orleans District with the goal of completing a feasibility study inclusive of engineering alternatives to formulate solutions for ongoing erosion and flooding problems on the Southern University Campus in Baton Rouge, Louisiana. Mr. Chehardy was responsible for working with the hydraulic engineer to develop the project alternatives and for developing cost estimates for each of the alternatives recommended.

Timber Creek Recreational Facility Design, Travis County, TX

This federal project designed for USACE Ft. Worth District turned a former neighborhood located in a flood zone into a recreational park consisting of trails, trail head connectors, shelters, picnic tables, roadway and parking areas, and sports courts. Mr. Chehardy was the designer of record for the project. He worked with Travis County and USACE to layout the site design, remove non-native trees for establishment of the trails, tie-in the new trails to existing trail heads in the area, establish ADA access for each shelter and picnic area, design the new one-way traffic pattern and parking areas and layout the restroom design.

Improvements to Bayou Segnette Drainage Pump Station No. 1, Jefferson Parish, LA. Project engineer for rehabilitation of the Bayou Segnette No 1 pump station. Design plans and specifications addressed replacement of four 70,000 gpm vertical axial flow pumps, six 350 Hp diesel engines and six right angle gear reducers. Professional Services: 2016

TEC Professional Services Questionnaire

SPECIALIST:

Name & Title:

Brooke Morris, PE, PLA
Hydraulic Engineer

Project Assignment:

Program Manager

Name of Firm with which associated:

MSMM
ENGINEERING, LLC

Years' experience with this Firm:

2 (2020)

Education: Degree(s)/Year/Specialization:

MLA in Landscape Architecture, 2009, Louisiana State University
BS in Biological Engineering, 2007, Louisiana State University

Active registration: Year first registered/discipline:

Year First Registered: 2021
Discipline: Civil State: Louisiana License No.: 45513

Other experiences and qualifications relevant to the proposed Project:

Ms. Morris is a licensed landscape architect and civil engineer that practices at the overlap of the two disciplines to produce functional designs. She specializes in stormwater management and green infrastructure planning, modeling and design. At MSMM, she provides HEC-RAS green infrastructure modeling and modeling review of EPA SWMM and other modeling outputs.

Southern University Drainage Outfall Ravine and Riverbank Instability Study, Baton Rouge, LA

Conditions at Southern University Baton Rouge Campus threaten human safety and guarantee serious losses of historic oaks, architecture, and vital utility systems unless action is taken to stop eroding conditions on the campus. MSMM was contracted by the U.S. Army Corps of Engineers under the USACE Planning Assistance to States (PAS) program to develop a framework for addressing these problems. This report was developed from a planning, hydrology, and hydraulics analyses perspective to consider the origins and effects of storm and surface waters on the campus. With emphasis given to addressing the concerns of the University facility management, the charge given for this project was to identify consequential stream and bank instability and deterioration, with a focus on the lower reach of the ravine and the University bluff area facing the river. The desired deliverable for this project was a list of discrete problem areas which could be identified as separate projects for funding, analysis, and implementation of construction alternatives. The problem areas, the failure modes, and the effects of that failure were identified for each of these projects. An alternative approach for each project was developed with calculation of rough order of magnitude costs for design and construction.

Alternatives provided were not embellished; but, except for general ravine channel degradation, they were designed to be holistic, long-term, and sustainable in the sense that they will arrest the active failure forces without requiring follow-up projects or excessive special maintenance.

SPECIALIST:

Name & Title:

Brooke Morris, PE, PLA
Hydraulic Engineer

Ms. Morris provided QA/QC of the modeling output, the project alternatives, and the modeling report. She provided assessment and details for green infrastructure concepts.

Lakeview City Park HMGP, New Orleans, LA

Ms. Morris was asked to assist with stormwater modeling for this project two weeks before the 75% design deadline. Ms. Morris troubleshooted the previous modeling efforts, refined the existing conditions model, and added proposed design interventions. She is currently carrying this modeling effort forward into later design phases.

Downtown Development District Drainage Upgrades Implementation, New Orleans, LA

Ms. Morris is providing stormwater modeling and green infrastructure design consulting services to support implementation of pervious paving parking lanes and drainage upgrades on a total of 45 blocks spanning from the French Quarter to Warehouse District.

Downtown Stormwater Opportunities Study, New Orleans, LA

Ms. Morris provided stormwater modeling services for this study on stormwater detention opportunities in Downtown New Orleans. The planning process considered over 50 different storage nodes in and around downtown New Orleans. Ms. Morris performed all the stormwater modeling in the city-wide SWMM model.

TEC Professional Services Questionnaire

INDIVIDUAL CONSULTANT:	
Name & Title:	Chris Mills, EIT Engineer Intern
Project Assignment:	Engineer Intern
Name of Firm with which associated:	MSMM ENGINEERING, LLC
Years' experience with this Firm:	3 (2019)
Education: Degree(s)/Year/Specialization:	BS in Civil Engineering, 2019, Louisiana State University
Active registration: Year first registered/discipline:	Year First Registered: 2019 Discipline: <u>Civil (EIT)</u> State: <u>Louisiana</u> License No.: 34186
Other experiences and qualifications relevant to the proposed Project:	
<p>Chris Mills is an EIT (taking PE exam March 18, 2022) at MSMM where he performs a wide variety of design and hydraulic evaluations for public works project in Orleans and Jefferson Parish. Mr. Wills also performs various field services, inclusive of collecting survey data, manhole location data, GIS data and provides construction administration services for various construction projects.</p> <p><u>Kenner Drainage Master Plan Development, Kenner, LA</u> MSMM was responsible for updating the Kenner Drainage Master Plan through a combination of hydraulic modeling and alternatives analysis. As part of developing the Kenner Master Drainage plan project, our staff characterized the drainage system via field inspections and Hydraulic Modeling utilizing the EPA SWWM. MSMM personnel were previously involved in developing drainage planning documents, inclusive of the City of Kenner Drainage Master Plan completed in April of 2010. Several of the projects identified in that plan were subsequently constructed. However, several drainage projects remained so this report was developed to prioritize recommended subsurface drainage improvement projects on a Council District based by identifying ten (10) highest priority project in each Council District.</p> <p>At the completion of this analysis, the City of Kenner received a compiled report that identified the highest priority projects, along with cost estimates, maps, and recommended drainage piping information. The recommended pipe sizing was based on a ten (10) year storm design standard. The Hydraulic Modeling for this Master Plan update was completed in a similar format to recent Hydraulic Modeling changes performed by Jefferson Parish.</p> <p>Mr. Mills provided field data collection services on this project, collecting survey data for drainage inlets,</p>	

INDIVIDUAL CONSULTANT:

Name & Title:

Chris Mills, EIT
Engineer Intern

manholes and street elevations. He also helped developed GIS graphics for the main report and was ultimately responsible for finalizing the report and submitting it to the client.

Lower 9th Ward NW Group D (RR111) Neighborhood Design Project

MSMM has been tasked with providing roadway design for approximately 16 blocks of this Lower 9th ward project. The project included mostly full depth replacement and waterline design. Other services included the development of drainage calculations and drainage features, the re-establishment of base course and new roadway on blocks fully covered with vegetative growth, and curb, gutter, roadway, sidewalk, and street surface improvements on a few blocks not requiring full reconstruction. Mr. Mills worked in conjunction with the lead engineer to develop line and grade analysis, plan and profile drawings, participation in field reviews and virtual plan-in-hand meetings, and coordination with CNO.

Gentilly Terrace North Group B (RR052) Neighborhood Roadway Design

MSMM has been tasked with providing roadway design for 8 streets of this Gentilly Terrace project as a subconsultant to PEC. The project included mostly full depth replacement and waterline design. Other services included the development of drainage calculations and drainage features, the re-establishment of base course and new roadway, and curb, gutter, roadway, sidewalk, and street surface improvements on a few blocks not requiring full reconstruction. Mr. Mills worked in conjunction with the lead civil engineer from PEC to help establish an acceptable full depth replacement of the roadway, establishment of utilities appropriate grade adjustments to street intersections, driveways, and sidewalks.

Lower 9th Ward South Group E (RR115) Neighborhood Roadway Design

MSMM has been tasked with providing full depth reconstruction roadway design for 20 blocks of this Lower 9th ward project. Design services included the development of drainage calculations and drainage features, the widening and addition of curbs on some streets, and full depth reconstruction inclusive of all utilities for most of the area. Mr. Mills worked in conjunction with the lead civil engineer to provide drainage modifications and improvements, and final grades compatible with adjacent properties to ensure positive flow of water toward designed catch basins.

West End Group A (RR193) Neighborhood Roadway Design, New Orleans, LA

MSMM Engineering was tasked by the City of New Orleans Department of Public Works to finalize the design and perform construction management of the West End Group A project. The project includes full depth reconstruction, patch, mill and overlay and incidental pavement repair inclusive of driveways, sidewalks, curbs, and manhole adjustments. Mr. Mills worked in conjunction with the lead civil engineer to revise the preliminary construction plans, update the project specifications and revise the cost estimate. He was also responsible for providing regular updates to the city concerning the progress of the requested design services.

TEC Professional Services Questionnaire

INDIVIDUAL CONSULTANT:	
Name & Title:	Arthur Ian Growden, EIT Engineer Intern
Project Assignment:	Engineer Intern
Name of Firm with which associated:	MSMM ENGINEERING, LLC
Years' experience with this Firm:	3 (2019)
Education: Degree(s)/Year/Specialization:	BS in Civil Engineering, 2020, University of New Orleans
Active registration: Year first registered/discipline:	Year First Registered: 2021 Discipline: <u>Civil</u> State: <u>Louisiana</u> License No.: <u>35468</u>
Other experiences and qualifications relevant to the proposed Project:	<p>Ian Growden is an EIT at MSMM where he performs wide-ranging services inclusive of CAD drafting, REVIT modeling, field services inclusive of survey and data collection, and the input of data for hydraulic models.</p> <p><u>Louisiana Intermodal Terminal – Port of New Orleans, Chalmette, LA</u></p> <p>MSMM was tasked with developing an existing conditions Hydrologic and Hydraulic model for the new Port of New Orleans located in St. Bernard Parish. The site contains approximately 450 acres and will be utilized as an intermodal facility with ship, barge, rail, and truck traffic. The existing storage areas were modeled as subbasins in the HEC-HMS Version 3.5 (USACE 2010) and the 10-, 2-, 1-, and 0.2-percent annual chance event discharges for these recurrence intervals were directly input as flow hydrographs at corresponding locations in the hydraulic models.</p> <p>Frequency-based synthetic rainfall was used for each subbasin within a polder and the annual chance storm events were estimated using information obtained from the National Weather Service's (NWS) Technical Memorandum HYDRO-35 (NOAA 1977), and the South-eastern Regional Climatic Center (SRCC) Technical Report 97-1.</p> <p>The hydrologic analyses for this project used rainfall runoff modeling using HEC-HMS to develop flow hydrographs which were used in unsteady HEC-RAS models. The final hydrograph output was a flow hydrograph as opposed to a single flow value. Therefore, rather than provide tables with the flow hydrograph information at various locations, the user is referred to the digital HEC-HMS model output that contains all the flow hydrograph discharges.</p> <p>Utilizing the selected alternative for the Proposed Full-Build Terminal Design facility and infrastructure plans,</p>

INDIVIDUAL CONSULTANT:

Name & Title:

Arthur Ian Growden, EIT
Engineer Intern

MSMM has also developed a “Proposed Conditions SWMM Model” that includes proposed drainage features (location/size of pump stations, detention pond sizing, major canals, major culverts) necessary for the Full-Build Terminal Design. MSMM will make modifications to the Proposed Conditions SWMM Model to determine solutions to drainage problems within the studied area such that the post-development drainage flow stage, peak and volume characteristics are the same as the predevelopment drainage characteristics. The modifications will include alternate solutions for storm routing (including hydraulic grade line analysis), proper sizing of detention basins, pumping adjustments including supplemental pumping at existing stations and construction of additional pumping facilities to Violet Canal and the Mississippi River.

Mr. Growden worked with the hydraulic engineering team and civil engineering team to develop the alternatives produced from the model and develop the engineering report that was provided to the Port of New Orleans outlining the current drainage conditions, the future conditions and project alternatives that should be implemented.

Airport Taxiway G Extension, Kenner, LA

MSMM provided extensive hydraulic modeling, engineering design and construction administration services for the extension of Taxiway Golf and Taxiway Bravo at the New Orleans International Airport. Taxiway G will serve the new terminal facility opened on the north side of the airport. In its current condition, Taxiway G does not extend to the Runway 11 threshold, and aircraft departing from Runway 11 are required to cross the active runway at Taxiway A to access Runway 11. Extending Taxiway G will provide much more efficient access to the Runway 11 threshold, and aircraft will no longer be required to cross an active runway to depart from Runway 11. Project design elements MSMM completed/assisted with included the following:

- Hydraulic Modeling – Design of the storm sewer system was based on the EPA SWMM methodology. Pipes were designed to flow full for the 5-year storm event and to provide one-foot freeboard below the inlet grate for the 10-year storm event for a free outfall condition. Some freeboard exceptions were made in the upper end of the storm sewer where the pipes to be employed by the system are existing and dual flow of storm sewer and ditch may occur along the vehicle service road. Freeboard exceptions will also occur in portions of the median area impounded by Taxiway G, Taxiway Ult. G2, Runway 11-29, and Taxiway Ult. G3 (now Taxiway A) where the existing ground and grates to remain in the system currently do not provide freeboard. Tailwater values at the canal outfalls were based on stage-frequency relationships extracted from the Parish HEC-RAS model.
- Drainage Design – Storm drainage design for the medians and infields, a culvert crossing for Taxiway B, channel stabilization design for Canal 15, and adjustments of the Airport Intake Canal to accommodate the vehicle service road relocation.

The project was bid for construction in 2020 and is currently in construction. Mr. Growden is providing construction phase services including construction administration, pay application review and approval, change order processing and engineering during construction.

Woodlake Drainage Pump Station Hydraulic Modeling and Preliminary Design

INDIVIDUAL CONSULTANT:

Name & Title:

Arthur Ian Growden, EIT
Engineer Intern

The Woodland Estates & Seton Park subdivision areas are located at the confluence of Canal 7 and Canal 17 in Kenner. The current drainage system consists of an enclosed gravity storm sewer system that outlets at various locations in the canals. The distance the stormwater within the canal must travel before it is pumped is excessive (nearly 2 miles to the Duncan Canal Pump Station and 2.25 miles to the Parish Line Pump Station). Due to the excessive distance, the water within the canal typically backs up, creating an increased head situation where the gravity drainage pipes are unable to discharge as intended. This generates a backwater flow condition which causes repeated flooding in the area. Because of the existing conditions in the area, MSMM completed a drainage evaluation report that evaluated options for removing the backflow condition in this area.

The subsurface drainage was modeled with the US EPA Storm Water Management Model (SWMM) and the canals and pump station utilized the River Analysis System (HEC-RAS) software. The HEC-RAS model conducted existing condition and other simulation under design storms of 10-year, 50-year and 100-year intensities. The resulting conditions were utilized for comparison purposes. The alternate iterations result in varying degrees of water surface lowering and flooding reduction. Extents of improvement projects, associated cost opinions, and required ancillary items such as right of way acquisitions, etc. were considered to select the most optimum combination which will provide the most flooding reduction. The modeling process indicated that both the subsurface drainage system and high-water elevations in the canal during a 10-year storm event are contributing to flooding issues in the project area. The recommendation was made to construct an in-line 120 cfs drainage pump station directly benefiting the two neighborhoods, as the pump station will be the new outlet, therefore no longer relying on the canal system. This alternative will indirectly benefit the entire area by removing the runoff created from these subdivisions from entering the canal system, therefore freeing up canal capacity from other areas.

Mr. Growden participated in developing detailed images for inclusion in the final modeling report. He was also involved in putting together the Statewide Flood Control Application and the Louisiana Watershed Initiative Application for this project. Recently he has been involved in collecting field information and properly citing the project within the park to provide the least amount of interruption to the neighborhood.

TEC Professional Services Questionnaire

SPECIALIST:

Name & Title:

Bob Yokum, P.E.
Structural Engineer

Project Assignment:

Structural Engineer

Name of Firm with which associated:

MSMM
ENGINEERING, LLC

Years' experience with this Firm:

9 (2013)

Education: Degree(s)/Year/Specialization:

B.S., 1975, Civil Engineering
M.S., 1980, Civil Engineering

Active registration: Year first registered/discipline:

Year First Registered: 1984
Discipline: Structural State: Louisiana License No.: 21422

Other experiences and qualifications relevant to the proposed Project:

Mr. Robert W. Yokum has over 40 years of experience in structural engineering. Mr. Yokum was employed by the USACE New Orleans District for 12 years, serving as a senior structural engineer for the design locks, dams, levees, floodwalls, floodgates, flood control structures, and drainage pump stations. Mr. Yokum has extensive experience designing USACE levees and floodwalls, performing stability analysis, pile group analysis pile capacity curves, designing sheet pile cutoff walls, and steel sheet pile temporary retaining structure (TRS). Mr. Yokum developed the unbalanced load criteria used by USACE for all levee design.

Mr. Yokum has provided detailed foundation and structural design, construction plans, inspections for all types of gated/non-gated dam and auxiliary monoliths including spillways, outlet structures, concrete retaining walls, stilling basins, training works, and various structures associated with spillways and outlet works. Since leaving USACE, and during his time with MSMM, Mr. Yokum has provided extensive design of dolphin structures, levee crossings, riprap discharge basins, bridges, structural foundations and is currently designing an 8,190 cfs pump station for USACE in Texas.

Coventry Court Drainage Evaluation Feasibility Report, Jefferson Parish, LA

In early 2017, following repetitive street flooding in the Coventry Court area of River Ridge, MSMM Engineering worked with the Jefferson Parish District 2 office to propose a solution to the flooding issues in the area. The MSMM engineering team identified several potential options that could be evaluated. In 2018, the Jefferson Parish Council tasked our staff with developing a multi-phase feasibility report to evaluate several drainage solutions in the area.

As part of the Coventry Court evaluation, the Jefferson Parish drainage department requested that MSMM

SPECIALIST:

Name & Title:

Bob Yokum, P.E.
Structural Engineer

investigate and determine the feasibility of providing improved drainage. The investigation consisted of the following:

- Evaluation Phase/Data Review – collection and analysis of existing information
- Field Reconnaissance and Preliminary Survey – collection of relevant field information
- Model Runs and Calibration – updated the HEC-RAS model with the area’s data for 10-year, 50-year and 100-year storm events.
- Cost Estimating of Multiple Alternatives – provided detailed cost breakouts consisting of vendor furnished pricing data for materials
- Development of a Prioritized List of Recommendations – the alternatives developed were prioritized based on our engineering recommendations.

MSMM is the only entity to envision and develop the Coventry Court drainage pump station concept. The final report was completed in less than 6 months, and the final recommendation is to design a new drainage pump station on a vacant parcel owned by the parish between Coventry Court and Lee Court, westerly of Jefferson Highway. This 90 cfs (120 cfs ultimate) pump station with a 48’ open cut discharge forcemain placed down Colonial Heights Road and over the Mississippi River levee. Other project features consist of a discharge dolphin in the Mississippi River and upsizing of the Jefferson Highway drainage crossings and downstream conveyance. This recommended alternative provides the greatest pumping capacity while requiring the least amount of permanent drainage servitudes.

Mr. Yokum was the lead structural engineering tasked with assisting in the development of alternatives for the feasibility report. Mr. Yokum is an expert levee design engineer and Mississippi River engineer, making him instrumental in helping to determine the best routing of the discharge pipe, for proper siting and size of the dolphin structure that will need to be designed in the river. Mr. Yokum provided conceptual level design for these features.

Woodlake Estates/Seton Park Subdivision Drainage Pump Station, Jefferson Parish, LA

MSMM was tasked by the Jefferson Parish council to evaluate drainage pump station alternatives to solve the issue of long-term flooding in within the Woodlake and Seton Park neighborhoods within the City of Kenner. In 2018, MSMM completed a feasibility study that developed multiple drainage pump station alternatives which bypass the capacity limitations of the canals and alleviate stormwater flooding in the area. At the completion of the feasibility report, the following alternatives were identified:

- A new drainage pump station at the corner of Canal 17 and Canal 7 (west end of Joe Yenni Blvd.), a discharge forcemain westwards, with a discharge basin in the West Return Canal.
- A new drainage pump station at the northeast corner of Vintage Drive and Platt Street on Canal 17, a discharge forcemain westwards, with a discharge basin in the West Return Canal.
- A new inline drainage pump station at or near the corner of Canal 17 and Canal 7 with discharge into the canals and also with a discharge forcemain westwards to a discharge basin in the West Return Canal

Mr. Yokum was the lead structural engineer for this project. He was responsible for developing the structural components of the identified alternatives, for assisting with cost estimating, for providing conceptual level design for the foundation of the pump station, the discharge crossing of the levee, and the discharge basin.

SPECIALIST:

Name & Title:

Bob Yokum, P.E.
Structural Engineer

New Orleans International Airport Drainage Pump Station, Kenner, LA.

MSMM recently completed full engineering design services for a new 600 cfs drainage pump station and for all landside drainage, as part of constructing the new airport terminal at the New Orleans International airport. The \$45 million of drainage mitigation design involved successfully delivering a true multi-disciplinary effort spanning civil, structural, electrical, mechanical and environmental engineering, hydraulic modeling (HEC-HMS and HEC-RAS), architectural services, cost estimating, environmental permitting, drafting (CAD, Civil 3D, REVIT, GIS), and agency coordination (USACE, CPRA, EJLD, SLFPA-E, LDNR, Entergy, City of New Orleans, City of Kenner, and Jefferson Parish). The station was designed to contain four 150 cfs pumps with 900 HP motors.

As part of the pump station design, MSMM tasks required successfully negotiating the challenge of discharging stormwater over a hurricane protection flood wall. Project tasks included: Coordinating with USACE to obtain approval to run more than 4,000 ft. of steel discharge pipes over the floodwall (required Section 408 permitting), developing detailed structural design calculations, design and drafting for several structural elements including sheet pile cutoff walls, sheet pile TRS system, scour protection, a reinforced box culvert; as well as, coordination and permitting with the levee board and CPRA to secure the crucial clearances.

The landside drainage design effort required continuous close coordination with the program management team and design team to coordinate roadway drainage, terminal and apron design. This required extreme flexibility and adaptability to incorporate numerous changes to other designs into the drainage design via multiple hydraulic modeling exercises, and multiple pipe networking and sizing. More than 5 miles of drainage piping (size range of 15” to 72” diameter), open channels and box culverts were designed to route stormwater flow from the terminal to the discharge points.

Mr. Yokum was the lead Structural Engineer for this project. He provided the structural design components for the pump station which included the foundation support, the pipe support, the concrete structures for the generator and safe house, as well as, the pipe bents for the pipe going over the T-wall. He also designed the wing walls and concrete intake basin on the flood side.

Cow Bayou Drainage Pump Station Complex, Orange, TX

MSMM is currently designing an 8,190 cfs drainage pump station in Orange County Texas as part of the Sabine Pass to Galveston Bay Texas Coastal Storm Risk Management and Ecosystem Restoration project. MSMM is responsible for all design activities for the features of work associated with the Sabine to Galveston, Cow Bayou Complex. The Cow Bayou Complex includes the design efforts for tie-in levee’s, transition floodwall tying the floodwall into the levee section, multiple T-wall monoliths (both straight and P.I. monoliths), Drainage Structures (sluice gate structures & culverts through the floodwall) that are used to maintain flows of existing bayous, horizontal and vertical lift gates, a sector gate monolith for navigational traffic, and the 8190 cfs pumping station. This project is being designed for the USACE New Orleans and Galveston Districts. MSMM was hand selected by USACE to design this project, based on recent drainage pump station design experience in the greater New Orleans area.

SPECIALIST:

Name & Title:

Bob Yokum, P.E.
Structural Engineer

Mr. Yokum is the lead structural engineer of record for the project. He is responsible for working with USACE to lead the design for the entire Cow Bayou complex. Mr. Yokum's design efforts include tie-in levee's, transition floodwall tying the floodwall into the levee section, multiple T-wall monoliths, drainage structures, sluice gate structures, culverts through the floodwall that are used to maintain flows of existing bayous, vertical and horizontal lift gates, a sector gate monolith for navigation traffic, and an 8190 cfs pumping station.



TEC Professional Services Questionnaire

INDIVIDUAL CONSULTANT:	
Name & Title:	Joshua Carson Project Manager
Project Assignment:	Project Manager
Name of Firm with which associated:	MSMM ENGINEERING, LLC
Years' experience with this Firm:	8 (2014)
Education: Degree(s)/Year/Specialization:	B.S. in Biology, 2007, Baldwin-Wallace University M.S. in Environmental Policy, 2011, Johns Hopkins University
Active registration: Year first registered/discipline:	N/A
Other experiences and qualifications relevant to the proposed Project:	
<p>Mr. Carson worked as an in-house consultant and Project Manager for the Corps of Engineers (New Orleans District) on multiple Federal projects including storm risk reduction, navigation, coastal restoration and recreation. Mr. Carson's role at the New Orleans District was to manage projects from project initiation through the planning and construction phases. Mr. Carson's position responsibilities included tasks typical of a project manager, such as, briefing senior level personnel, managing project delivery team members to execute project milestones, and relaying critical project information to sponsors, interested parties and the public. He was tasked for meeting legislative and organizational deadlines and to deliver projects on-time and under budget. Mr. Carson executed multiple environmental projects while at the Corps, including projects that required extensive environmental permitting and NEPA clearances.</p> <p>At MSMM, Mr. Carson has served as a project manager and environmental permitting coordinator. He is a responsible for being a liaison between the clients, engineering teams, and is often tasked with briefing the public or client about the project design. Mr. Carson serves as the lead project manager for all MSMM tasks completed in Jefferson Parish.</p> <p><u>Coventry Court Drainage Evaluation Feasibility Report, Jefferson Parish, LA</u></p> <p>In early 2017, following repetitive street flooding in the Coventry Court area of River Ridge, MSMM Engineering worked with the Jefferson Parish District 2 office to propose a solution to the flooding issues in the area. The MSMM engineering team identified several potential options that could be evaluated. In 2018, the Jefferson Parish Council tasked our staff with developing a multi-phase feasibility report to evaluate several drainage solutions in the area.</p> <p>As part of the Coventry Court evaluation, the Jefferson Parish drainage department requested that MSMM investigate and determine the feasibility of providing improved drainage. The investigation consisted of the</p>	

INDIVIDUAL CONSULTANT:

Name & Title:

Joshua Carson
Project Manager

following:

- Evaluation Phase/Data Review – collection and analysis of existing information
- Field Reconnaissance and Preliminary Survey – collection of relevant field information
- Model Runs and Calibration – updated the HEC-RAS model with the area’s data for 10-year, 50-year and 100-year storm events.
- Cost Estimating of Multiple Alternatives – provided detailed cost breakouts consisting of vendor furnished pricing data for materials
- Development of a Prioritized List of Recommendations – the alternatives developed were prioritized based on our engineering recommendations.

MSMM is the only entity to envision and develop the Coventry Court drainage pump station concept. The final report was completed in less than 6 months, and the final recommendation is to design a new drainage pump station on a vacant parcel owned by the parish between Coventry Court and Lee Court, westerly of Jefferson Highway. This 90 cfs (120 cfs ultimate) pump station with a 48’ open cut discharge forcemain placed down Colonial Heights Road and over the Mississippi River levee. Other project features consist of a discharge dolphin in the Mississippi River and upsizing of the Jefferson Highway drainage crossings and downstream conveyance. This recommended alternative provides the greatest pumping capacity while requiring the least amount of permanent drainage servitudes.

Mr. Carson was instrumental in working with the councilman’s office to understand the flooding issues plaguing the Coventry Court area. He worked with the councilman’s office to gain an understanding of the project focus and goals. He worked with the MSMM engineering team to relay the intended results of the feasibility study. He was involved in reviewing and briefing the results of the feasibility study; working with the councilman’s office to finalize siting of the intended pump station on Parish owned land.

Woodlake Estates/Seton Park Subdivision Drainage Pump Station, Jefferson Parish, LA

MSMM was tasked by the Jefferson Parish council to evaluate drainage pump station alternatives to solve the issue of long-term flooding in within the Woodlake and Seton Park neighborhoods within the City of Kenner. In 2018, MSMM completed a feasibility study that developed multiple drainage pump station alternatives which bypass the capacity limitations of the canals and alleviate stormwater flooding in the area. At the completion of the feasibility report, the following alternatives were identified:

- A new drainage pump station at the corner of Canal 17 and Canal 7 (west end of Joe Yenni Blvd.), a discharge forcemain westwards, with a discharge basin in the West Return Canal.
- A new drainage pump station at the northeast corner of Vintage Drive and Platt Street on Canal 17, a discharge forcemain westwards, with a discharge basin in the West Return Canal.
- A new inline drainage pump station at or near the corner of Canal 17 and Canal 7 with discharge into the canals and also with a discharge forcemain westwards to a discharge basin in the West Return Canal

Mr. Carson was involved in working with the Councilman’s office to develop the concept of providing a drainage pump station in the Woodlake/Seton Park area. Mr. Carson was tasked with leading the feasibility study, for briefing the project alternatives and preferred plan. Mr. Carson also oversaw the development of the

INDIVIDUAL CONSULTANT:

Name & Title:

Joshua Carson
Project Manager

application for the Statewide Flood control program.

Cow Bayou Drainage Pump Station Complex, Orange, TX

MSMM is currently designing an 8,190 cfs drainage pump station in Orange County Texas as part of the Sabine Pass to Galveston Bay Texas Coastal Storm Risk Management and Ecosystem Restoration project. MSMM is responsible for all design activities for the features of work associated with the Sabine to Galveston, Cow Bayou Complex. The Cow Bayou Complex includes the design efforts for tie-in levee's, transition floodwall tying the floodwall into the levee section, multiple T-wall monoliths (both straight and P.I. monoliths), Drainage Structures (sluice gate structures & culverts through the floodwall) that are used to maintain flows of existing bayous, horizontal and vertical lift gates, a sector gate monolith for navigational traffic, and the 8190 cfs pumping station. This project is being designed for the USACE New Orleans and Galveston Districts. MSMM was hand selected by USACE to design this project, based on recent drainage pump station design experience in the greater New Orleans area.

Mr. Carson is the lead project manager for the MSMM tasks associated with this project. He is responsible for working with the USACE PDT to determine scope and schedule, for managing the MSMM engineering team, and for the development of briefing materials to senior leaders at USACE and the non-Federal partners.

TEC Professional Services Questionnaire

INDIVIDUAL CONSULTANT:
Name & Title:
Eric M. Curson Design Manager
Project Assignment:
GIS Specialist GIS/CADD
Name of Firm with which associated:
MSMM ENGINEERING, LLC
Years' experience with this Firm:
7 (2015)
Education: Degree(s)/Year/Specialization:
Some classes: Purdue University Southeast College of Technology
Active registration: Year first registered/discipline:
N/A
Other experiences and qualifications relevant to the proposed Project:
<p>Eric Curson is a GIS Specialist, geospatial, and CAD manager at MSMM, where his project experience encompasses a variety of geospatial and software initiatives within the Federal and local market in southeast Louisiana. Mr. Curson has worked extensively on projects that require the use of ESRI ArcGIS and Microsoft SQL Server for Federal clients including the USACE New Orleans District. He has been instrumental in leading the GIS database creation and management for several MSMM projects including the Jefferson Parish I&I project, and the Chitimacha and Ascension Parish GIS planning tool initiatives. With a background in both CAD and GIS, Mr. Curson understands the similarities and differences between the two systems and has played an important role in working through any conversion issues that have arisen through the digitization and database creation process. As the lead drafter at MSMM, Mr. Curson has been instrumental in the development of project plans, working in conjunction with the engineering staff to finalize all submittals.</p> <p><u>Coventry Court Drainage Evaluation Feasibility Report, Jefferson Parish, LA</u></p> <p>In early 2017, following repetitive street flooding in the Coventry Court area of River Ridge, MSMM Engineering worked with the Jefferson Parish District 2 office to propose a solution to the flooding issues in the area. The MSMM engineering team identified several potential options that could be evaluated. In 2018, the Jefferson Parish Council tasked our staff with developing a multi-phase feasibility report to evaluate several drainage solutions in the area.</p> <p>As part of the Coventry Court evaluation, the Jefferson Parish drainage department requested that MSMM investigate and determine the feasibility of providing improved drainage. The investigation consisted of the following:</p> <ul style="list-style-type: none">- Evaluation Phase/Data Review – collection and analysis of existing information

INDIVIDUAL CONSULTANT:

Name & Title:

Eric M. Curson

Design Manager

- Field Reconnaissance and Preliminary Survey – collection of relevant field information
- Model Runs and Calibration – updated the HEC-RAS model with the area’s data for 10-year, 50-year and 100-year storm events.
- Cost Estimating of Multiple Alternatives – provided detailed cost breakouts consisting of vendor furnished pricing data for materials
- Development of a Prioritized List of Recommendations – the alternatives developed were prioritized based on our engineering recommendations.

MSMM is the only entity to envision and develop the Coventry Court drainage pump station concept. The final report was completed in less than 6 months, and the final recommendation is to design a new drainage pump station on a vacant parcel owned by the parish between Coventry Court and Lee Court, westerly of Jefferson Highway. This 90 cfs (120 cfs ultimate) pump station with a 48’ open cut discharge forcemain placed down Colonial Heights Road and over the Mississippi River levee. Other project features consist of a discharge dolphin in the Mississippi River and upsizing of the Jefferson Highway drainage crossings and downstream conveyance. This recommended alternative provides the greatest pumping capacity while requiring the least amount of permanent drainage servitudes.

Mr. Curson worked with the civil and hydraulic engineering staff to develop GIS shapefiles for inclusion into the model. He also mobilized to the field identifying catch basins, inlets, manholes and other drainage features, which he grabbed coordinates for and uploaded into the model. Finally, Mr. Curson developed project alternatives in GIS and provided conceptual level design in CAD.

Clearview Drainage Pump Station, St. Peter’s Ditch Improvements – Phase 4, Jefferson Parish, LA.

MSMM engineering staff provided complete design services for a 220 cfs drainage pump station located within the DOTD Right-of-Way of the Clearview Parkway/Earhart Expressway interchange. The goal of this pump station was to pump stormwater runoff from the existing detention pond network, over Cross Canal, and discharge directly into the improved St. Peter’s Ditch (box culvert). The project required multiple disciplines including civil, structural, electrical and mechanical engineering, as well as, cost estimating and drafting (CAD). The pump station structure contained three 75 cfs vertical lift pumps with 250 HP motors and several hundred feet of 36” discharge piping. Additional features of the project included a pile supported reinforced concrete structure, sheetpile intake area, trash rake with conveyor, conditioned control building, generator, traffic detour plan, discharge pipe aerial canal crossing, utility relocations, and other related improvements.

Mr. Curson was the lead CAD designer for the project. He worked with civil, structural, electrical and mechanical engineers to develop the project design and supply of all drawings.

Woodlake Estates/Seton Park Subdivision Drainage Pump Station, Jefferson Parish, LA

MSMM was tasked by the Jefferson Parish council to evaluate drainage pump station alternatives to solve the issue of long-term flooding in within the Woodlake and Seton Park neighborhoods within the City of Kenner. In 2018, MSMM completed a feasibility study that developed multiple drainage pump station alternatives which bypass the capacity limitations of the canals and alleviate stormwater flooding in the area. At the completion of the feasibility report, the following alternatives were identified:

INDIVIDUAL CONSULTANT:

Name & Title:

Eric M. Curson

Design Manager

- A new drainage pump station at the corner of Canal 17 and Canal 7 (west end of Joe Yenni Blvd.), a discharge forcemain westwards, with a discharge basin in the West Return Canal.
- A new drainage pump station at the northeast corner of Vintage Drive and Platt Street on Canal 17, a discharge forcemain westwards, with a discharge basin in the West Return Canal.
- A new inline drainage pump station at or near the corner of Canal 17 and Canal 7 with discharge into the canals and also with a discharge forcemain westwards to a discharge basin in the West Return Canal

Mr. Curson worked with the civil and hydraulic engineering staff to develop GIS shapefiles for inclusion into the model. He also mobilized to the field identifying catch basins, inlets, manholes and other drainage features, which he grabbed coordinates for and uploaded into the model. Finally, Mr. Curson developed project alternatives in GIS and provided conceptual level design in CAD.

Jefferson Parish Inflow & Infiltration System Modeling, Jefferson, LA

MSMM modeled wastewater collection network piping involving 225 sewer pump stations, more than 8,000 sewer manholes, 200 miles of gravity piping, and 200 miles of forcemains. Field inspection of all modeled stations was performed to conduct pump tests and determine current station capacities. GPS surveys were conducted to determine exact coordinates of manholes and wet wells. The data was updated in the GIS database, which was then utilized in the InfoWorks modeling software to determine the network's reaction to various design storms, and to quantify inflow and infiltration (I&I) problems. The model results identified SSO areas that matched closely with known customer complaints, sewer overflow records, and knowledge of O&M staff. The model was subsequently utilized to test and optimize system improvements, which were utilized by local planning authorities for long term master planning.

Mr. Curson was tasked with running the technical side of the program and routinely meets with GIS and Engineering personnel from Jefferson Parish to provide updates on data gaps/needs, priority projects and the potential for database improvements. He has been involved in the creating of this data set and database since before he was employed by MSMM. He continues to refine the data and database for planning use by Jefferson Parish.

Soniat Canal Improvements (SELA), Jefferson Parish, LA.

Federally funded project under the Southeast Louisiana Urban Flood Control (SELA) program that involved improving drainage along a major north-south running drainage canal via hydraulic studies, DDRs, design, geotechnical investigations, preparation of plans and specifications, construction management and resident inspection. This project increased the capacity of Soniat Canal from Canal No. 3 to West Metairie Avenue in Metairie, LA from 3,000 cfs to 5,200 cfs. This involved designs for U-shaped concrete flumes, utility relocations, and sheet piling transitions in seven separate bid packages:

1. Canal No. 3 to Veterans Memorial Boulevard –750' in length, lined with concrete flume;
2. Veterans Memorial Boulevard vehicular bridge replacement – 300' in length with three box culverts (each 18'H x 36'W);
3. Veterans Memorial Boulevard to West Napoleon Boulevard – 3,500' total length, lined with concrete flume;

INDIVIDUAL CONSULTANT:

Name & Title:

Eric M. Curson

Design Manager

4. West Napoleon Avenue vehicular bridge replacement – 400' in length;
5. West Napoleon Avenue to Lynette Drive – 1,100' long;
6. Lynette Drive to Lester Street – approx. 2,900' long;
7. Lester Street to West Metairie Avenue – approx. 450' long with bridge replacement.

Mr. Curson provided all drafting work for the features of this project. He also worked with the engineering staff to develop figures and diagrams to present to Parish personnel and the public.

Avenue D Drainage Improvements, Jefferson Parish, LA.

Design of a drainage project (funded in part by LADOTD Statewide Flood Control), in highly urbanized neighborhood, including the upgrade of approximately 20,000 lf of storm drainpipe (15" – 96") and relocating approximately 10,000 lf of (6" – 48") waterlines and 8" sanitary sewer. Entire road was reconstructed as part of the project. The Project was divided into six (6) phases generally described as follows:

Phase I, Installation of 54", 72" and 78"x122" arch pipe along 8th Street between Avenue C and Gaudet Drive, and 54" and 60" drain line along Allo Street between 6th Street and 8th Street. (Construction Complete)

Phase II-A, Installation of 54"x88", 72", 62"x102" and 2 – 10'x7' box culverts along Avenue D between the Westbank Expressway and 6th Street. (Construction Complete)

Phase III, Installation of 54" and 60" drain line along Avenue A, 60" and 72" along Avenue C, and 48" and 54" along Gaudet Drive between 6th Street and 8th Street. (Construction on-going)

Phase IV, Installation of 48" drain line along Allo Street and Avenue C between 4th Street and 6th Street. (Design on-going)

Phase V, Installation of 42" and 48" drain line along Gaudet Drive and 48" and 54" along Avenue A between 4th Street and 6th Street. (Future Phase)

Phase VI, Installation of 72" RCP on 7th Street between Avenue B and Avenue C.

Mr. Curson provided all drafting services associated with the multiple phases of this project. He worked with multiple engineering personnel from various disciplines to draft and revise all drawings created for this project.

TEC Professional Services Questionnaire

INDIVIDUAL CONSULTANT:	
Name & Title:	John M. Domingue Construction Inspector
Project Assignment:	Field Data Collection
Name of Firm with which associated:	MSMM ENGINEERING, LLC
Years' experience with this Firm:	7 (2015)
Education: Degree(s)/Year/Specialization:	N/A
Active registration: Year first registered/discipline:	N/A
Other experiences and qualifications relevant to the proposed Project:	<p>Mr. John Domingue has more than 12 years of experience in construction management, resident inspection, administration, resident project representation, site assessment, inspection and quality control representation of projects in the Greater New Orleans area. He has worked on infrastructure projects such as flood control, water resources, roads, bridges, water, sanitary sewer, gas and electrical, as well as environmental projects including marsh restoration. Mr. Domingue has worked closely with local government officials from the City of New Orleans, City of Westwego, City of Gretna and St. Tammany Parish during construction of these projects as presented below:</p> <p><u>Bayou Segnette State Park Improvements, Jefferson Parish, LA</u> MSMM is under contract with CPRA to perform all engineering services for five (5) areas of work, including playground improvements, boat launch improvements, culvert replacement, cabin roadway improvements, and bridge improvements. Implementation of the project was required as sea level rise and lack of routine maintenance had left a portion of the State Park unusable to the public. The design team was tasked with complete engineering services inclusive of topographic survey, preparation of a full design package, including drawings and specifications, coordination with the client for bidding construction administration, and resident inspection services for all areas of work. The playground and boat launch components were designed as stand-alone construction packages, and each construction package was released for bid 3-4 months apart to stagger the construction area. Mr. Domingue is currently providing the Resident Inspection for the boat launch portion of the project.</p> <p><u>Hurricane Isaac CDBG Disaster Recovery Funding Program Management, St. Tammany Parish, LA</u> Construction of roadways and utilities for a planned academic campus, stormwater detention pond, and a Cultural Arts District, all funded by HUD/CDBG Disaster Recovery program. Specific project tasks included HUD/Davis Bacon labor compliance, resident inspection and reporting of construction activities, development, update and review of project schedule, NEPA documentation (ERR), and coordination with HUD and local</p>

INDIVIDUAL CONSULTANT:

Name & Title:

John M. Domingue
Construction Inspector

municipality. Total amount of funding was \$10,915,000. Specific Role: Construction management, resident inspection, monitoring daily construction activities, review project plans and specs, writing daily field reports, coordinating with project manager and project engineer on any problems encountered during construction, HUD labor compliance interviews.

North Galvez Street Road Improvements, New Orleans, LA Complete street and utility replacement on North Galvez Street between Elysian Fields and Almonaster (9 city blocks). Associated project elements included street restoration, water and sewer relocation, and gas and fiber optic line relocation. Specific Role: Construction management, conducting on-site observations of work in progress, reviewing contract plans and specs, writing daily reports, monitoring daily activities, coordinating with project manager and project engineer on any problems encountered during construction.

Western Closure Complex Pumping Station, Jefferson, LA for US Army Corps of Engineers

Project was construction of concrete T-walls for flood protection on Peter's Road (Sector gate). Mr. Domingue performed construction management duties for the project, and was responsible for knowledge of construction concepts, principles and practices applicable to a full range of duties concerned. Observed and investigated construction as all stages to identify problems, report potential problems and take action on potential issues in a timely fashion. In charge of enforcement of contractor inspections on multiple sites, and responsible for making sure all personnel in compliance with the plans and specs. At the end of the project, performed a final inspection to make sure the final product met the expectation of both the client and contractor.

Construction Administrator, Mandeville, LA Primary responsibilities include the management of daily activities including management of the field staff, plans and specs compliance, review and progress completion schedule processes, and serving as the direct link between the project owner and the contractor with regards to monitor methodology and quality control.

Resident Project Inspector, Westwego, LA Primary responsibilities were monitoring the methodology and construction adherence to roadway specs. Heavy emphasis was places on roadway materials and re-routing of underground facilities. Primary duties included observing and inspecting all aspects of the construction from structural steel and concrete in foundations, to framing, electrical, HVAC and finishes, punch lists and following everything through to closeout.

TEC Professional Services Questionnaire

L. Work by Firm or Joint-Venture members which best illustrates current qualifications relevant to this Project. Please include any and all work performed for Jefferson Parish. Please attach additional pages if necessary.

PROJECT NO. 01

Project Name, Location and Owner's contact information:	Nature of Firm's Responsibility:	
<p>USACE Silver Jackets Program Jefferson Parish Infrastructure and Watershed Master Plan Development</p> <p>USACE New Orleans District</p> <p>Nik Richard, USACE Project Manager 504-862-2411</p> <p>Michelle Gonzales, CFM – Director, Ecosystem and Coastal Management 504-736-6653</p>	<p>MSMM recently developed the Jefferson Parish Watershed Management Master Plan. Development of the Jefferson Parish Watershed Management Master Plan, (WMP) gave MSMM the dual opportunities of assisting parish leadership in developing strategies to prepare the drainage system for future sea level rise and of assisting the parish residents in lowering their flood insurance rates. Working through the US Army Corps of Silver Jackets program, MSMM provided lead assistance in the ongoing process of acquiring National Flood Insurance Program (NFIP) credit for developing the WMP as part of the Community Rating System (CRS).</p>  <p>The NFIP considers a WMP to be the result of a hydrologic and hydraulic study of the watershed using a hydrograph approach, examining both existing and future development conditions, and under different management scenarios. For CRS credit it must model at least the 100-year fully developed watershed at a scale sufficient to determine local problems. Utilizing the parish's existing SWMM models, MSMM adjusted input parameters for rising sea levels, changing storm patterns as projected in the NOAA Atlas 14 rain models, and changing development plans as projected in the Jefferson Parish future land use plan. The output from this modeling effort was then quantified in terms of water surface elevation changes.</p> <p>Utilizing modeling results, FEMA CRS guidance criteria, Jefferson Parish planning studies, input from the parish, and MSMM broad experience from previous drainage and flood studies; a series of recommended watershed management strategies were developed. These recommendations ranged from proposed implementation of standard low impact development principles, such as use of permeable pavements and bio-swales, to specific unique recommendations for Jefferson Parish watershed management regarding pump maintenance considerations, generation capacity and levee resiliency planning.</p>	
Completion Date (actual or estimated):	Estimated Cost (in thousands):	
	Entire Project	Work for which Firm was Responsible:
2021	\$180	\$180

TEC Professional Services Questionnaire

L. Work by Firm or Joint-Venture members which best illustrates current qualifications relevant to this Project. Please include any and all work performed for Jefferson Parish. Please attach additional pages if necessary.

PROJECT NO. 02

Project Name, Location and Owner's contact information:	Nature of Firm's Responsibility:	
<p>Louisiana Intermodal Terminal – Port of New Orleans, Chalmette, LA</p> <p>Port of New Orleans/AECOM</p> <p>Jonathan McDowell, PE (504) 450-9905</p> 	<p>MSMM was tasked with developing an existing conditions Hydrologic and Hydraulic model for the new Port of New Orleans located in St. Bernard Parish. The site contains approximately 450 acres and will be utilized as an intermodal facility with ship, barge, rail, and truck traffic. The existing storage areas were modeled as subbasins in the HEC-HMS Version 3.5 (USACE 2010) and the 10-, 2-, 1-, and 0.2-percent annual chance event discharges for these recurrence intervals were directly input as flow hydrographs at corresponding locations in the hydraulic models.</p> <p>The hydrologic analyses for this project used rainfall runoff modeling using HEC-HMS to develop flow hydrographs which were used in unsteady HEC-RAS models. The final hydrograph output was a flow hydrograph as opposed to a single flow value. Therefore, rather than provide tables with the flow hydrograph information at various locations, the user is referred to the digital HEC-HMS model output that contains all the flow hydrograph discharges.</p> <p>Utilizing the selected alternative for the Proposed Full-Build Terminal Design facility and infrastructure plans, MSMM will develop a “Proposed Conditions SWMM Model” that includes proposed drainage features (location/size of pump stations, detention pond sizing, major canals, major culverts) necessary for the Full-Build Terminal Design. MSMM will make modifications to the Proposed Conditions SWMM Model to determine solutions to drainage problems within the studied area such that the post-development drainage flow stage, peak and volume characteristics are the same as the predevelopment drainage characteristics. The modifications will include alternate solutions for storm routing (including hydraulic grade line analysis), proper sizing of detention basins, pumping adjustments including supplemental pumping at existing stations and construction of additional pumping facilities to Violet Canal and the Mississippi River.</p>	
Completion Date (actual or estimated):	Estimated Cost (in thousands):	
	Entire Project	Work for which Firm was Responsible:
2022	\$425	\$425

TEC Professional Services Questionnaire

L. Work by Firm or Joint-Venture members which best illustrates current qualifications relevant to this Project. Please include any and all work performed for Jefferson Parish. Please attach additional pages if necessary.

PROJECT NO. 03

Project Name, Location and Owner's contact information:

Nature of Firm's Responsibility:

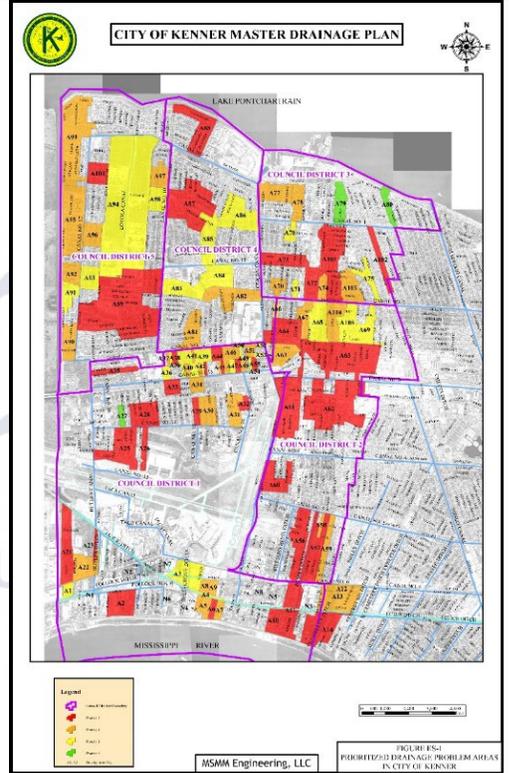
Drainage Master Plan Development, Kenner, LA

City of Kenner Department of Public Works

**Tom Schreiner, Director
(504) 468-7515**

MSMM's principals created the GIS system for the entire City of Kenner subsurface drainage infrastructure that included 304 miles of pipes and culverts, 14,511 individual pipe/culvert segments, and 13,000 drain inlets and catch basins, and managed the database for quick retrieval. As part of developing this information for the Kenner Master Drainage plan project, our staff also characterized the drainage system via field inspections and Hydraulic Modeling utilizing the EPA SWMM. MSMM personnel were previously involved in developing drainage planning documents, inclusive of the City of Kenner Drainage Master Plan completed in April of 2010. Several of the projects identified in that plan were subsequently constructed. However, several drainage projects remained so this report was developed to prioritize recommended subsurface drainage improvement projects on a Council District based by identifying ten (10) highest priority project in each Council District.

At the completion of this analysis, the City of Kenner received a compiled report that identified the highest priority projects, along with cost estimates, maps, and recommended drainage piping information. The recommended pipe sizing was based on a ten (10) year storm design standard. The Hydraulic Modeling for this Master Plan update was completed in a similar format to recent Hydraulic Modeling changes performed by Jefferson Parish. The end result was a list of drainage projects that will compete for available funding.



Completion Date (actual or estimated):

Estimated Cost (in thousands):

Entire Project

Work for which Firm was Responsible:

2018

\$120

\$120

TEC Professional Services Questionnaire

L. Work by Firm or Joint-Venture members which best illustrates current qualifications relevant to this Project. Please include any and all work performed for Jefferson Parish. Please attach additional pages if necessary.

PROJECT NO. 04

Project Name, Location and Owner's contact information:

Nature of Firm's Responsibility:

South Kenner Pump to the River Feasibility Study, Kenner, LA

Jefferson Parish Drainage Department

**Mitch Theriot, PE, Director
(504) 736-6751**



For this project, MSMM provided key modeling and coordination roles for developing the South Kenner Pump to the River Feasibility Study. Examining the feasibility of the project gave our engineering staff the opportunity to assist Parish leadership in advancing a concept which has been considered a “no-go” strategy in previous studies. Utilizing a knowledge base of the storm drain system and the canal-pump station system that has been developed through years of working with Kenner and the Parish on drainage problems in the area, MSMM was able to leverage their knowledge base and analytical skills to develop a plan that resurrected the Pump to the River (PTR) concept as a viable strategy for decreasing flood stages over a broad area of Kenner and unincorporated Jefferson Parish.

The modeling effort for this study involved analysis of the South Kenner EPA SWMM model and performing hydrology and hydraulic analyses utilizing the HEC-HMS and HEC-RAS models approved by FEMA and the Army Corps of Engineers. These models were used to identify runoff volume and storm flood stages expected in the watershed of the Duncan Canal and Soniat Canal. The Harahan Pump-to-the-River system was added to the HEC-RAS “Jefferson East Bank HSDRRS Project Model” so the model would reflect the projected pump conditions that would exist when the Kenner PTR system would be brought online. Rigorous modeling efforts culminated in the finding that a significant area of flooding could be reduced by extending the conveyance system to the larger reach of the Duncan Canal. In terms of value as measured by the cost of canal and pump station per of volume of water removed from the system, the PTR system was found to provide significant economies because of the short distance of conveyance to the river when compared to the long distance and multiple constrictions involved in conveyance to Lake Ponchartrain.

Completion Date (actual or estimated):

Estimated Cost (in thousands):

Entire Project

Work for which Firm was Responsible:

2014

\$150

\$150

TEC Professional Services Questionnaire

L. Work by Firm or Joint-Venture members which best illustrates current qualifications relevant to this Project. Please include any and all work performed for Jefferson Parish. Please attach additional pages if necessary.

PROJECT NO. 05

Project Name, Location and Owner's contact information:	Nature of Firm's Responsibility:	
<p align="center"> Coventry Court Drainage Evaluation Feasibility Modeling Report and Subsurface Design River Ridge, LA </p> <p align="center"> Jefferson Parish Drainage Department </p> <p align="center"> Mitch Theriot, PE – Drainage Director (504) 736-6751 </p> 	<p>In early 2017 and following repetitive street flooding in the Coventry Court area of River Ridge, MSMM Engineering worked with the Jefferson Parish District 2 office to propose a solution to the flooding issues in the area. The MSMM engineering team identified several potential options that could be evaluated, and in 2018 the Jefferson Parish Council tasked our staff with developing a multi-phase feasibility report to evaluate several drainage solutions in the area. As part of the Coventry Court evaluation, the Jefferson Parish drainage department requested that MSMM investigate and determine the feasibility of providing improved drainage. The investigation consisted of the following:</p> <ul style="list-style-type: none"> - Evaluation Phase/Data Review – collection and analysis of existing information - Field Reconnaissance and Preliminary Survey – collection of relevant field information - Model Runs and Calibration – updated the HEC-RAS model with the area's data for 10-year, 50-year and 100-year storm events. - Cost Estimating of Multiple Alternatives – provided detailed cost breakouts consisting of vendor furnished pricing data for materials - Development of a Prioritized List of Recommendations <p>The final report was completed in less than 6 months, and the final recommendation was to design a new drainage pump station on a vacant parcel owned by the parish between Coventry Court and Lee Court, westerly of Jefferson Highway. This 90 cfs (120 cfs ultimate) pump station with a 48' open cut discharge forcemain placed down Colonial Heights Road and over the Mississippi River levee. Other project features consist of a discharge dolphin in the Mississippi River and upsizing of the Jefferson Highway drainage crossings and downstream conveyance. This recommended alternative provides the greatest pumping capacity while requiring the least amount of permanent drainage servitudes.</p>	
<p align="center">Completion Date (actual or estimated):</p>	<p>Estimated Cost (in thousands):</p>	
	<p>Entire Project</p>	<p>Work for which Firm was Responsible:</p>
<p>2018</p>	<p>\$299</p>	<p>\$299</p>

TEC Professional Services Questionnaire

L. Work by Firm or Joint-Venture members which best illustrates current qualifications relevant to this Project. Please include any and all work performed for Jefferson Parish. Please attach additional pages if necessary.

PROJECT NO. 06

Project Name, Location and Owner's contact information:	Nature of Firm's Responsibility:	
<p>Woodlake Drainage Pump Station Hydraulic Modeling and Preliminary Design, Kenner, LA</p> <p>Jefferson Parish Drainage Department</p> <p>Mitch Theriot, PE – Drainage Director (504) 736-6751</p> 	<p>The Woodland Estates & Seton Park subdivision areas are located at the confluence of Canal 7 and Canal 17 in Kenner. The current drainage system consists of an enclosed gravity storm sewer system that outlets at various locations in the canals. The distance the stormwater within the canal must travel before it is pumped is excessive (nearly 2 miles to the Duncan Canal Pump Station and 2.25 miles to the Parish Line Pump Station). Due to the excessive distance, the water within the canal typically backs up, creating an increased head situation where the gravity drainage pipes are unable to discharge as intended. This generates a backwater flow condition which causes repeated flooding in the area. Because of the existing conditions in the area, MSMM completed a drainage evaluation report that evaluated options for removing the backflow condition in this area.</p> <p>The subsurface drainage was modeled with the US EPA Storm Water Management Model (SWMM) and the canals and pump station utilized the River Analysis System (HEC-RAS) software. The HEC-RAS model conducted existing condition and other simulation under design storms of 10-year, 50-year and 100-year intensities. The resulting conditions were utilized for comparison purposes. The alternate iterations result in varying degrees of water surface lowering and flooding reduction. Extents of improvement projects, associated cost opinions, and required ancillary items such as right of way acquisitions, etc. were considered to select the most optimum combination which will provide the most flooding reduction. The modeling process indicated that both the subsurface drainage system and high-water elevations in the canal during a 10-year storm event are contributing to flooding issues in the project area. The recommendation was made to construct an in-line 120 cfs drainage pump station directly benefiting the two neighborhoods, as the pump station will be the new outlet, therefore no longer relying on the canal system. This alternative will indirectly benefit the entire area by removing the runoff created from these subdivisions from entering the canal system, therefore freeing up canal capacity from other areas.</p>	
Completion Date (actual or estimated):	Estimated Cost (in thousands):	
	Entire Project	Work for which Firm was Responsible:
2018	\$225	\$225

TEC Professional Services Questionnaire

L. Work by Firm or Joint-Venture members which best illustrates current qualifications relevant to this Project. Please include any and all work performed for Jefferson Parish. Please attach additional pages if necessary.

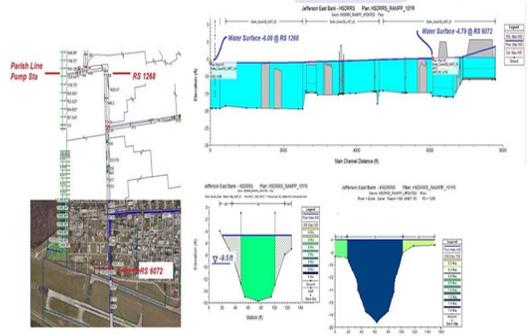
PROJECT NO. 07

<p>Project Name, Location and Owner's contact information:</p>	<p align="center">Nature of Firm's Responsibility:</p>	
<p>New Orleans International Airport Taxiway Golf and Delta Extension, Kenner, LA</p> <p>New Orleans Aviation Board</p> <p>James McCluskie (504) 464-0831</p> 	<p>MSMM provided extensive hydraulic modeling, engineering design and construction administration services for the extension of Taxiway Golf and Taxiway Bravo at the New Orleans International Airport. Taxiway G will serve the new terminal facility opened on the north side of the airport. In its current condition, Taxiway G does not extend to the Runway 11 threshold, and aircraft departing from Runway 11 are required to cross the active runway at Taxiway A to access Runway 11. Extending Taxiway G will provide much more efficient access to the Runway 11 threshold, and aircraft will no longer be required to cross an active runway to depart from Runway 11. Project design elements MSMM completed/assisted with included the following:</p> <ul style="list-style-type: none"> • Hydraulic Modeling – Design of the storm sewer system was based on the EPA SWMM methodology. Pipes were designed to flow full for the 5-year storm event and to provide one-foot freeboard below the inlet grate for the 10-year storm event for a free outfall condition. Some freeboard exceptions were made in the upper end of the storm sewer where the pipes to be employed by the system are existing and dual flow of storm sewer and ditch may occur along the vehicle service road. Freeboard exceptions will also occur in portions of the median area impounded by Taxiway G, Taxiway Ult. G2, Runway 11-29, and Taxiway Ult. G3 (now Taxiway A) where the existing ground and grates to remain in the system currently do not provide freeboard. Tailwater values at the canal outfalls were based on stage-frequency relationships extracted from the Parish HEC-RAS model. • Drainage Design – Storm drainage design for the medians and infields, a culvert crossing for Taxiway B, channel stabilization design for Canal 15, and adjustments of the Airport Intake Canal to accommodate the vehicle service road relocation. <p>The project was bid in late 2020 and as of March 2022 is currently in construction where MSMM is performing construction admin services.</p>	
<p>Completion Date (actual or estimated):</p>	<p align="center">Estimated Cost (in thousands):</p>	
<p align="center">2022</p>	<p align="center">Entire Project</p> <p align="center">\$900</p>	<p align="center">Work for which Firm was Responsible:</p> <p align="center">\$900</p>

TEC Professional Services Questionnaire

L. Work by Firm or Joint-Venture members which best illustrates current qualifications relevant to this Project. Please include any and all work performed for Jefferson Parish. Please attach additional pages if necessary.

PROJECT NO. 08

Project Name, Location and Owner's contact information:	Nature of Firm's Responsibility:	
<p align="center">New Orleans International Airport North Terminal Comprehensive Hydraulic and Hydrologic Modeling Study, Kenner, LA</p> <p align="center">New Orleans Aviation Board</p> <p align="center">Chris Spann, Program Manager (913) 940-1301</p> 	<p>MSMM performed the hydraulic and hydrologic aspect of the North Terminal Expansion Project at the New Orleans International Airport. MSMM adopted the existing hydraulic models such as the 1992 Jefferson Parish UNET model, the 2005 Corps of Engineers HEC-RAS model, and the 2012 Jefferson Parish HEC-RAS model and supplemented them with recent field and record data, creating the new 2013 Airport hydraulic model. From this it was determined the airport would mitigate its peak rate of discharge to include all previous improvements from 1992 to the present. This was commonly known as “Catch-up Mitigation”. The difference from the peak runoff from 1992 to the peak runoff from the 2013 conditions as well as the improvements from the North Terminal Expansion were used to size the new drainage pump station along with the drainage conveyance systems for both airside and landside drainage. MSMM worked with airport personnel to determine different mitigation options including on-site pumping, on-site storage or capacity enhancements to Parish owned pumping facilities. MSMM completed a comprehensive analysis of existing as-builts from projects completed at the airport since 1992; completed a field walk-through investigation to inventory existing drainage features; collected data for model calibration; completed a hydrology analysis of the storm sewer system for both the 1992 and 2013 conditions and completed a storm sewer hydraulic grade line analysis. As a result, MSMM prepared numerous Hydraulic and Hydrologic studies including the Phase 1 North Terminal Expansion, Catch-up Mitigation, Phase 2 North Terminal Expansion, Parking Garage Upgrades and the North Wooded Area. MSMM utilized the model to design airside and landside drainage features including more than five miles of drainage piping ranging in sizes from 12” to 72”, open channels, box culverts, and the connection to the Butler Canal box culvert, and a new 600 CFS drainage pump station.</p>	
<p align="center">Completion Date (actual or estimated):</p>	Estimated Cost (in thousands):	
	Entire Project	Work for which Firm was Responsible:
2016	\$500	\$500

TEC Professional Services Questionnaire

L. Work by Firm or Joint-Venture members which best illustrates current qualifications relevant to this Project. Please include any and all work performed for Jefferson Parish. Please attach additional pages if necessary.

PROJECT NO. 09

Project Name, Location and Owner's contact information:	Nature of Firm's Responsibility:	
<p align="center"> Mirabeau Garden Stormwater Management and Flood Mitigation Modeling City of New Orleans Department of Public Works Megan Williams Stormwater Program Manger 504-658-8065 </p>	<p>The Mirabeau Gardens Green Infrastructure project involved the intake of water from the Mirabeau trunk line into the project site via a forebay, followed by pumps, vegetated filtration ponds, freshwater swimming pool, woodlands, washes and bioswales, recreational, educational and sports amenities, and eventual discharge into the Mirabeau trunk line. Downstream discharge into Mirabeau trunk line is planned for storms exceeding 10-year intensity, while for all lesser intensity storms, the stormwater will be stored and infiltrated within the site.</p> <p>During the design stage, MSMM conducted hydrologic and hydraulic (H&H) modeling, derived model predicted flood depths, and mapped flooded areas and flood depths. This data was utilized by FEMA to calculate benefit-cost ratio (BCR) of the project. MSMM's H&H model efforts and deliverables proved to be key elements that facilitated BCR of greater than 1.0. Our evaluation utilized both SWMM and HEC-RAS models, reviewed and reconciled the elevation parameters, evaluated the interconnectivity and the numerical model flows between 2 storm sewer systems (DPS03 & DPS04), reviewed information on calibration and model adjustments that were made to derive expected depth of flow in the storm sewers adjacent to the project, SWMM model data, developed stormwater flow rate and volume at multiple drainage nodes around the subject site for 2-year, 5-year, 10-year, and 100-year storms, developed maps of modeled drainage nodes, developed profiles of modeled storm drains, calculated drainage area acreages and prepared maps. We also developed drainage sub-basin delineation maps to facilitate analysis of backwater in the storm drains acting as 'upstream' areas, and relationship of drainage area boundaries to the status of flow within the storm sewer. Based on our modeling efforts, the project was full designed and will be constructed in 2022.</p>	
<p>Completion Date (actual or estimated):</p> <p align="center">2021</p>	<p align="center">Estimated Cost (in thousands):</p>	
	<p align="center">Entire Project</p> <p align="center">\$900</p>	<p align="center">Work for which Firm was Responsible:</p> <p align="center">\$180</p>



TEC Professional Services Questionnaire

M. List all prior and/or on-going litigation between Firm and Jefferson Parish. Please attach additional pages if necessary.

Parties:		Status/Result of Case:
Plaintiff:	Defendant:	
Not Applicable	Not Applicable	Not Applicable

N. Use this space to provide any additional information or description of resources supporting Firm’s qualifications for the proposed project.

MSMM Engineering, LLC (MSMM) is one of the fastest growing small businesses in the greater New Orleans area. Specializing in drainage infrastructure assessment and design, MSMM offers experienced personnel with an extremely diverse skill set. MSMM engineers total over 150 years of design experience and combined have designed over 250 projects for Jefferson Parish. The principals of MSMM alone have designed over two hundred Jefferson Parish projects. We are extremely proficient in providing feasibility/drainage phase, design phase, and construction phase services for drainage infrastructure projects.

Given the scope detailed in the solicitation, MSMM’s modeling and drainage design acumen can be clearly seen through the list of recently completed assessment, modeling, and design (drainage-related) projects listed below:

- Jefferson Parish Watershed Management Plan
- Evaluation of Coventry Court Drainage
- Evaluation of the Woodlake Drainage Pump Station
- New Orleans International Airport Taxiway G Extension Hydraulic Analysis
- Sauvé Road Drainage Improvements
- Drainage Pump Station Design, New Orleans International Airport, Kenner, LA
- Kenner Statewide Flood Control Drainage Improvements
- Harahan Pump to the River, Jefferson Parish, LA
- Clearview Drainage Pump Station
- Soniat Canal Drainage Improvements (USACE/SELA project)
- Sena Drive Drainage Improvements
- Complete reconstruction of Aubry Street in New Orleans including drainage
- Design for Additional Pump at the Parish Line Pump Station

1. Professional Training and Experience in Relation to the Type of Work Required for the Engineering Services:

MSMM is currently completing a large-scale Watershed Management Plan for Jefferson Parish that includes extensive watershed modeling. This collaborative effort completed through the USACE New Orleans District is an important dual hatted program for the Parish as it helps identify drainage deficiencies while subsequently providing National Flood Insurance Program criteria for the possibility of benefitting Parish residents. The objective of this FEMA watershed master planning project is to provide Jefferson Parish with a framework to make decisions that will result in decreased losses from flooding. Based on FEMA recommended criteria, the Watershed Management Plan presents an analysis of the existing and future conditions on over 50-percent of

the Parish inside the levees for 10-year, 25-year, and 100-year storm events using a hydrograph approach based on EPA SWMM model analysis. SWMM models of the Jefferson East bank Polder and the Catouatche Polder were analyzed individually. The combined area of the two polders exceeded the “inside the levee” area criteria of 50-percent. Comparative future conditions were assessed using Technical Paper 40 versus NOAA Atlas 14 rainfall intensity predictions and using current sea level versus NOAA’s 2100 intermediate Sea Level Rise Projection which anticipates a 5.8-foot rise in sea level. Future land use was based on the newly updated Jefferson Parish Edge 2040 land use information. Parish EPA SWMM numerical hydrologic-hydraulic models were used in assessing impacts.

The model analysis indicated that the existing pump system has sufficient capacity to maintain near-present water surfaces despite rising sea levels, but the percent utilization and power usage are increased so that maintenance wear and tear, and power provisions should be considered. Considering storm intensity revisions as standard rain intensities are adjusted from historic Technical Paper 40 intensities to the more current NOAA Atlas 14, the values Jefferson Parish uses for 10- and 25-year storms already exceed NOAA Atlas 14 storm intensities. However, the 100-year NOAA storm is 1.4-inches greater than the Technical Paper 40 value used such that associated water surface impacts should be considered to avoid future revision of the flood plain mapping. The storm water surface impacts due to development in the Catouatche Polder were found to be substantial if the area is built out to the future land use plan without mitigation or canal and pump capacity upgrades. Based on the findings of the SWMM model analyses, recommendations for future development and redevelopment are addressed to ensure that peak stages for the 10-year, 25-year, and 100-year storm events are not increased.

MSMM is also the sole entity to envision, develop and evaluate this Coventry Court Drainage Pump Station project. On the sixth day of June 2018, MSMM was selected under Resolution #131571 to provide professional engineering services for a drainage analysis of the Coventry Court area of River Ridge. The drainage analysis (feasibility report) was completed in December of 2018, with our staff recommending design of a new drainage pump station to be placed on a vacant parcel owned by the parish between Coventry Court and Lee Court, westerly of Jefferson Highway in River Ridge. The pump station will be 90 cfs (120 cfs ultimate) and will have discharge pipe (48’ open cut discharge force main) placed down Colonial Heights Road and over the Mississippi River levee. Other project features of the conceptual design consist of a discharge dolphin in the Mississippi River and upsizing of the Jefferson Highway drainage crossings and downstream conveyance. This recommended alternative provides the greatest pumping capacity while requiring the least amount of permanent drainage servitudes within the neighborhood.

MSMM was selected under an amendment to our Coventry Court contract to provide subsurface drainage design phase for the Coventry Court project. For this component of the project, our civil and structural engineers are currently designing 500 linear feet of 48” RCP drainpipe from Rex to Hazel Street, 1,100 linear feet of 54” RCP drainpipe from Hazel to Colonial Heights, and 200 linear feet of 72’ RCP drainpipe from Jefferson Highway to the proposed site of the drainage pump station. This drainage design is the first step in the Coventry Court drainage pump station process and allows this phase of the design to move forward as utility conflicts and permitting for this phase, may take more time. Drainage connections to the easterly side of Jefferson Highway will eventually be cut-off and a distinct drainage district will be created in the Coventry Court neighborhood. The drainage improvements currently under design by MSMM will be a critical step in routing water to the pump station for discharge over the levee and into the Mississippi River.

We are one of the most knowledgeable firms about subsurface drainage in general, and Jefferson Parish drainage in particular. Since the beginning of the SELA program, MSMM's Principal Mr. Manish Mardia has been involved with large scale canal improvement and pump station projects in Jefferson Parish (Harahan Pump to the River, and Soniat Canal improvements). MSMM has modeled, designed, and provided construction inspection and management on several subsurface drainage improvement projects in Kenner (Jefferson Parish), analyzed the entire drainage system of the New Orleans International airport in Jefferson Parish, and conducted complete design of the 600 cfs airport drainage pump station that was recently constructed. The airport drainage work required MSMM to conduct hydraulic modeling, which included the entire east bank of Jefferson Parish, and included recent SELA improvements as well. MSMM's principals also analyzed the entire subsurface drainage system of a prominent Jefferson Parish community (Kenner) through the Woodlake and Seton Park drainage evaluation. We have developed a feasibility study for the community, conducted hydraulic modeling, and applied for a state grant to implement the drainage improvements. Furthermore, Mr. Mardia managed several phases of the Harahan Pump to the River project, and Mr. Chehardy was the designer of record of multiple phases of the project. Mr. Wilson was the designer of record for the Sauv  Road drainage pump station and the new drainage pump station at the airport. Mr. Willis has provided all the hydraulic modeling for each of the MSMM projects and is currently the lead POC for the Parish on the Watershed Masterplan Work.

Given the qualifications listed above, our engineering staff are extremely familiar with the region's drainage infrastructure in general, Jefferson Parish's drainage infrastructure, and the soil characteristics that impact design decisions, pose constructability issues, and factor into permitting.

2. Capacity for Timely Completion of Newly Assigned Work, considering the Factors of Type of Engineering Task, Current Unfinished Workload, and Person or Firm's Available Professional and Support Personnel:

MSMM prides itself in completing projects on time and under budget. Since the inception of MSMM, our staff engineers have completed over one hundred design projects, including multiple drainage pump stations (as detailed above). We have also experience utilizing SWMM, HEC-RAS and HEC-HMS models that will be instrumental in the development of this project. Having prior knowledge of running these models for the Parish and meeting deadlines will be critical for any firm. Waiting to win the contract, acquiring the software and training staff will not be a successful strategy for this project, and our staff currently runs these programs daily, and can be seen in the chart below, has ample availability to continue serving the needs of the Parish. Our engineering staff have designed/worked on more than *two hundred projects for various Jefferson Parish departments*. These projects were successfully completed within the identified schedule and met the quality standard Jefferson Parish expects in design performance. The Jefferson Parish references identified in the response to question #7 can attest to the quality standard and timely completion of Parish projects by MSMM and our personnel. Please reach out to them to gain a better understanding of our firm abilities/accomplishments.

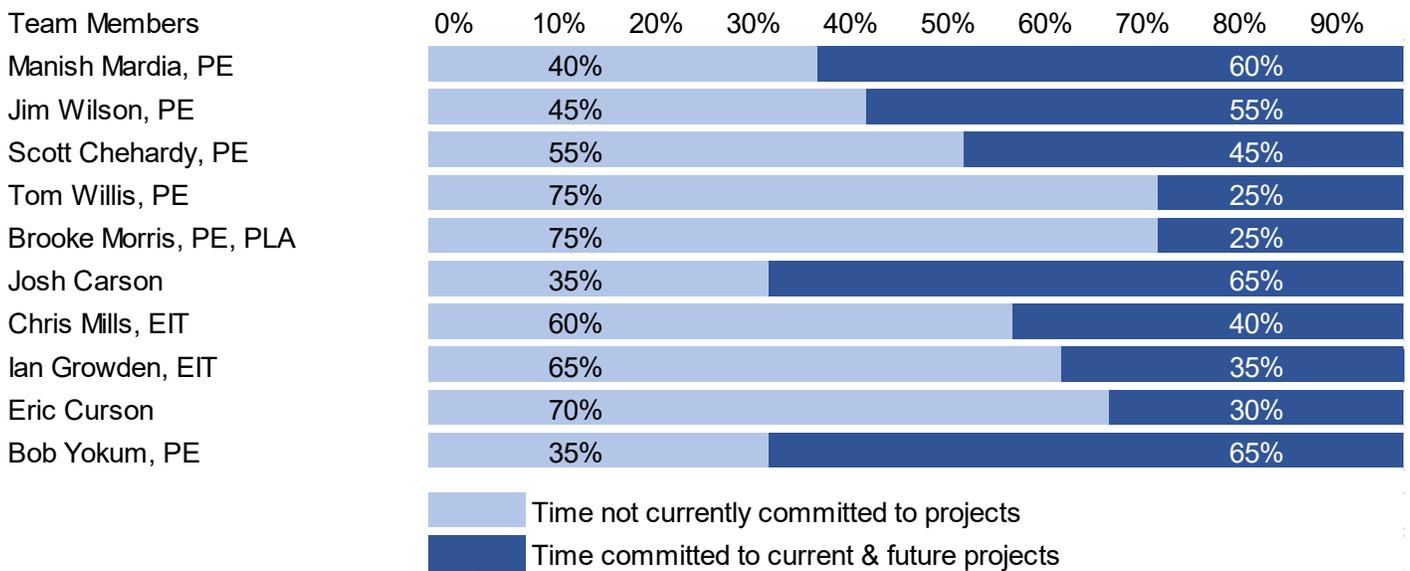
MSMM's current project load allows ample flexibility in our staffing arrangements to ensure that completion of the field and modeling work associated with this project is completed on time and within budget. We recently wrapped up four of our largest design jobs, one being the large drainage pump station at the New Orleans International Airport, and the other three were large design task orders for USACE Ft. Worth where we designed an office building, a roadway and bridge project and a large recreational project. These four jobs encompassed most of our engineering resources over the last 2 years. With these jobs now finished, we have

started to allocate our engineering resources to smaller jobs, and they have ample availability in their current schedules for a new project. In addition, the other large design jobs we currently have ongoing for USACE (Cow Bayou Drainage Complex, Ascension Parish Wastewater Treatment Plant, and design for a new floodwall in Texas City, TX) have moved past the preliminary design phase and final design will be completed before the end of the year. Additionally, the larger Jefferson Parish Watershed report has been finalized and provided to the Parish and USACE, so our modeling staff also has ample availability currently. Given the nature of our current workload, our engineering design and support staff availability is shown in the following table:

Current Workload and Future Commitments

The bar graph below depicts the availability of the proposed key personnel for this project

TEAM AVAILABILITY BY PROJECT



3. Location of Principal Office Where Work Will be Performed:

All work associated with this project will take place out of the MSMM office located at 4508 Clearview Parkway, Metairie, LA 70006.

4. Adversarial Legal Proceedings between the Parish and the Person or Firm Performing Professional Services, in which the Parish prevailed, or any ongoing Proceedings between Parish and the Person or Firm:

MSMM is proud to state that **neither the firm nor our staff have been involved in any litigation activity with Jefferson Parish** or any other client.

5. Prior Successful Completion of Projects of the Type and Nature of the Engineering Services, as Defined, for which firm has Provided Verifiable References:

We offer the following references that can attest to our previous work history regarding hydraulic modeling utilizing SWMM and HEC-RAS modeling, along with the appropriate fieldwork it will require to supply accurate data to the model.

For recent Jefferson Parish drainage projects completed by MSMM inclusive of: Jefferson Parish Watershed Master Planning, Coventry Court Drainage Evaluation, Sauv  Road Drainage Pump Station Design, Woodlake/Seton Park Drainage Evaluation, New Orleans International Airport Drainage Pump Station Design, Kenner Statewide Flood Control Drainage Improvements, Harahan Pump to the River, Clearview Drainage Pump Station, Soniat Canal Drainage Improvements (USACE/SELA project), and Sena Drive Drainage Improvements, we offer the following references:

- **Mitch Theriot, P.E., Director of Drainage Department • Jefferson Parish • 1221 Elmwood Park Blvd., Ste. 907, Jefferson, LA. 70123 • 504-736-6751**
- **Michelle Gonzales, CFM Director of Ecosystem and Coastal Management • Jefferson Parish • 1221 Elmwood Park Blvd., Ste. 310, Jefferson, LA. 70123 • 504-736-6653**
- **Neil Schneider, P.E., Director of Capital Projects • Jefferson Parish • 1221 Elmwood Park Blvd., Ste. 906, Jefferson, LA. 70123 • 504-736-6833**
- **Walter Krygowski, Deputy Director, and Chief Operations Officer • New Orleans International Airport • 504-303-7551**

For recent projects we have designed that have involved detailed hydraulic modeling, permitting with DOTD, CPRA, the Coast Guard and levee lifts/re-design and bike path/utilities relocation for the USACE New Orleans District:

- **Mark R. Wingate, P.E., Deputy District Engineer for Programs and Project Management (DPM) • US Army Corps of Engineers, New Orleans District • 504-862-2512**
- **Durund Elzey, Assistant Deputy District Engineer for Programs and Project Management (DPM) • US Army Corps of Engineers, New Orleans District • 504-862-1674**

6. Size of Firm, considering number of Professional and Support Personnel Required to Perform the type of Engineering Tasks:

MSMM has a total of twenty-eight personnel that will be available to work on this project. Though labeled as a small DBE firm, our modeling and engineering qualifications rival those of larger firms in the region. We were selected by the USACE Ft. Worth and New Orleans Districts for Prime small business contracts to perform A-E Design and Project and Program Management on Federal projects. We have also received a prime engineering design contract by the RTA of New Orleans. Finally, were ranked the top small business firm for roadway design in the region by the City of New Orleans Department of Public Works. Recently in Jefferson Parish, we have primarily provided hydraulic modeling services for various projects. These modeling reports have been widely successful and have been reviewed and approved by top Parish officials.

When beginning any new job, MSMM launches a QA/QC template that assigns personnel based on experience, location, and availability. This plan is developed by the Project Manager and reviewed by the Program

Manager before any tasks are executed on the project. MSMM employs a QA/QC manager who not only reviews the quality of the design but engages in forecasting available resources based on the current workload at the company. The QA/QC manager works in unison with the project manager to guarantee that MSMM is providing quality work products and ample capacity to add resources to the job, should the scope change during design.

For this project, we envision the standard need for the Program Manager, QA/QC manager and Project Manager. We will also assign 2 Hydraulic Engineers, 2 Civil Engineers, a CAD drafter/woman, 1 GIS lead, and two engineers in training who will be responsible for the management, collection and dissemination of new field information that will supply the model with accurate data. The resources available may be too many for the type of work involved, but this is all factored into how MSMM will run the project through our QA/QC plan.

Mr. Tom Willis will be the primary hydraulic modeler for this project. He has recent relevant modeling experience in the Parish and is currently completing the Jefferson Parish Watershed Management Plan where he is actively working with Ms. Michelle Gonzales, FEMA, and the US Army Corps of Engineers to supply the Parish with a usable watershed plan. He was also the lead modeler for multiple MSMM drainage task orders at the New Orleans International Airport, where he was responsible for determining appropriate drainage mitigation measures for multiple infrastructure components. Mr. Willis is extremely proficient in using EPA SWMM, HEC-RAS and HEC-HMS modeling software to complete model runs and brings over 30 years of modeling experience to Jefferson Parish for this project.

7. Past Performance by Person of Firm on Parish Contracts:

Our engineering staff have been the designer of record for seven (7) recent drainage pump stations in Jefferson Parish and Texas. Of the recent pump stations completed in Jefferson Parish, our engineering staff were the designer of record for 5 (five of those stations). Mr. Jim Wilson was the designer of record for the recent six hundred cfs drainage pump station at the New Orleans International Airport, as well as the Sauvé Road Drainage Pump Station that was also constructed in River Ridge. Mr. Scott Chehardy was the designer of record for the Clearview Drainage Pump station and for multiple packages of the Harahan Pump to the River project. Mr. Chehardy and Mr. Manish Mardia were also heavily involved in recent updates to the Parish Line Pump Station. As stated above, Mr. Tom Willis has been the hydraulic modeler on several of these drainage pump station projects and has identified drainage pump stations as the best mitigation method from his modeling runs. As you can see, MSMM is highly qualified to perform the required services for this project and has recent similar project experience that proves our capability to successfully complete this project.

Since the early 1990s, the President of MSMM Engineering, LLC has worked *on more than two hundred projects for various departments of Jefferson Parish*. Project types designed by MSMM engineering staff include drainage evaluation/pump stations, roads and bridges, stormwater and wastewater system assessment, funding and construction administration, environmental site assessments, permitting and NEPA documentation, and hurricane hazard mitigation design for drainage and sewerage facilities. MSMM's Principals have worked on Jefferson Parish contracts for the past 20 years and have a history of successful project execution starting from grant applications, through environmental permitting and design, to construction administration and grant management. At no point during the 20+ year career of producing project plans and specifications has any member of MSMM been involved in projects involving design inadequacies,

cost over-runs or assertions of fault. This statement can be verified by checking with the references listed in the response to Question #5.

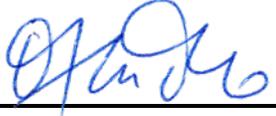
A listing of other (not previously covered in this RFQ response) Jefferson Parish projects completed by MSMM engineering staff:

- Utility (Sewer) Relocations – Huey P. Long Bridge Widening
- 31st Street Bridge Replacement
- Hilltop to Quitman Bridge Replacement
- Manhattan Boulevard Rehabilitation from Lapalco to Harvey
- Lapalco Boulevard Widening
- Hickory Avenue (LA-48 to Mounes)
- Harahan Pump to the River, Jefferson Parish, LA
- Soniat Canal Drainage Improvements (USACE/SELA project)
- Drainage Pump Station Design, New Orleans International Airport, Kenner, LA
- Storm Water Demonstration Project, Force Main & East Bank Wastewater Treatment Plant Expansion, Jefferson Parish, LA.
- Sena Drive Drainage Improvements
- Sauvé Road Drainage Improvements
- Canal 7 Drainage Improvements at Chateau Boulevard and Joe Yenni Boulevard
- East Bank Subsurface Drainage Improvement Program Phases I and II
- Drainage Evaluation of Canal Nos. 17 and 7, and Parish Line Pump Station
- Environmental Review for Hurricanes Gustav and Ike CDBG Disaster Recovery grant projects
- Infiltration/Inflow Hydraulic Modeling, Jefferson Parish, LA
- Chetta Drive Gravity Sewer System, Jefferson Parish, LA
- East Bank Water Treatment Plant Expansion, Jefferson Parish, LA
- Wastewater Treatment Plant Modifications, including Sewer Force Main (Tribune to East Bank WWTP), Jefferson Parish, LA
- Sewerage Improvements to the Crown Point Area, Jefferson Parish, LA
- Drainage Design Services for the Long-Term Airport Development, New Orleans International Airport, Kenner, LA



Concept design of the MSMM Hydraulic Modeling Results for the Woodlake Pump Station

O. To the best of my knowledge, the foregoing is an accurate statement of facts.

Signature: 

Print Name: Manish Mardia, PE

Title: President

Date: March 18, 2022

BFM CORPORATION, LLC TEC QUESTIONNAIRE

TEC Professional Services Questionnaire

A. Project Name and Advertisement Resolution Number:

Professional Engineering and Supplemental Services for a
Drainage Master Plan for the East Bank of Jefferson Parish
 SOQ **22-014** | Resolution No. **138896**

B. Firm Name & Address:



BFM
 CORPORATION, LLC
 Professional Land & Hydrographic Surveying

BFM Corporation, LLC
 15 Veterans Memorial Boulevard
 Kenner LA 70062

C. Name, title, & contact information of Principal, as defined in Section 2-926 of the Jefferson Parish Code of Ordinances, who is a registered, licensed architect, professional engineer, or surveyor in the State of Louisiana:

Chad M. Poché, P.E., Executive Vice President
 504-468-8800 • 504-460-5239 cell • cpoche@bfmcorporation.com
 Registered Professional Civil Engineer, Louisiana No. 27667 (since 1998)

D. Name, title, & contact information of employee who is a registered and licensed architect, professional engineer, or surveyor in the State of Louisiana in the applicable discipline. A subcontractor may be substituted here only if the advertised Project requires more than one discipline.

Ralph P. Fontcuberta, Jr., Executive Vice President • LA License No. 4329 (1974)
 504-468-8800 • 504-451-7500 cell • ralph@bfmcorporation.com
 Registered Professional Land Surveyor, Louisiana No. 4329 (since 1974)

E. Please provide the number of employees whose primary function corresponds with each category:

4	Administrative	-	Estimators	-	Specification Writers
-	Architects (Licensed)	-	Geologists	-	Structural Engineers
-	Chemical Engineers	1	Geotechnical Engineers	-	Graduate Engineers
-	Civil Engineers	-	Interior Designers	2*	Project Managers
-	Construction Inspectors	-	Landscape Architects	-	Clerical (<i>see Administrative</i>)
-	Ecologists	-	Land Surveyor (<i>see PLS</i>)	-	Grant/Funding Specialist
-	Electrical Engineers	-	Mechanical Engineers	-	Sanitary Engineers
-	Engineer Intern	-	Environmental Engineers	1	Principals
2	Professional Land Surveyors			1	Researcher/Archivist
				3	Drafting/AutoCADD
				5	Survey Crew Chiefs
				6	Instrument Men
				24	TOTAL

* Project Manager also noted in Professional Land Surveyor, but overall employee count is correct.

F. Is this submittal by a JOINT-VENTURE? Please check: YES _____ NO X

If marked "No", skip to Section I. If marked "yes", complete Sections G-H.

TEC Professional Services Questionnaire

G. If submittal is by a JOINT-VENTURE, list the firms participating and outline specific areas of responsibility (including administrative, technical, and financial) for each firm. please attach additional pages if necessary.

1. **N/A**

2.

**H. Has this JOINT-VENTURE previously worked together? Please check:
YES _____ NO _____ N/A**

I. List all subcontractors anticipated for this Project. Please note that all subcontractors must submit a fully completed copy of this questionnaire, applicable licenses, and any other information required by the advertisement. See Jefferson Parish Code of Ordinances, Sec. 2-928(a)(3). Please attach additional pages if necessary.

Name & Address:	Specialty:	Worked with Prime Before (Yes or No):
1. N/A		
2.		
3.		

J. Please specify the total number of support personnel that may assist in the completion of this Project:

24 (all personnel, primary and support, will be available on all assigned projects)

TEC Professional Services Questionnaire

K. List the professional in charge, key persons, specialists, and individual consultants anticipated for this Project and provide their relevant information below. If necessary, please attach additional documentation (i.e., résumé) that demonstrates the employment history of the Firm's key persons that may assist in the completion of this Project. Please attach additional pages if necessary.

PROFESSIONAL IN CHARGE OF PROJECT:

Name & Title:

Ralph P. Fontcuberta, Jr., PLS
Executive Vice President

Project Assignment:

Registered Professional Land Surveyor

Name of Firm with which associated:

BFM CORPORATION, LLC
Professional Land & Hydrographic Surveying

Years experience with this Firm:

40 years (Founding Principal of BFM in 1982); 55 years total (1967)

Education: Degree(s)/Year/Specialization:

Coursework, Building, Delgado College, New Orleans
Coursework, Math, University of New Orleans

Active registration: Year first registered/discipline:

1974, Professional Land Surveyor (Louisiana Lic. No. 4329)
1974, Professional Land Surveyor (Mississippi Lic. No. 1633)

Other experience and qualifications relevant to the proposed Project:

Ralph P. Fontcuberta, Jr., PLS has better than half a century of experience in the field of surveying and has been a registered Professional Land Surveyor (PLS) since 1974. He is thoroughly knowledgeable in all aspects of surveying: topographic, hydrographic, boundary, right-of-way surveying, and all facets thereof. He has provided surveying services for residential, plant, and industrial layout projects, ranging from small private lots & buildings to multi-million dollar programs, including the New Orleans FEMA Streets/Recovery Roads Program.

Since the beginning of his career, his work has entailed computations, drafting, and field work for various industrial, commercial, municipal, and private clients. Project work has included topographic surveying needed for a wide variety of engineering, architectural, and related endeavors.

TEC Professional Services Questionnaire

Other experience and qualifications relevant to the proposed Project:

Ralph P. Fontcuberta, Jr., PLS (continued)

Mr. Fontcuberta's **surveying experience with Jefferson Parish can be traced back to BFM's inception in 1982**, and before then while working as a surveyor with another firm. He has over half a century of experience with surveying throughout the region and **specifically with Jefferson Parish**. He has served as the PLS for projects throughout every corner of Jefferson Parish. Relevant project history includes, but is certainly not limited to, the following:

- *Bissonet Plaza Drainage Improvements (Phase 1, Elmwood Parkway and Craig Avenue), Metairie, Jefferson Parish, LA*
- *Lapalco Boulevard Bridge at Harvey Canal, (PW 2017-046-RBP; DOTD H.004396), Jefferson Parish, LA*
- *Orange Lane Drainage Pump Station Project (Drainage Mapping), Grand Isle, Jefferson Parish, LA*
- *Mounes Street Subsurface Drainage (Phase IV, Dickory Avenue to Elmwood Park Boulevard), Jefferson Parish, LA*
- *West Bank Expressway, Phase I Drainage Map, from Peters Road to Manhattan Boulevard, Jefferson Parish, LA*
- *West Bank Subsurface Drainage Improvement Project, Phase II, Bellemeade Boulevard to the Violet Canal Discharge, Jefferson Parish, LA*
- *Avenue D Drainage Improvements (Phase VIII: Allo Street), Metairie, Jefferson Parish, LA*
- *Coventry Drainage Pump Stations, Jefferson Parish, LA*
- *Metairie Road Drainage Evaluation, Metairie, Jefferson Parish, LA*
- *Mounes Subsurface Drainage – Phase I, Jefferson Parish, LA*
- *Jack & Bores Survey (Drainage Project), Waggaman, Jefferson Parish, LA*
- *Oakwood Terrytown Drainage Improvements (HMGP) (Carol Sue Drainage Improvements), Jefferson Parish, LA*
- *Drainage Improvements, Metairie Lawn to Labarre Drive, Jefferson Parish, LA*
- *Mary Ridge Court, Jefferson Parish, LA*
- *Bannerwood Drainage Improvements (Mt. Laurel Bridge & Oakwood Canal), Jefferson Parish, LA*
- *Orleans Village Subdivision Drainage Improvements, Jefferson Parish, LA*
- *Westgate Subdivision Subsurface Drainage Improvements, Jefferson Parish, LA*
- *Kawanee Drive Drainage Improvements, Jefferson Parish, LA*
- *Paillet – Maplewood Drainage Improvements, Jefferson Parish, LA*
- *Hoey's Canal Drainage Improvements (Deckbar Ave to Labarre Rd), Jefferson Parish, LA*
- *25th Street & Adjacent Canal, Gretna, Jefferson Parish, LA*
- *Mason Ditch Drainage Improvements, Jefferson Parish, LA*
- *Breaux Ditch Improvements, East Ames Boulevard – Leo Kenner Parkway, Jefferson Parish, LA*
- *Drainage Improvements to the Canal No. 11 Culvert Crossing West of Duncan Canal, Jefferson Parish, LA*
- *Mazoue Ditch Drainage Improvements (Rose Crest Lane to Darby Lane), Jefferson Parish, LA*
- *Ames Boulevard Drainage Pump Station Warehouse, Jefferson Parish, LA*
- *Improvements to Bayou Segnette Drainage Pump Station No. 1, Jefferson Parish, LA*
- *Cleary Avenue & West Napoleon Lift Station & Force Main, Jefferson Parish, LA*
- *Westwego Drainage Pump Station No. 1, Jefferson Parish, LA*
- *Parish Line Pump Station No. 5, Kenner, Jefferson Parish, LA*
- *Hero Pump Station, Harvey, Jefferson Parish, LA*
- *Fulton Street Pump Station, Jefferson Parish, LA*
- *Westwego Drainage Pump Station 1, Westwego, Jefferson Parish, LA*
- *Goose Bayou Drainage Pump Station, Lafitte, Jefferson Parish, LA*
- *Taft Park Drainage Pump Station, Jefferson Parish, LA*
- *Drainage Pump Station, Veterans North & South, Right-of-Way, 17th Street Canal, Jefferson Parish, LA*
- *Drainage Pump Station, West Esplanade and 17th Street Canals, Jefferson Parish, LA*
- *Bayou Segnette Fronting Protection/New Pump Station, Westwego, Jefferson Parish, LA*
- *Morton & Ingrid Pump Station, Jefferson Parish, LA*

TEC Professional Services Questionnaire

KEY PERSON, SPECIALIST, OR INDIVIDUAL CONSULTANT:

Name & Title:

Chad M. Poché, P.E.
Executive Vice President

Project Assignment:

Engineering Liaison

Name of Firm with which associated:

BFM CORPORATION, LLC
Professional Land & Hydrographic Surveying

Years experience with this Firm:

5 years (became partial owner of BFM in 2017); 29 years total (1993)

Education: Degree(s)/Year/Specialization:

M.S., 1998, Civil Engineering, University of New Orleans
B.S., 1993, Civil Engineering, Louisiana State University

Active registration: Year first registered/discipline:

Louisiana, Civil Engineer, No. 27667, 1998
Mississippi, Civil Engineer, No. 15405, 2002

Other experience and qualifications relevant to the proposed Project:

Mr. Poché is an Executive Vice President with (and partial owner of) BFM Corporation, LLC, and a co-founder of BFM's sister company, Gulf South Engineering and Testing, Inc. He has been a consulting geotechnical engineer for more than 20 years in South Louisiana, working on traditional and unique geotechnical engineering projects (shallow and deep foundation design, slope stability, pavement design, etc.). Mr. Poché has also provided construction oversight for waste facilities and virtually every type of earthwork related project. He has been the geotechnical engineer of record for thousands of projects throughout his career.

Mr. Poché's experience includes the development of appropriate scopes of work and proposals for a broad range of projects; planning and coordinating analyses; preparing technical reports; foundation and geotechnical engineering design; construction recommendations; Miss. River facility permitting; managing personnel and office operations; and expert witness testimony. Mr. Poché has logged soil borings; overseen the installation of ground water monitoring wells, piezometers, and inclinometers; overseen and evaluated pile load tests; overseen, performed, and evaluated dynamic pile testing (PDA and PIT); performed CMT field testing and inspection; and performed laboratory testing.

BFM Corporation projects overseen by Mr. Poché would include:

TEC Professional Services Questionnaire

Other experience and qualifications relevant to the proposed Project:

Chad M. Poché, P.E. (continued)

Lapalco Boulevard Bridge at Harvey Canal, (PW 2017-046-RBP; DOTD H.004396), Jefferson Parish, LA. BFM Corporation provided extensive surveying services for a topographic survey and right-of-way (R/W) determination for the project. Project elements included setting GPS Static Control (5 permanent control points), traversing a proposed survey line, and land topography surveying. Additional phases include hydrographic topography/bathymetric surveying of the project area, the right-of-way determination, and subsurface utility engineering (SUE). Drone Surveying was utilized throughout the project. A Route Topographic Survey was also included as part of the scope, as was Subsurface Utility Engineering (SUE). (\$478,744 (fee); 2020)

Bissonet Plaza Drainage Improvements (Phase 1), Metairie, Jefferson Parish, LA. BFM prepared a Route Topographic Survey for Phase 1 of the project, located at Elmwood Parkway and Craig Avenue. This project built upon work executed by the firm for a previous extensive surveying project involving Bissonet Plaza subdivision; this allowed for BFM to build upon established surveys to save time and expenses. Surveying for each element of the project included services included confirming all controls and benchmarks, topographic features, location of improvements and utilities, location of natural elements as applicable, and notation of right-of-way points. (\$7,980 (fee); 2020)

Orange Lane Pump Station Project, Grand Isle, Jefferson Parish, LA. The project consists of a new storm water pumping station on the intersection of Orange Lane at Orleans Avenue in Grand Isle, Louisiana. The scope of services includes obtaining topographical survey information and the preparation of a drainage map for the project. Phase 1 of the project involved the topographic and right of way surveying services; BFM conducted a site topographic survey at the proposed lift station site and provided boundary surveying to determine rights of way. Phase 2 of the project established the Drainage Map. BFM located all drainage structures within the Limits of Survey; this included ditches, culverts, drain inlets, and catch basins. A drone survey was executed to gather a 25 ft elevation grid throughout the project area. (\$32,280 (fee); 2020)

Metairie Road Drainage Evaluation, Metairie, Jefferson Parish, LA. BFM provided surveying services for this Drainage Evaluation Project (PW 2018-024-DR). The scope of services included a full Route Topographic Survey (includes all services, utilities, properties, elevations and items necessary to perform any and all engineering and construction work) from gutter line to gutter line along Metairie Road from the westerly apparent right-of-way (R/W) of Causeway Boulevard to easterly apparent ROW of Focis Street. The project encompassed approximately 10,400 linear feet, with cross-sections and elevations surveyed included as part of the scope. (\$18,350 (fee); 2020)

Avenue D Drainage Improvements (Phase VIII: Allo Street), Metairie, Jefferson Parish, LA. BFM executed a Route Topographic Survey for the project; the full scope plan & profile included all services, utilities, properties, elevations and items necessary to perform any and all engineering and construction work. The project area (Allo Street) extended from 4th Street to 6th Street. (\$12,855 (fee); 2019)

Holly Drive Drainage Project, Lewisburg Estates Subdivision, Mandeville, St. Tammany Parish, LA. BFM provided boundary with topographic surveying of the project site (multiple lots) in the Lewisburg Estates Subdivision for the drainage project. (\$13,392 (fee); 2019)

TEC Professional Services Questionnaire

KEY PERSON, SPECIALIST, OR INDIVIDUAL CONSULTANT:

Name & Title:

John Philip Thayer
Field Operations Supervisor

Project Assignment:

Field Operations Supervisor

Name of Firm with which associated:

BFM CORPORATION, LLC
Professional Land & Hydrographic Surveying

Years experience with this Firm:

14 years (joined BFM in 2008); 15 years total (2007)

Education: Degree(s)/Year/Specialization:

B.S., 2007, Physical Education, Trevecca Nazarene University

Active registration: Year first registered/discipline:

Professional Land Surveyor Registration in process, State of Louisiana

Other experience and qualifications relevant to the proposed Project:

Mr. Thayer is a Field Operations Supervisor with considerable experience in field surveying services, including ALTA/as-built surveying, construction layout, boundary, topographic, cross-sections, GPS use, and numerous other surveying types.

West Bank Subsurface Drainage Improvement Project, Phase II, Bellemeade Boulevard to the Violet Canal Discharge, Jefferson Parish, LA. BFM provided topographic surveying for the project, which encompassed Bellemeade Boulevard from Briargrove to Brookmeade and Brookmeade from Bellemeade to the Violet Canal Discharge. (\$16,108 (fee); 2010)

Mounes Street Subsurface Drainage (Phase IV, Dickory Avenue to Elmwood Park Boulevard), Jefferson Parish, LA. BFM provided topographic surveying services for Phase IV of the project, part of a multiphase program to improve drainage issues on Mounes Street. Phase IV of the project involved a topographic survey of the project, extending from Dickory Avenue to Elmwood Park Boulevard. Services provided by BFM included establishment of a baseline, setting temporary benchmarks (TBMs), elevation surveys, locating improvements and utilities as well as natural elements, and right-of-way surveying. (\$23,540 (fee); 2017)

Avenue D Drainage Improvements (Phase VIII: Allo Street), Metairie, Jefferson Parish, LA. BFM executed a Route Topographic Survey for the project; the full scope plan & profile included all services, utilities, properties, elevations and items necessary to perform any and all engineering and construction work. The project area (Allo Street) extended from 4th Street to 6th Street. (\$12,855 (fee); 2019)

TEC Professional Services Questionnaire

Other experience and qualifications relevant to the proposed Project:

John Philip Thayer (continued)

Lapalco Boulevard Bridge at Harvey Canal, (PW 2017-046-RBP; DOTD H.004396), Jefferson Parish, LA. BFM Corporation provided extensive surveying services for a topographic survey and right-of-way (R/W) determination for the project. Project elements included setting GPS Static Control (5 permanent control points), traversing a proposed survey line, and land topography surveying. Additional phases include hydrographic topography/bathymetric surveying of the project area, the right-of-way determination, and subsurface utility engineering (SUE). Drone Surveying was utilized throughout the project. A Route Topographic Survey was also included as part of the scope, as was Subsurface Utility Engineering (SUE). (\$478,744 (fee); 2020)

Bissonet Plaza Drainage Improvements (Phase 1), Metairie, Jefferson Parish, LA. BFM prepared a Route Topographic Survey for Phase 1 of the project, located at Elmwood Parkway and Craig Avenue. This project built upon work executed by the firm for a previous extensive surveying project involving Bissonet Plaza subdivision; this allowed for BFM to build upon established surveys to save time and expenses. Surveying for each element of the project included services included confirming all controls and benchmarks, topographic features, location of improvements and utilities, location of natural elements as applicable, and notation of right-of-way points. (\$7,980 (fee); 2020)

Metairie Road Drainage Evaluation, Metairie, Jefferson Parish, LA. BFM provided surveying services for this Drainage Evaluation Project (PW 2018-024-DR). The scope of services included a full Route Topographic Survey (includes all services, utilities, properties, elevations and items necessary to perform any and all engineering and construction work) from gutter line to gutter line along Metairie Road from the westerly apparent right-of-way (R/W) of Causeway Boulevard to easterly apparent ROW of Focis Street. The project encompassed approximately 10,400 linear feet, with cross-sections and elevations surveyed included as part of the scope. (\$18,350 (fee); 2020)

Orange Lane Pump Station Project, Grand Isle, Jefferson Parish, LA. The project consists of a new storm water pumping station on the intersection of Orange Lane at Orleans Avenue in Grand Isle, Louisiana. The scope of services includes obtaining topographical survey information and the preparation of a drainage map for the project. Phase 1 of the project involved the topographic and right of way surveying services; BFM conducted a site topographic survey at the proposed lift station site and provided boundary surveying to determine rights of way. Phase 2 of the project established the Drainage Map. BFM located all drainage structures within the Limits of Survey; this included ditches, culverts, drain inlets, and catch basins. A drone survey was executed to gather a 25 ft elevation grid throughout the project area. (\$32,280 (fee); 2020)

Louisiana Statewide Flood Control Program (Package 1 & 2 Control and Package 3), City of Kenner, LA. BFM provided topographic surveying services for the project. Typical surveying elements included records research, establishment of baseline, Temporary Benchmarks, and shooting of elevations. BFM provided surveying for the location of improvements and utilities (sewer, water, drainage, storm, etc.), as well as natural elements in the project area. The Louisiana Statewide Flood Control Program uses state funds in the construction of flood control infrastructure to reduce (or eliminate) the incidence of flooding or damages in a specific area. (\$17,688 (fee); 2016)

TEC Professional Services Questionnaire

KEY PERSON, SPECIALIST, OR INDIVIDUAL CONSULTANT:

Name & Title:

Gary J. Lambert, Jr., PLS
Registered Professional Land Surveyor

Project Assignment:

Registered Professional Land Surveyor; Project Manager/Drafting Supervisor

Name of Firm with which associated:

BFM CORPORATION, LLC
Professional Land & Hydrographic Surveying

Years experience with this Firm:

4 years (joined BFM in 2018); 11 years total

Education: Degree(s)/Year/Specialization:

B.S., 2018, Geomatics, Nicholls State University
B.S., 2014, Construction Management, Louisiana State University

Active registration: Year first registered/discipline:

2021, Professional Land Surveyor (Louisiana Lic. No. 5929)

Other experience and qualifications relevant to the proposed Project:

Mr. Lambert provides Project Management and Drafting Oversight for the firm. He has also provided Survey Crew Chief Services since joining BFM and offers a well-rounded experience overview for any project. Mr. Lambert has completed Basic OSHA Training and holds license with the Gulf Coast Safety Council (08SSV, ID429523).

Lapalco Boulevard Bridge at Harvey Canal, (PW 2017-046-RBP; DOTD H.004396), Jefferson Parish, LA. BFM Corporation provided extensive surveying services for a topographic survey and right-of-way (R/W) determination for the project. Project elements included setting GPS Static Control (5 permanent control points), traversing a proposed survey line, and land topography surveying. Additional phases include hydrographic topography/bathymetric surveying of the project area, the right-of-way determination, and subsurface utility engineering (SUE). Drone Surveying was utilized throughout the project. A Route Topographic Survey was also included as part of the scope, as was Subsurface Utility Engineering (SUE). (\$478,744 (fee); 2020)

Avenue D Drainage Improvements (Phase VIII: Allo Street), Metairie, Jefferson Parish, LA. BFM executed a Route Topographic Survey for the project; the full scope plan & profile included all services, utilities, properties, elevations and items necessary to perform any and all engineering and construction work. The project area (Allo Street) extended from 4th Street to 6th Street. (\$12,855 (fee); 2019)

TEC Professional Services Questionnaire

Other experience and qualifications relevant to the proposed Project:

Gary J. Lambert, Jr., PLS (continued)

Bissonet Plaza Drainage Improvements (Phase 1), Metairie, Jefferson Parish, LA. BFM prepared a Route Topographic Survey for Phase 1 of the project, located at Elmwood Parkway and Craig Avenue. This project built upon work executed by the firm for a previous extensive surveying project involving Bissonet Plaza subdivision; this allowed for BFM to build upon established surveys to save time and expenses. Surveying for each element of the project included services included confirming all controls and benchmarks, topographic features, location of improvements and utilities, location of natural elements as applicable, and notation of right-of-way points. (\$7,980 (fee); 2020)

Orange Lane Pump Station Project, Grand Isle, Jefferson Parish, LA. The project consists of a new storm water pumping station on the intersection of Orange Lane at Orleans Avenue in Grand Isle, Louisiana. The scope of services includes obtaining topographical survey information and the preparation of a drainage map for the project. Phase 1 of the project involved the topographic and right of way surveying services; BFM conducted a site topographic survey at the proposed lift station site and provided boundary surveying to determine rights of way. Phase 2 of the project established the Drainage Map. BFM located all drainage structures within the Limits of Survey; this included ditches, culverts, drain inlets, and catch basins. A drone survey was executed to gather a 25 ft elevation grid throughout the project area. (\$32,280 (fee); 2020)

Metairie Road Drainage Evaluation, Metairie, Jefferson Parish, LA. BFM provided surveying services for this Drainage Evaluation Project (PW 2018-024-DR). The scope of services included a full Route Topographic Survey (includes all services, utilities, properties, elevations and items necessary to perform any and all engineering and construction work) from gutter line to gutter line along Metairie Road from the westerly apparent right-of-way (R/W) of Causeway Boulevard to easterly apparent ROW of Focis Street. The project encompassed approximately 10,400 linear feet, with cross-sections and elevations surveyed included as part of the scope. (\$18,350 (fee); 2020)

West Causeway Approach Bike Path Drainage Study, City of Mandeville, St. Tammany Parish, LA. BFM executed a Route Topographic Survey for the project area. Scope included establishing a baseline parallel to the street; establishing temporary benchmarks (TBMs) along the project baseline; locating existing improvements with the designated Limits of Survey; locating existing above-ground and underground utilities. BFM also researched available location data from controlling agencies. Cross sections were taken on a 100 ft. grid within the Limits of Survey. BFM also provided surveying services to provide a Drainage Area Map for the project. The scope of services included establishing Vertical Control and the location of existing drainage structures. (\$16,720 (fee); 2018)

Revere Road W-3 Drainage Survey, St. Tammany Parish, LA. BFM provided surveying services to the St. Tammany Parish Government (Survey Services Contract No. 16-104) for this Drainage Survey project on Revere Road. The scope of services included a boundary survey with notation of improvements. Extensive records research was a precursor to the execution of the field survey. BFM also provided cross sections of Bayou De Zaire and of the drainage feature with notation of natural ground features, improvements, encroachments, and easements/servitudes. Upon completion, BFM provided AutoCAD maps and parcel property descriptions to the Parish. (\$18,960 (fee); 2020)

TEC Professional Services Questionnaire

KEY PERSON, SPECIALIST, OR INDIVIDUAL CONSULTANT:

Name & Title:

Christopher Lemley
Quality Control Supervisor

Project Assignment:

Quality Control Supervisor

Name of Firm with which associated:

BFM CORPORATION, LLC
Professional Land & Hydrographic Surveying

Years experience with this Firm:

8 years (joined BFM in 2014); 16 years total (2006)

Education: Degree(s)/Year/Specialization:

High School Diploma

Active registration: Year first registered/discipline:

N/A

Other experience and qualifications relevant to the proposed Project:

Mr. Lemley serves as BFM's Quality Control Supervisor, overseeing all work and activity by the firm's personnel to be sure all is kept up to our exacting standards. His surveying experience includes over 8 years as a Survey Crew Chief. His survey software experience includes projects involving Trimble, Topcon, Leica, and Hypack, and has maintained and operated GPS, Auto-Level, and Total Station.

Metairie Road Drainage Evaluation, Metairie, Jefferson Parish, LA. BFM provided surveying services for this Drainage Evaluation Project (PW 2018-024-DR). The scope of services included a full Route Topographic Survey (includes all services, utilities, properties, elevations and items necessary to perform any and all engineering and construction work) from gutter line to gutter line along Metairie Road from the westerly apparent right-of-way (R/W) of Causeway Boulevard to easterly apparent ROW of Focis Street. The project encompassed approximately 10,400 linear feet, with cross-sections and elevations surveyed included as part of the scope. (\$18,350 (fee); 2020)

Drainage Improvements, Metairie Lawn to Labarre Drive, Jefferson Parish, LA. BFM provided Surveying Services for this project located in Bayou Metairie Park. (\$9,740 (fee); 2016)

Mounes Subsurface Drainage – Phase I, Jefferson Parish, LA. BFM provided topographic surveying services for Phase I of the project, which extended from Dickory to Elmwood Park Boulevard). (\$26,240 (fee); 2017)

TEC Professional Services Questionnaire

KEY PERSON, SPECIALIST, OR INDIVIDUAL CONSULTANT:

Name & Title:

Thomas O. Wright
Survey Crew Chief

Project Assignment:

Survey Crew Chief

Name of Firm with which associated:

BFM CORPORATION, LLC
Professional Land & Hydrographic Surveying

Years experience with this Firm:

14 years (joined BFM in 2008); 45 years total (1977)

Education: Degree(s)/Year/Specialization:

High School Diploma

Active registration: Year first registered/discipline:

*American Traffic Safety Service Assn. – Traffic Flagger/Control Technician/Control Supervisor
Basic OSHA Training - Completed
Transportation Work Identification Card (TWIC)*

Other experience and qualifications relevant to the proposed Project:

Mr. Wright has over 40 years of experience in surveying services, including a multitude of project types (water, wastewater, stormwater, drainage, roadway, etc.) throughout the region.

Mounes Street Subsurface Drainage (Phase IV, Dickory Avenue to Elmwood Park Boulevard), Jefferson Parish, LA. BFM provided topographic surveying services for Phase IV of the project, part of a multiphase program to improve drainage issues on Mounes Street. Phase IV of the project involved a topographic survey of the project. Services provided by BFM included establishment of a baseline, setting temporary benchmarks (TBMs), elevation surveys, locating improvements and utilities as well as natural elements, and right-of-way surveying. (\$23,540 (fee); 2017)

Massachusetts Avenue Drainage Improvements, Jefferson Parish, LA. BFM provided topographic surveying services for the project, which extended from W Napoleon Avenue to Veterans Memorial Boulevard. (\$28,515 (fee); 2009)

Coventry Drainage Pump Stations, Jefferson Parish, LA. BFM provided a Route Topographic Survey with Hydrographic Survey for the project. The limits of survey extended from r/w to r/w along Jefferson Highway. The levee and hydrographic survey area was noted as 400 feet wide (200 ft. in either direction of the extended centerline of Colonial Heights Road). Drone Surveying was a key element of the project. The hydrographic survey extended 500 feet into the river from the water's edge. (\$89,780 (fee); 2020)

TEC Professional Services Questionnaire

KEY PERSON, SPECIALIST, OR INDIVIDUAL CONSULTANT:

Name & Title:

Curtis "Jay" Barrios
Survey Crew Chief

Project Assignment:

Survey Crew Chief

Name of Firm with which associated:

BFM CORPORATION, LLC
Professional Land & Hydrographic Surveying

Years experience with this Firm:

32 years (joined BFM in 1990); 32 years total (1990)

Education: Degree(s)/Year/Specialization:

High School Diploma

Active registration: Year first registered/discipline:

*American Traffic Safety Service Assn. – Traffic Flagger
Transportation Work Identification Card (TWIC)*

Other experience and qualifications relevant to the proposed Project:

Mr. Barrios' surveying experience includes boundary, hydrographic, and topographic. He has worked on location and performed topographic surveys for a number of major projects.

West Bank Subsurface Drainage Improvement Project, Phase II, Bellemeade Boulevard to the Violet Canal Discharge, Jefferson Parish, LA. BFM provided topographic surveying for the project, which encompassed Bellemeade Boulevard from Briargrove to Brookmeade and Brookmeade from Bellemeade to the Violet Canal Discharge. (\$16,108 (fee); 2010)

Sena Drive Subsurface Drainage Improvements, Jefferson Parish, LA. BFM provided topographic surveying services for the Sena Drive Subsurface Drainage Improvements project, which extended along Sena Drive from West Esplanade Avenue (Canal No. 2) to Nero Street. (\$13,364 (fee); 2010)

Avenue D Drainage Improvements (Phase VIII: Allo Street), Metairie, Jefferson Parish, LA. BFM executed a Route Topographic Survey for the project; the full scope plan & profile included all services, utilities, properties, elevations and items necessary to perform any and all engineering and construction work. The project area (Allo Street) extended from 4th Street to 6th Street. (\$12,855 (fee); 2019)

Woodland West Subdivision Drainage Improvements, Marrero, LA. BFM provided a topographic survey for the design of drainage improvement. (\$8,900 (fee); 2006)

TEC Professional Services Questionnaire

KEY PERSON, SPECIALIST, OR INDIVIDUAL CONSULTANT:

Name & Title:

Eric Gladney
Survey Crew Chief

Project Assignment:

Survey Crew Chief

Name of Firm with which associated:

BFM CORPORATION, LLC
Professional Land & Hydrographic Surveying

Years experience with this Firm:

8 years (joined BFM in 2014); 21 years total (2001)

Education: Degree(s)/Year/Specialization:

High School Diploma

Active registration: Year first registered/discipline:

*American Traffic Safety Service Assn. – Traffic Flagger
Norfolk Southern Roadway Worker Protection Contractor Safety Cert.
Transportation Work Identification Card (TWIC)*

Other experience and qualifications relevant to the proposed Project:

Avenue D Drainage Improvements (Phase VIII: Allo Street), Metairie, Jefferson Parish, LA. BFM executed a Route Topographic Survey for the project; the full scope plan & profile included all services, utilities, properties, elevations and items necessary to perform any and all engineering and construction work. The project area (Allo Street) extended from 4th Street to 6th Street. (\$12,855 (fee); 2019)

Mounes Street Subsurface Drainage (Phase IV, Dickory Avenue to Elmwood Park Boulevard), Jefferson Parish, LA. BFM provided topographic surveying services for Phase IV of the project, part of a multiphase program to improve drainage issues on Mounes Street. Phase IV of the project involved a topographic survey of the project, extending from Dickory Avenue to Elmwood Park Boulevard. Services provided by BFM included establishment of a baseline, setting temporary benchmarks (TBMs), elevation surveys, locating improvements and utilities as well as natural elements, and right-of-way surveying. (\$23,540 (fee); 2017)

Drainage Improvements, Metairie Lawn to Labarre Drive, Jefferson Parish, LA. BFM provided Surveying Services for this project located in Bayou Metairie Park. (\$9,740 (fee); 2016)

25th Street & Adjacent Canal, Gretna, Jefferson Parish, LA. BFM provided cross section surveying and a limited drainage survey for the project. (\$2,925 (fee); 2017)

TEC Professional Services Questionnaire

KEY PERSON, SPECIALIST, OR INDIVIDUAL CONSULTANT:

Name & Title:

Jeff Patin
Survey Crew Chief

Project Assignment:

Survey Crew Chief

Name of Firm with which associated:

BFM CORPORATION, LLC
Professional Land & Hydrographic Surveying

Years experience with this Firm:

3 years (joined BFM in 2019); 23 years total (1999)

Education: Degree(s)/Year/Specialization:

High School Diploma

Active registration: Year first registered/discipline:

Transportation Work Identification Card (TWIC)

Other experience and qualifications relevant to the proposed Project:

Mr. Patin has worked as a Survey Crew Chief and Instrumentman for 20 years for a number of southeastern Louisiana surveying firms on projects throughout the region. His work history includes supervision of field crew personnel, operation of various survey equipment (Topcon GPT, Leica GPS, Total Station, etc.), calculations, information collection, and any & all work required to execute the survey and obtain the information needed. Mr. Patin has worked on projects for various public & private clients, and has performed field work under the direction of the Corps of Engineers.

Coventry Drainage Pump Stations, Jefferson Parish, LA. BFM provided a Route Topographic Survey with Hydrographic Survey for the project, located in River Ridge, Louisiana. The limits of survey extended from r/w to r/w along Jefferson Highway. The levee and hydrographic survey area was noted as 400 feet wide (200 ft. in either direction of the extended centerline of Colonial Heights Road). Drone Surveying was a key element of the project. The hydrographic survey extended 500 feet into the river from the water's edge. (\$89,780 (fee); 2020)

Metairie Road Drainage Evaluation, Metairie, Jefferson Parish, LA. BFM provided surveying services for this Drainage Evaluation Project (PW 2018-024-DR). The scope of services included a full Route Topographic Survey (includes all services, utilities, properties, elevations and items necessary to perform any and all engineering and construction work) from gutter line to gutter line along Metairie Road from the westerly apparent right-of-way (R/W) of Causeway Boulevard to easterly apparent ROW of Focis Street. The project encompassed approximately 10,400 linear feet, with cross-sections and elevations surveyed included as part of the scope. (\$18,350 (fee); 2020)

TEC Professional Services Questionnaire

KEY PERSON, SPECIALIST, OR INDIVIDUAL CONSULTANT:

Name & Title:

Anthony Watson
CADD Technician

Project Assignment:

CADD Technician

Name of Firm with which associated:

BFM CORPORATION, LLC
Professional Land & Hydrographic Surveying

Years experience with this Firm:

11 years (joined BFM in 2011); 31 years total (1992)

Education: Degree(s)/Year/Specialization:

Coursework - CAD, Avatech Solutions, Los Colinas, TX

Active registration: Year first registered/discipline:

NA

Other experience and qualifications relevant to the proposed Project:

Mr. Watson has experience as a draftsman/CADD technician, having started his career as an intern with the Surveying Department of the City of Plano, TX. His experience through the years includes manual and computer-aided drafting for a wide range of projects, ranging from small lot surveys to subdivisions to municipal treatment and private industrial plants. He has experience in all facets of surveying (boundary, topographic, ALTA/ACSM, plan & profile, etc.) in both drafting and field environments.

Mounes Street Subsurface Drainage (Phase IV, Dickory Avenue to Elmwood Park Boulevard), Jefferson Parish, LA. BFM provided topographic surveying services for Phase IV of the project, part of a multiphase program to improve drainage issues on Mounes Street. Phase IV of the project involved a topographic survey of the project, extending from Dickory Avenue to Elmwood Park Boulevard. Services provided by BFM included establishment of a baseline, setting temporary benchmarks (TBMs), elevation surveys, locating improvements and utilities as well as natural elements, and right-of-way surveying. (\$23,540 (fee); 2017)

Bissonet Plaza Drainage Improvements (Phase 1), Metairie, Jefferson Parish, LA. BFM prepared a Route Topographic Survey for Phase 1 of the project, located at Elmwood Parkway and Craig Avenue. This project built upon work executed by the firm for a previous extensive surveying project involving Bissonet Plaza subdivision; this allowed for BFM to build upon established surveys to save time and expenses. Surveying for each element of the project included services included confirming all controls and benchmarks, topographic features, location of improvements and utilities, location of natural elements as applicable, and notation of right-of-way points. (\$7,980 (fee); 2020)

TEC Professional Services Questionnaire

KEY PERSON, SPECIALIST, OR INDIVIDUAL CONSULTANT:

Name & Title:

Shaun Clements
CADD Technician

Project Assignment:

CADD Technician

Name of Firm with which associated:

BFM CORPORATION, LLC
Professional Land & Hydrographic Surveying

Years experience with this Firm:

4 years (joined BFM in 2018); 7 years total (2015)

Education: Degree(s)/Year/Specialization:

Associates of Applied Sciences, 2015, Computer Drafting and Design (ITT)

Active registration: Year first registered/discipline:

NA

Other experience and qualifications relevant to the proposed Project:

Metairie Road Drainage Evaluation, Metairie, Jefferson Parish, LA. BFM provided surveying services for this Drainage Evaluation Project (PW 2018-024-DR). The scope of services included a full Route Topographic Survey (includes all services, utilities, properties, elevations and items necessary to perform any and all engineering and construction work) from gutter line to gutter line along Metairie Road from the westerly apparent right-of-way (R/W) of Causeway Boulevard to easterly apparent ROW of Focis Street. The project encompassed approximately 10,400 linear feet, with cross-sections and elevations surveyed included as part of the scope. (\$18,350 (fee); 2020)

Avenue D Drainage Improvements (Phase VIII: Allo Street), Metairie, Jefferson Parish, LA. BFM executed a Route Topographic Survey for the project; the full scope plan & profile included all services, utilities, properties, elevations and items necessary to perform any and all engineering and construction work. The project area (Allo Street) extended from 4th Street to 6th Street. (\$12,855 (fee); 2019)

Bissonet Plaza Drainage Improvements (Phase 1), Metairie, Jefferson Parish, LA. BFM prepared a Route Topographic Survey for Phase 1 of the project, located at Elmwood Parkway and Craig Avenue. This project built upon work executed by the firm for a previous extensive surveying project involving Bissonet Plaza subdivision; this allowed for BFM to build upon established surveys to save time and expenses. Surveying for each element of the project included services included confirming all controls and benchmarks, topographic features, location of improvements and utilities, location of natural elements as applicable, and notation of right-of-way points. (\$7,980 (fee); 2020)

TEC Professional Services Questionnaire

KEY PERSON, SPECIALIST, OR INDIVIDUAL CONSULTANT:

Name & Title:

Kevin A. Roberts
CADD Technician

Project Assignment:

CADD Technician

Name of Firm with which associated:

BFM CORPORATION, LLC
Professional Land & Hydrographic Surveying

Years experience with this Firm:

4 years (joined BFM in 2018); 37 years total (1985)

Education: Degree(s)/Year/Specialization:

A.D., 1999, Drafting & Design, Louisiana Technical College
Coursework, 1994-1997, Nunez Community College
Coursework, 1984-1988, Delgado Community College
Coursework, 1982-1983, University of New Orleans

Active registration: Year first registered/discipline:

NA

Other experience and qualifications relevant to the proposed Project:

Mr. Roberts has experience with civil engineering, offshore engineering, water purification systems, and general architectural and construction design & terminology. He obtained his A.D. in Drafting in 1999, and has taken additional coursework throughout his career.

Orange Lane Pump Station Project, Grand Isle, Jefferson Parish, LA. The project consists of a new storm water pumping station on the intersection of Orange Lane at Orleans Avenue in Grand Isle, Louisiana. The scope of services includes obtaining topographical survey information and the preparation of a drainage map for the project. Phase 1 of the project involved the topographic and right of way surveying services; BFM conducted a site topographic survey at the proposed lift station site and provided boundary surveying to determine rights of way. Phase 2 of the project established the Drainage Map. BFM located all drainage structures within the Limits of Survey; this included ditches, culverts, drain inlets, and catch basins. A drone survey was executed to gather a 25 ft elevation grid throughout the project area. (\$32,280 (fee); 2020)

Holly Drive Drainage Project, Lewisburg Estates Subdivision, Mandeville, St. Tammany Parish, LA. BFM provided boundary with topographic surveying of the project site (multiple lots) in the Lewisburg Estates Subdivision for the drainage project. (\$13,392 (fee); 2019)

TEC Professional Services Questionnaire

KEY PERSON, SPECIALIST, OR INDIVIDUAL CONSULTANT:

Name & Title:

Dawn Hoffman
Researcher/Archivist

Project Assignment:

Researcher/Archivist

Name of Firm with which associated:

BFM CORPORATION, LLC
Professional Land & Hydrographic Surveying

Years experience with this Firm:

13 years (joined BFM in 2009); 25 years total (1997)

Education: Degree(s)/Year/Specialization:

A.D., 1999, Computer-Aided Drafting, Southeast College of Technology
Certificate, 2003, Introduction to ArcGIS, Louisiana State University

Active registration: Year first registered/discipline:

NA

Other experience and qualifications relevant to the proposed Project:

West Bank Subsurface Drainage Improvement Project, Phase II, Bellemeade Boulevard to the Violet Canal Discharge, Jefferson Parish, LA. BFM provided topographic surveying for the project, which encompassed Bellemeade Boulevard from Briargrove to Brookmeade and Brookmeade from Bellemeade to the Violet Canal Discharge. (\$16,108 (fee); 2010)

Bissonet Plaza Drainage Improvements (Phase 1), Metairie, Jefferson Parish, LA. BFM prepared a Route Topographic Survey for Phase 1 of the project, located at Elmwood Parkway and Craig Avenue. This project built upon work executed by the firm for a previous extensive surveying project involving Bissonet Plaza subdivision; this allowed for BFM to build upon established surveys to save time and expenses. Surveying for each element of the project included services included confirming all controls and benchmarks, topographic features, location of improvements and utilities, location of natural elements as applicable, and notation of right-of-way points. (\$7,980 (fee); 2020)

Avenue D Drainage Improvements (Phase VIII: Allo Street), Metairie, Jefferson Parish, LA. BFM executed a Route Topographic Survey for the project; the full scope plan & profile included all services, utilities, properties, elevations and items necessary to perform any and all engineering and construction work. The project area (Allo Street) extended from 4th Street to 6th Street. (\$12,855 (fee); 2019)

TEC Professional Services Questionnaire

L. Work by Firm or Joint-Venture members which best illustrates current qualifications relevant to this Project. Please include any and all work performed for Jefferson Parish. Please attach additional pages if necessary.

PROJECT NO. 1

Project Name, Location, and Owner's Contact Information:	Nature of Firm's Responsibility:	
<p>Bissonet Plaza Drainage Improvements (Phase 1, Elmwood Parkway and Craig Avenue), Metairie, Jefferson Parish, Louisiana</p> <p>Meyer Engineers Ltd. 4937 Hearst St. Ste. B Metairie LA 70001</p> <p>Ana Theriot, P.E., 504-885-9892</p>	<p>BFM prepared a Route Topographic Survey for Phase 1 of the project, located at Elmwood Parkway and Craig Avenue. This project built upon work executed by the firm for a previous extensive surveying project involving Bissonet Plaza subdivision; this allowed for BFM to build upon established surveys to save time and expenses. Surveying for each element of the project included services included confirming all controls and benchmarks, topographic features, location of improvements and utilities, location of natural elements as applicable, and notation of right-of-way points.</p>	
Completion Date (Actual or estimated):	Estimated Cost:	
	Entire Project:	Work for which Firm was Responsible:
2020 March	N/A	\$7,980 (fee)

PROJECT NO. 2

Project Name, Location, and Owner's Contact Information:	Nature of Firm's Responsibility:	
<p>Lapalco Boulevard Bridge at Harvey Canal, (PW 2017-046-RBP; DOTD H.004396), Jefferson Parish, Louisiana</p> <p>Hardesty & Hanover 3850 N Causeway Blvd Ste 1850 Metairie LA 70002</p> <p>Babak Naghavi, 504-962-9212 bnaghavi@hardestyhanover.com</p>	<p>BFM Corporation provided extensive surveying services for a topographic survey and right-of-way (R/W) determination for the project. Project elements included setting GPS Static Control (5 permanent control points), traversing a proposed survey line, and land topography surveying. Additional phases include hydrographic topography/bathymetric surveying of the project area, the right-of-way determination, and subsurface utility engineering (SUE). Drone Surveying was utilized throughout the project. A Route Topographic Survey was also included as part of the scope, as was Subsurface Utility Engineering (SUE).</p>	
Completion Date (Actual or estimated):	Estimated Cost:	
	Entire Project:	Work for which Firm was Responsible:
2020 September	N/A	\$478,744 (fee)

TEC Professional Services Questionnaire

PROJECT NO. 3		
Project Name, Location, and Owner's Contact Information:	Nature of Firm's Responsibility:	
<p>Orange Lane Drainage Pump Station Project (Drainage Mapping), Grand Isle, Jefferson Parish, Louisiana</p> <p>AIMS Group, Inc. 4421 Zenith Street Metairie LA 70001</p> <p>Lowell Pitré, P.E., 504-887-7045 ljp@aimsgroupinc.com</p>	<p>The project consists of a new storm water pumping station on the intersection of Orange Lane at Orleans Avenue. The scope includes obtaining topographical survey information and the preparation of a drainage map for the project. Phase 1 of the project involved the topographic and right of way surveying services; BFM conducted a site topographic survey at the proposed lift station site and provided boundary surveying to determine rights of way. Phase 2 of the project established the Drainage Map. BFM located all drainage structures within the Limits of Survey; this included ditches, culverts, drain inlets, and catch basins. A drone survey was executed to gather a 25 ft elevation grid throughout the project area.</p>	
Completion Date (Actual or estimated):	Estimated Cost:	
	Entire Project:	Work for which Firm was Responsible:
2020 August	N/A	\$32,280 (fee)

PROJECT NO. 4		
Project Name, Location, and Owner's Contact Information:	Nature of Firm's Responsibility:	
<p>Mounes Street Subsurface Drainage (Phase IV, Dickory Avenue to Elmwood Park Boulevard), Jefferson Parish, Louisiana</p> <p>APTIM 2424 Edenborn Avenue Suite 450 Metairie LA 70001</p> <p>Gene S. Gillen, P.E., 504-832-4881 info@aptim.com</p>	<p>BFM provided topographic surveying services for Phase IV of the project, part of a multiphase program to improve drainage issues on Mounes Street. Phase IV of the project involved a topographic survey of the project, extending from Dickory Avenue to Elmwood Park Boulevard. Services provided by BFM included establishment of a baseline, setting temporary benchmarks (TBMs), elevation surveys, locating improvements and utilities as well as natural elements, and right-of-way surveying.</p>	
Completion Date (Actual or estimated):	Estimated Cost:	
	Entire Project:	Work for which Firm was Responsible:
2017 December	N/A	\$23,540 (fee)

TEC Professional Services Questionnaire

PROJECT NO. 5		
Project Name, Location, and Owner's Contact Information:	Nature of Firm's Responsibility:	
<p>West Bank Expressway, Phase I Drainage Map, from Peters Road to Manhattan Boulevard, Jefferson Parish, Louisiana</p> <p>Design Engineering 3330 W Esplanade Ave Ste 205 Metairie LA 70002</p> <p>John Holtgreve, P.E., 504-836-2155 jholtgreve@dei-engr.com</p>	<p>BFM provided topographic surveying services for the preparation of a drainage map for the project area. The Limits of Survey extended 300 feet in each direction on Peters Road, beginning at the westernmost right-of-way (R/W) Peters Road and terminating at the eastern edge of the Manhattan Boulevard intersection with the West Bank Expressway. The survey area further extended southerly and northerly down side streets (for 150 feet from the R/W) along the West Bank Expressway. BFM provided elevation shots on the gutter line and first lane divider on the east and westbound sections of the elevated structure. Sections on the elevated structure were taken at 25-foot intervals. A digital elevation model was also prepared.</p>	
Completion Date (Actual or estimated):	Estimated Cost:	
	Entire Project:	Work for which Firm was Responsible:
2004 September	N/A	\$155,790 (fee)

PROJECT NO. 6		
Project Name, Location, and Owner's Contact Information:	Nature of Firm's Responsibility:	
<p>Metairie Road Drainage Evaluation, Metairie, Jefferson Parish, Louisiana</p> <p>GEC, Inc. 3445 N Causeway Blvd Ste 401 Metairie LA 70002-3779</p> <p>Jerome Lohmann, 504-207-6926 jlohmann@gecinc.com</p>	<p>BFM provided surveying services for this Drainage Evaluation Project (PW 2018-024-DR). The scope of services included a full Route Topographic Survey (includes all services, utilities, properties, elevations and items necessary to perform any and all engineering and construction work) from gutter line to gutter line along Metairie Road from the westerly apparent right-of-way (R/W) of Causeway Boulevard to easterly apparent R/W of Focis Street. The project encompassed approximately 10,400 linear feet, with cross-sections and elevations surveyed included as part of the scope.</p>	
Completion Date (Actual or estimated):	Estimated Cost:	
	Entire Project:	Work for which Firm was Responsible:
2020 May	N/A	\$18,350 (fee)

TEC Professional Services Questionnaire

PROJECT NO. 7		
Project Name, Location, and Owner's Contact Information:	Nature of Firm's Responsibility:	
<p>Coventry Drainage Pump Stations, Jefferson Parish, Louisiana</p> <p>ECM Consultants, Inc. 1301 Clearview Pkwy Ste 200 Metairie LA 70001</p> <p>Sunina Shrestha, 504-885-4080 SShrestha@ecmconsultants.com</p>	<p>BFM provided a Route Topographic Survey with Hydrographic Survey for the project, located in River Ridge, Louisiana. The limits of survey extended from r/w to r/w along Jefferson Highway. The levee and hydrographic survey area was noted as 400 feet wide (200 ft. in either direction of the extended centerline of Colonial Heights Road). Drone Surveying was a key element of the project. The hydrographic survey extended 500 feet into the river from the water's edge.</p>	
Completion Date (Actual or estimated):	Estimated Cost:	
	Entire Project:	Work for which Firm was Responsible:
2020	N/A	\$89,780 (fee)

PROJECT NO. 8		
Project Name, Location, and Owner's Contact Information:	Nature of Firm's Responsibility:	
<p>Waggaman Canal Relocation Survey (Jefferson Parish Landfill Sites), Jefferson Parish, Louisiana</p> <p>CDMSmith 1515 Poydras St Ste 1000 New Orleans LA 70112</p> <p>Jenny Bywater, P.E., 504-799-1168 bywaterje@cdmsmith.com</p>	<p>BFM Corporation was contracted to provide boundary, right-of-way, and topographic surveying services for the project site. Location of improvements were plotted within the designated limits of the survey; this included buildings, fences, light standards, traffic control devices, signage, structures, pavement, and other topographic features. Existing storm sewer and sanitary sewers were located using top of casing; invert elevations were provided on the survey.</p>	
Completion Date (Actual or estimated):	Estimated Cost:	
	Entire Project:	Work for which Firm was Responsible:
2016 February	N/A	\$19,940 (fee)

TEC Professional Services Questionnaire

PROJECT NO. 9		
Project Name, Location, and Owner's Contact Information:	Nature of Firm's Responsibility:	
<p>Revere Road W-3 Drainage Survey, St. Tammany Parish, Louisiana</p> <p>St. Tammany Parish Post Office Box 628 Covington LA 70434</p> <p>Beverly Mathies, 985-898-2520 procurement@stpgov.org</p>	<p>BFM provided surveying services to the St. Tammany Parish Government (Survey Services Contract No. 16-104) for this Drainage Survey project on Revere Road. The scope of services included a boundary survey with notation of improvements. Extensive records research was a precursor to the execution of the field survey. BFM also provided cross sections of Bayou De Zaire and of the drainage feature with notation of natural ground features, improvements, encroachments, and easements/servitudes. Upon completion, BFM provided AutoCAD maps and parcel property descriptions to the Parish.</p>	
Completion Date (Actual or estimated):	Estimated Cost:	
	Entire Project:	Work for which Firm was Responsible:
2020 May	N/A	\$18,960 (fee)

PROJECT NO. 10		
Project Name, Location, and Owner's Contact Information:	Nature of Firm's Responsibility:	
<p>Brewster Road Subsurface Drainage Improvements and Proposed Detention Pond, St. Tammany Parish, Louisiana</p> <p>N-Y Associates, Inc. 2750 Lake Villa Drive Metairie LA 70002</p> <p>Fred Mortali, 419-346-6282 fmortali@n-yassociates.com</p>	<p>BFM provided multiple surveying services (including Route Topographic, Right-of-Way, Drainage Study, Property Acquisition) for the Brewster Road Subsurface Drainage Improvements and Proposed Detention Pond in St. Tammany Parish. The Limits of Survey included the area of Brewster Road between LA HWY 1077 and LA HWY 21; BFM provided Temporary Benchmarks, location of all improvements (natural and man-made) and utilities (including drainage, sewer, and water structures), and coordination with State and Local agencies. BFM took cross-sections at 100 ft. intervals and property corners along the route to determine rights-of-way.</p>	
Completion Date (Actual or estimated):	Estimated Cost:	
	Entire Project:	Work for which Firm was Responsible:
2020 September	N/A	\$203,320 (fee)

TEC Professional Services Questionnaire

M. List all prior and/or on-going litigation between Firm and Jefferson Parish. Please attach additional pages if necessary.

Parties:		Status/Result of Case:
Plaintiff:	Defendant:	
1.	<div style="border: 1px solid black; padding: 5px; margin: 5px auto; width: 80%;"> <p style="text-align: center;"><i>BFM Corporation is not currently, nor has it previously been involved, in litigation with Jefferson Parish.</i></p> </div>	
2.		
3.		
4.		

N. Use this space to provide any additional information or description of resources supporting Firm's qualifications for the proposed project.

BFM CORPORATION, LLC

Professional Land & Hydrographic Surveying

CRITERIA 1 • PROFESSIONAL TRAINING AND RELEVANT PROJECT EXPERIENCE

Established in 1982, **BFM Corporation, LLC, Professional Land & Hydrographic Surveying**, has provided services to public & private concerns throughout Louisiana and the Gulf South. The firm provides surveying services covering all facets of engineering, construction, and forensics; topographic, hydrographic, and high definition laser scanning.

BFM is a majority Woman-Owned Business Enterprise (WBE) as well as a Hudson Initiative certified Small & Emerging Business and Small Entrepreneurship in Louisiana.

Our capabilities include the following and more:

- **Topographic Surveying**
- **Drone Surveying / Photogrammic and LiDAR**
- **Bathymetric / Hydrographic Surveys**
- **Property, Boundary, and Right-of-Way Surveys**

TEC Professional Services Questionnaire

N. continued.

- **Maps, Cross-Sections, and Data Sets**
- **3D Laser Scanning**
- **Benchmarks**
- **Construction-Related Surveying**
- **Builder's Package Surveys**
- **American Land Title Association (ALTA) Surveys**

BFM's project work routinely involves **extensive records and related research** as an element of successful completion, as well as coordination with the client, agency or department. BFM has the personnel to make sure this is done correctly and expeditiously.

Our **Survey Field Crews** are equipped with Leica Viva and Leica Captivate Data Collectors, as well as Leica GPS Smart Antennas. Each GPS unit is linked to the Leica SmartNet Network, giving each crew the ability for Real Time Kinematic Positioning (RTK), derived from the Global Navigation Satellite System (GNSS). Furthermore, each crew is outfitted with Leica TS series robotic total stations, simplifying and expediting projects. BFM can also use in-house drones and 3D scanners to further analyze sites and projects. BFM's crews are trained to use this equipment to its full potential to maximize accuracy and efficiency in the field.

BFM offers **Drone Surveying Services**, featuring a DJI Matrice 600 Pro drone outfitted with a Sony A7R3 42-megapixel camera, Pixhawk Triggering System, VMAP PPK system, and an A3 Pro Flight Controller. It can capture 50 acres of land in that time (with a flight ceiling of 165 feet, pixel quality is 0.71 CM). This allows BFM to quickly & accurately capture data and facilitates quicker field work to produce highly accurate and precise surveying information. Deliverables feature Clean Point Cloud, 3D Mesh, Orthomosaic, and AutoCAD DWG Topographic.

BFM's **3D modeling capabilities** allow us to process & model for any design purpose. High-definition scanner data is processed using software from Leica and Autodesk. BFM is working on non-traditional survey deliverables, including virtual tours, live walkthroughs, detailed pipe rack modeling, and modeling for use with Autodesk Revit Architecture.

When needed, BFM Corporation provides **bathymetric surveying** to handle any **hydrographic surveying** tasks. For large rivers and bodies of water, BFM is equipped with Teledyne Odom Hydro Solutions' Hydro Trac Single Beam Echo Sounder. For smaller bodies of water, BFM uses an SL20 Remote Controlled Boat equipped with CEE Scope Dual Channel Echo Sounder. The firm uses Hypack Software to process collected data. Further, BFM can execute multi-beam scans, side scans and magnetometer surveys upon request.

Please refer to the projects presented in Item L of this form as well as our personnel bios for an overview of relevant project work executed by BFM Corporation.

TEC Professional Services Questionnaire

N. continued.

CRITERIA 2 • CAPACITY FOR TIMELY COMPLETION OF NEWLY-ASSIGNED WORK

BFM Corporation has the manpower and equipment to execute any surveying task within the reasonable time set forth by the contract or project engineer. It is our continual goal to keep this reputation solid. We establish base costs and fees for our services, and work with our clients to meet all project budgets. Our workload and scheduling, and proximity to the project site, will allow for quick assignment of personnel to any directed project.

BFM Corporation's **Ralph P. Fontcuberta, Jr., PLS**, is a **Louisiana-Registered Professional Land Surveyor (since 1974)** and meets or exceeds any minimum requirements for any surveying project. He has been **providing surveying services in Louisiana for over 50 years** and brings an almost incalculable wealth of experience in the region to any project, especially in Southeast Louisiana.

BFM's **Chad M. Poché, P.E.** brings **more than 25 years of experience** to assist in completing projects on time and within budget. He has been a consulting geotechnical engineer for more than 20 years in South Louisiana and has been the geotechnical engineer of record for thousands of projects throughout his career.

Our personnel included **multiple survey crews** and a **fully-staffed drafting department** to handle any project needs; they are thoroughly trained and extensively familiar with the region and needs of various types of surveying projects.

CRITERIA 3 • LOCATION OF PRINCIPAL OFFICE

BFM has called **Jefferson Parish home office location since the firm's inception in 1982**; our principal office is located in Jefferson Parish at **15 Veterans Memorial Boulevard** in Kenner.

CRITERIA 4 • ADVERSARIAL LEGAL PROCEEDINGS WITH PARISH

BFM Corporation is **not involved in litigation with Jefferson Parish** nor with any of our clients, as is noted in *Item M* of this form.

CRITERIA 5 • PRIOR SUCCESSFUL COMPLETION OF PROJECTS

For nearly 40 years, BFM Corporation has completed thousands of projects throughout Jefferson Parish and Southeast Louisiana, both to municipal and various private clients, similar to the project at hand, not to mention other drainage projects in a wide range of sizes, from small lot to Parish-wide endeavors. **Multiple examples of this work are included throughout this form in both the *Personnel Résumés* section (Item K) and *Representative Project Work* (Item L).** Further, BFM has worked with virtually every municipality in the region. We enjoy a high repeat-business rate with all our clients. We offer the following specific references for contact:

- **Mark R. Drewes, P.E.**, Director, Jefferson Parish Public Works Department (504-736-6783 | JPPW@jeffparish.net)
- **Neil Schneider, CCM, P.E.**, Director, Capital Projects, Jefferson Parish Public Works Department (504-736-6783 | JPPW@jeffparish.net)

TEC Professional Services Questionnaire

N. continued.

- **Angela DeSoto, P.E.**, Director of Engineering, Jefferson Parish (504-736-6511 | ADeSoto@jeffparish.net)
- **Sid Trouard, P.E.**, Program Manager, Jefferson Parish Sewerage Capital Improvement Program (504-736-6386 | STrouard@jeffparish.net)
- **Tom Schreiner**, Deputy CAO, Public Works & Capital Projects, City of Kenner (504-468-7515 | tschreiner@kenner.la.us)
- **Greg Cromer**, Mayor, City of Slidell (985-646-4333 | gcromer@cityofslidell.org)

Our professional work history is exemplary. We strive to provide on-time and technically thorough project deliverables at the budget set by our clients.

CRITERIA 6 • SIZE OF FIRM

As noted, BFM has the manpower and equipment to execute any surveying task within the reasonable time set forth by the contract or project engineer. BFM has no issue with meeting the project deadlines set forth by our clients, both municipal and private. It is our continual goal to keep this reputation solid. Further, we establish base costs and fees for our services, and work with our clients to meet all project budgets.

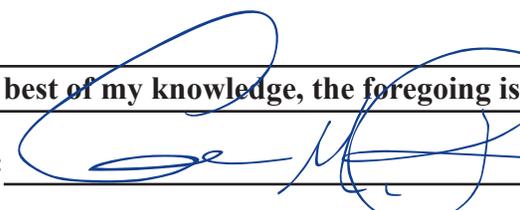
As noted in **item E of this form**, BFM currently has a **full time staff of two dozen people**, including **two Registered Professional Land Surveyors, Survey Field Crew Personnel, and AutoCAD drafting personnel**, as well as **complete administrative and support staff**.

CRITERIA 7 • PAST PERFORMANCE ON PARISH CONTRACTS

BFM has provided surveying services in **Jefferson Parish since 1982**, both **directly to Parish agencies and as a consultant to firms serving the Parish**. The firm has executed many hundreds of projects in the Parish, including both direct Parish projects and agency projects (CPRA, Louisiana DOTD, etc.), not to mention the scores of surveying projects for private individuals and industry.

As noted, Mr. Fontcuberta has **over half a century of professional land surveying experience**, including nearly 40 years with BFM. He has provided professional surveying services for **thousands of projects for and throughout Jefferson Parish**. Additional information beyond the scope of this RFQ response is available upon request.

O. To the best of my knowledge, the foregoing is an accurate statement of facts.

Signature:  Print Name: Chad M. Poché, P.E.
Title: Executive Vice President Date: March 10, 2022

The Louisiana Professional Engineering and Land Surveying Board has the following information on file:

Name:	Public Address:
BFM Corporation, LLC	15 Veterans Memorial Boulevard Kenner, Louisiana 70062

License/Certificate Information w/ Supervision

License	Status	First Issuance Date	Expiration Date	Supervisor(s)
VF.0000008	Active	09/11/1984	09/30/2023	Mr. Ralph P. Fontcuberta Jr. # PLS.0004329 - Active



**LOUISIANA PROFESSIONAL
ENGINEERING & LAND SURVEYING BOARD
(LAPELS)**
9643 Brookline Avenue, Suite 121
Baton Rouge, LA 70809
Phone (225) 925-6291
www.lapels.com

Mr. Ralph P. Fontcuberta Jr.

License/Certificate Type - Number	Expiration Date
PLS.0004329	09/30/2022
Status: Active	



**LOUISIANA PROFESSIONAL
ENGINEERING & LAND SURVEYING BOARD
(LAPELS)**
9643 Brookline Avenue, Suite 121
Baton Rouge, LA 70809
Phone (225) 925-6291
www.lapels.com

Mr. Chad Mitchell Poche

License/Certificate Type - Number	Expiration Date
PE.0027667	09/30/2022
Status: Active	



**LOUISIANA PROFESSIONAL
ENGINEERING & LAND SURVEYING BOARD
(LAPELS)**
9643 Brookline Avenue, Suite 121
Baton Rouge, LA 70809
Phone (225) 925-6291
www.lapels.com

Mr. Gary James Lambert Jr.

License/Certificate Type - Number	Expiration Date
PLS.0005259	03/31/2023
Status: Active	



Division of Small and Emerging Business Development
SEBD CERTIFICATION

BFM CORPORATION, LLC

is hereby certified as a Small and Emerging Business Enterprise.

This certification is valid beginning 7/19/2019 and supersedes any registration or listing previously issued. At any time there is a change in ownership or control of the firm, notification must be made immediately to the Division of Small and Emerging Business Development.

Issued at Baton Rouge, Louisiana 7/19/2019

This certification expires on: 7/19/2029

Certification No. 9551

John W. Matthews, Jr.,
Executive Director, Entrepreneurial Services



DIVISION OF SMALL BUSINESS SERVICES

This certification acknowledges that

BFM CORPORATION, LLC

is Certified-Active as a Small Entrepreneurship with Louisiana Economic Development's Hudson Initiative.

This certification is valid from 9/28/2021 to 9/28/2022 .

Certification No. 9551

Stephanie Hartman,
Director, Small Business Services

T. BAKER SMITH, LLC TEC QUESTIONNAIRE

TEC Professional Services Questionnaire

A. Project Name and Advertisement Resolution Number:

**PROFESSIONAL ENGINEERING AND SUPPLEMENTAL SERVICES FOR A DRAINAGE
MASTER PLAN FOR THE WEST BANK OF JEFFERSON PARISH.**

Resolution 137573

B. Firm Name & Address where Project work will be performed:

T. Baker Smith, LLC
740 Phosphor Avenue, Suite B
Metairie, LA 70005



C. Name, title and contact information of Principal, as defined in Section 2-926 of the Jefferson Parish Code of Ordinances, who is a registered, licensed architect, professional engineer, or surveyor in the State of Louisiana:

Kenneth Wm. Smith, PE, PLS, FACEC
Chief Executive Officer
985.223.9248
Kenneth.Smith@tbsmith.com

D. Name and contact information of employee who is a registered and licensed architect, professional engineer, or surveyor in the State of Louisiana in the applicable discipline. A subcontractor may be substituted here only if the advertised Project requires more than one discipline.

David Martinez, PLS
Survey Discipline Leader
985.223.9250
David.Martinez@tbsmith.com

E. Please provide the number of employees whose primary function corresponds with each category:

<u>34</u> Administrative	<u> </u> Estimators	<u> </u> Specification Writers
<u> </u> Architects (Licensed)	<u> </u> Geologists	<u> 1</u> Structural Engineers
<u> </u> Chemical Engineers	<u> </u> Geotechnical Engineers	<u> </u> Graduate Engineers
<u>23</u> Civil Engineers	<u> </u> Interior Designers	<u>21</u> Project Managers
<u> 5</u> Construction Inspectors	<u> 1</u> Landscape Architects	<u> </u> Clerical
<u> </u> Ecologists	<u>49</u> Land Surveyor	<u> </u> Grant/Funding Specialist
<u> </u> Electrical Engineers	<u> 1</u> Mechanical Engineers	<u> </u> Sanitary Engineers
<u>11</u> Engineer Intern	<u> 1</u> Environmental Engineers	<u>18</u> Technicians/Analysts
<u>21</u> Professional Land Surveyors		<u>230</u> TOTAL

F. Is this submittal by a JOINT-VENTURE? Please check: YES NO X

If marked “No” skip to Section I. If marked “yes” complete Sections G-H.

TEC Professional Services Questionnaire

G. If submittal is by JOINT-VENTURE, list the firms participating and outline specific areas of responsibility (including administrative, technical, and financial) for each firm. Please attach additional pages if necessary.

N/A

H. Has this JOINT-VENTURE previously worked together? Please check:

YES _____ NO _____ N/A

I. List all subcontractors anticipated for this Project. Please note that all subcontractors must submit a fully completed copy of this questionnaire, applicable licenses, and any other information required by the advertisement. See Jefferson Parish Code of Ordinances, Sec. 2-928(a)(3). Please attach additional pages if necessary.

Name & Address:	Specialty:	Worked with Firm Before (Yes or No):
N/A		

J. Please specify the total number of support personnel that may assist in the completion of this Project:

230 (all personnel, primary and support, will be available to work on all assigned projects)

TEC Professional Services Questionnaire

KEY PERSON, SPECIALIST, OR INDIVIDUAL CONSULTANT:

Name & Title:

David Martinez, PLS
Survey Discipline Leader

Project Assignment:

QA/QC Manager

Name of Firm with which associated:



Years' experience with this Firm:

37 years with this firm; 5 years with other firms

Education: Degree(s)/Year/Specialization:

Bachelor of Science/1982/Mechanical Engineering Technology

Active registration: Year first registered/discipline:

LA PLS.4614/1989/Survey

Other experience and qualifications relevant to the proposed Project:

As discipline leader of survey, David Martinez offers more than 42 years of overall experience and is responsible for the daily activities of survey parties engaged in all aspects of surveying services provided by TBS. He has direct responsibility for the product generated in the field, and he is also in direct control of the transfer of field information by the survey technicians in preparation of the final documents. The Survey group works in conjunction with all other groups at TBS, cataloging existing topography with data collectors and assisting in its transfer to engineering designs and documents and environmental documentation. He is routinely responsible for oversight and QA/QC of surveying projects for TBS.

Project Experience

I-10 Twin Span Demolition Survey, New Orleans, LA (NASDI, LLC) – Survey Discipline Leader/QAQC. Oversaw underwater acoustic hydrographic surveys including multi beam and side scan sonar for the purpose of identifying and locating debris and pipelines or other infrastructure on the bottom of the lake, underwater span location, and deposition of spans for use as an artificial reef during the demolition of the I-10 Twin Spans over Lake Pontchartrain.

Bucktown Harbor Entrance Hydrographic Survey, Jefferson Parish, LA (Jefferson Parish Government) - Survey Discipline Leader. Oversaw the collection of survey data.

Lafourche Parish Master Drainage Plan, Lafourche Parish, LA (Lafourche Parish Government) – Survey QA/QC. Oversaw the collection of topographic data, survey of approximately 181 miles of collection canal; with 366 cross sections, 412 bridges or culverts and 53 pump stations surveyed.

Forced Drainage Project 1-1B Channel Improvements, Terrebonne Parish, LA (Terrebonne Parish Consolidated Government) – Survey QA/QC. Conceptualization of the 1-1B project started in the mid-1980s; the system provides drainage for over 14 square miles, spanning from Houma northward to Thibodaux. The 18,000-acre 1-1B project contains over 10,000 acres of wetlands that were designed to be used as storage for excess run-off. The wetland areas within the system serve as reservoirs to store stormwater run-off until it is pumped out.

S.P. H.004113, I-12 to Bush: LA 3241 (LA 435 to LA 40/41), St. Tammany Parish, LA (LADOTD) – Senior Supervising Surveyor. Supervised topographic surveying for new 5.5 mile 4-lane SA-3 roadway from LA 435 to Bush, LA.

TEC Professional Services Questionnaire

KEY PERSON, SPECIALIST, OR INDIVIDUAL CONSULTANT:

Name & Title:

Rene Hebert, PLS
Survey Lead Professional

Project Assignment:

Survey Lead Professional

Name of Firm with which associated:



Years' experience with this Firm:

14 years with this firm; 2 years with other firms

Education: Degree(s)/Year/Specialization:

Bachelor of Science/2008/Geomatics

Active registration: Year first registered/discipline:

LA PLS.5070/2011/Survey

Other experience and qualifications relevant to the proposed Project:

As Survey Lead Professional, Rene has 16 years of project experience. He has served as Survey Lead Professional of numerous survey projects where he has been responsible for overseeing and executing the technical aspect of surveying projects including producing and revising drawings, sketches, plans, etc. for contract documents and QC/QA of surveying services. He coordinates work among project technicians, field crew coordinator, field survey personnel, and other required professionals working on the project. Rene has gained valuable experience surveying the environment of south Louisiana including topographic, boundary and GPR surveys and underwater acoustic hydrographic surveys including multi-beam, single beam, side scan sonar, acoustical soundings, magnetometry and other bathymetric surveys for industrial, government and private clients.

Project Experience

St. Bernard Port, Harbor and Terminal District Chalmette Slip Surveys, St. Bernard Parish, LA (St. Bernard Port, Harbor and Terminal District) – Hydrographic Survey Project Manager. Performed underwater acoustic hydrographic surveys including multi-beam, sidescan, magnetometry, and sub-bottom surveys in the Mississippi River in order to obtain detailed bottom conditions near the Chalmette Slip docking facility to recover damage heel-post turning dolphins and conduct other inspections.

Survey Retainer Contract No. 4400003473, Statewide LA (LADOTD) – Principal Surveyor. Oversaw surveying services including Topographic Survey, Title Research Reports, Property Survey, Title Updates, Right-of-Way (R/W) Maps for various project locations.

Harrison Improvements US190-LA59, St. Tammany Parish, LA (St. Tammany Parish Government) – Survey Lead Professional. Responsible for overseeing topographic surveys, crew coordination, oversight of data processing, surface generation for use in existing drainage maps, deliverable preparation, title take off, property surveys, prepared base and final right of way maps for the improvements along Harrison Ave. include approximately 13,200 feet of roadway widening along existing alignment including the installation of single lane roundabouts at Marigold Drive and Falconer Drive.

Nashville Wharf Terminal Survey Services, Orleans Parish, LA (AECOM, Ports America, Port NOLA) – Lead Professional. Oversaw all the topographic and hydrographic survey services at the Ports America facility at Port NOLA. Detailed topographic survey was performed, including under the wharf to collect the mudline topography from the face of the wharf to the bulkhead. Hydrographic side-scan and multibeam survey was performed from immediately in front of the wharf to hundreds of feet into the Mississippi River to record the contour of the river bottom for use in design of the proposed improvements to the facility.

S.P. No. H.001439, Bridges near Grand Isle, LA 1, Lafourche and Jefferson Parishes, LA (LADOTD) – Supervising Surveyor. Supervised property surveys and right of way surveys for the removal of three bridge structures located along LA 1 in Jefferson and Lafourche Parishes near the town of Grand Isle.

TEC Professional Services Questionnaire

KEY PERSON, SPECIALIST, OR INDIVIDUAL CONSULTANT:

Name & Title:

Eric Deroche

Director of Field & Office Technology

Project Assignment:

UAS Surveyor

Name of Firm with which associated:



Years' experience with this Firm:

19

Education: Degree(s)/Year/Specialization:

Associate of Applied Science/2001/Drafting and Design Technology

Active registration: Year first registered/discipline:

N/A

Other experience and qualifications relevant to the proposed Project:

Eric oversees the Unmanned Aerial Solutions (UAS) at TBS. He has seven years of experience providing professional unmanned aerial system solutions to our clients. Eric Deroche provides a professional vital link between all corporate wide project teams and the IT department. He is responsible for developing and maintaining an efficient and effective "Field to Finish" process corporate wide to serve our client's needs.

Project Experience

Causeway Water Tower UAS Survey, Jefferson Parish, LA (Jefferson Parish Government) – UAS Project Manager. Provided UAS services and data processing for the Causeway Water Tower Survey.

Hydrographic and LiDAR Surveys-17th Street Canal Pilot Project, Jefferson Parish, LA (Flood Protection Authority-East) – UAS Project Manager. Provided topographic and bathymetric canal surveying services: A pilot project assessment of production quality in very shallow water.

Eastbound West Esplanade (Transcontinental to Causeway) Survey, Jefferson Parish, LA (Jefferson Parish Government) – UAS Group Lead. Provided crew coordination for surveying services.

Confidential Client LIDAR Survey, LA – UAS Group Lead. Manage LIDAR surveys for client on an as-needed basis. The data provided by the surveys is utilized by the client for various uses including: existing impoundment expansion, verifying volume quantities provided by construction contractors, and in the annual reporting of airspace quantity to regulatory agencies.

Entergy Substation, Little Gypsy Plant Group – UAS Group Lead. Performed LiDAR survey to confirm as-built finished grade conditions of the SCPS Little Gypsy site.

Shell Refining, Deer Park, TX – UAS Group Lead. Managed LiDAR Topographic Survey and QL B SUE Survey.

Island Road Marsh Creation (TE-117), Topographic, Bathymetric, and Magnetometer Surveys, CPRA, Terrebonne Parish, LA – UAS Project Manager. Managed project that included drone flight operations to capture aerial ortho images with high spatial resolution in order to quickly and accurately map the islands. TBS was tasked with mapping the existing marsh island inside a proposed marsh creation cell for CPRA.

TEC Professional Services Questionnaire

KEY PERSON, SPECIALIST, OR INDIVIDUAL CONSULTANT:

Name & Title:

Matthew Stevens
Senior Project Technician/Field Surveyor

Project Assignment:

Hydrographic Field Surveyor

Name of Firm with which associated:



Years' experience with this Firm:

15

Education: Degree(s)/Year/Specialization:

Associate of Science/2005/Drafting and Design Technology

Active registration: Year first registered/discipline:

N/A

Other experience and qualifications relevant to the proposed Project:

Matt has been with TBS for 15 years and acts as a hydrographic surveyor on both inshore and offshore vessels. He is an American Design Drafting Association certified drafter who is proficient in the use of AutoCAD, Inventor and data processing for all instruments used by TBS in hydrographic surveying. Matt has spearheaded the processing and drafting portion of many large and high-profile projects at TBS.

Project Experience

Bucktown Harbor Entrance Hydrographic Survey, Jefferson Parish, LA (Jefferson Parish Government) – Hydrographic Surveyor. Performed hydrographic surveys for the Bucktown Harbor area.

Metairie Marsh Hydrographic Survey, Jefferson Parish, LA (Jefferson Parish Government) – Hydrographic Surveyor. Performed a hydrographic survey of the Lake Pontchartrain shoreline and surrounding areas.

St. Bernard Port, Harbor and Terminal District Chalmette Slip Surveys, St. Bernard Parish, LA (St. Bernard Port, Harbor and Terminal District) – Hydrographic Surveyor. Performed underwater acoustic hydrographic surveys including multi-beam, side-scan, magnetometry, and sub-bottom surveys in the Mississippi River in order to obtain detailed bottom conditions near the Chalmette Slip docking facility to recover damage heel-post turning dolphins and conduct other inspections.

I-10 Twin Span Demolition Survey, Orleans Parish, LA (NASDI, LLC) – Hydrographic Surveyor. Hydrographic surveys for identifying and locating debris, pipelines, or other infrastructure on the bottom of the lake for the demolition of the I-10 Twin Spans.

Ports America Milan Concrete Paving Improvements/Nashville Terminal Conversion to Container and Crane Rail Extension, Orleans Parish, LA– Hydrographic Surveyor. Performed professional hydrographic surveying services in the river.

Nashville Wharf Terminal Survey Services, Orleans Parish, LA (AECOM, Ports America, Port NOLA) – Hydrographic Surveyor. Hydrographic side-scan and multibeam survey was performed from immediately in front of the wharf to hundreds of feet into the Mississippi River to record the contour of the river bottom for use in design of the proposed improvements to the facility. Also, Detailed topographic survey was performed over the site, including under the wharf to collect the mudline topography from the face of the wharf to the bulkhead.

TEC Professional Services Questionnaire

KEY PERSON, SPECIALIST, OR INDIVIDUAL CONSULTANT:

Name & Title:

Andrew Szush, PLS
Project Surveyor

Project Assignment:

UAS Surveyor

Name of Firm with which associated:



Years' experience with this Firm:

7 years with this firm; 3 years with other firms

Education: Degree(s)/Year/Specialization:

Bachelor of Science/2012/Geomatics

Active registration: Year first registered/discipline:

LA PLS.5136/2012/Survey

Other experience and qualifications relevant to the proposed Project:

Andrew Szush is a Louisiana-licensed Professional Land Surveyor that creates, reviews, and certifies survey documents and legal records in accordance with state statutes. He is primarily responsible for leading the technical aspect of survey efforts on projects. This includes providing technical support to the overall project manager by calculating, analyzing, organizing, coordinating, and researching information, preparing drawings, and generally providing the necessary support to complete the survey effort. Andrew also prepares field survey packs through analyzing pertinent survey information used to direct the field survey crew on methods and procedures for establishing and reestablishing survey control.

Andrew has managed in excess of 1,000 total manhours for the Unmanned Aerial Systems (UAS) projects he has been involved with since TBS began offering this service six years ago. As Project Surveyor, he has managed every aspect of these projects including gathering the data in the field, processing and digital modeling of the data collected, and producing the final documents for delivery to the client.

Project Experience

W. Esplanade (Transcontinental to Causeway) Survey, Jefferson Parish Government, Jefferson Parish, LA – Project Surveyor. Acquired aerial site photos.

Ergon-St. James, Inc., St. James, LA, Survey Services – Project Surveyor. Performed UAS Topographic Survey. Acquired additional topographic survey data to accompany aerial photogrammetric survey of features not visible in aerial images. Topographic features collected by GPS RTK were combined with aerial survey data to produce a complete topographic plat of the proposed site.

Confidential Client, LA Gyp Stack Aerial Survey – Project Surveyor. Lead survey efforts to reestablish the control network of existing monuments through conventional survey methods. Set new monuments as well as establish locations of permanent aerial targets in future expansion areas. Survey was performed in both Plant and Louisiana State Plane Coordinate systems.

Bayou Dularge Marsh, Ridge, & Hydrologic Restoration, Terrebonne Parish, LA – Surveyor of Record for UAS Services. Directly involved in conducting field and LIDAR surveys as well as processing data. The project will create 660 acres of marsh, 4+ miles of ridge and a partial closure of Grand Pass. TBS is responsible for hydrodynamic monitoring; topographic, bathymetric, magnetometer, and UAS surveys; oyster surveys; and coastal engineering support for the project.

TEC Professional Services Questionnaire

KEY PERSON, SPECIALIST, OR INDIVIDUAL CONSULTANT:

Name & Title:

Ryan LeBoeuf, LSI
Sr. Project Technician

Project Assignment:

Chief Pilot/Sr. UAS Data Analyst

Name of Firm with which associated:



Years' experience with this Firm:

14

Education: Degree(s)/Year/Specialization:

Bachelor of Science/2015/Geomatics

Active registration: Year first registered/discipline:

669/LA/ 3/31/2021 - Survey Intern
FAA Licensed Remote Pilot, 4102978; FAA Licensed Private Pilot, 850941

Other experience and qualifications relevant to the proposed Project:

Ryan LeBoeuf is an FAA Licensed Pilot and serves as Chief Pilot of Unmanned Aerial Solutions (UAS) at TBS. He has five years of experience as a pilot and has overseen all unmanned flight planning and operations for the last five years. He has created digital terrain models and managed preparation of project deliverables. He also has more than twelve years of experience preparing regulatory permit drawings, pipeline construction/maintenance drawings, managing GIS databases, utilizing GIS for project planning assistance, preparing right-of-way and boundary plats, and providing general assistance to managers to complete environmental, survey, and engineering projects. He also has experience working with aerial photography, LiDAR, digital elevation models, topographic survey data, contours, hydrologic and soils data, photo interpretation/classification, and global positioning systems.

Project Experience

Racoon Island Breakwater Survey TE-48, Terrebonne Parish, LA – UAS Data Analyst. TBS was hired to perform a post-restoration survey on the restored part of the island and the breakers. The Unmanned Aerial Systems department acquired high resolution aerial imagery, as well as a high density/high accuracy point cloud to generate a surface model of the island. This aerial survey was completed in order to assist the conventional surveyors on the ground and to gather an abundance of data on the entire island to be used for erosion monitoring on an annual basis.

Bayou Dularge Marsh, Ridge, & Hydrologic Restoration, Terrebonne Parish, LA – Chief Pilot/UAS Data Analyst. The primary goal of this project is to provide shoreline protection by using the living shoreline products to attenuate the wave energy that reaches the shore. TBS will provide survey data collection tasks and monitoring of nearshore waves at set locations near the different breakwater configurations. Mr. LeBoeuf is directly involved in conducting and processing LIDAR surveys.

Topographic, Bathymetric, and Magnetometer Surveys, Contract No. 2503-15-33, Survey Services for Coastal Restoration Projects (TE-117), CPRA – Chief Pilot/UAS Data Analyst. TBS was tasked with mapping the existing marsh island inside a proposed marsh creation cell for CPRA. The UAS department conducted the necessary drone flight operations to capture aerial ortho images with high spatial resolution in order to quickly and accurately map the islands.

TEC Professional Services Questionnaire

KEY PERSON, SPECIALIST, OR INDIVIDUAL CONSULTANT:

Name & Title:

Brian Moldaner, PE, MBA
Engineering Lead Professional

Project Assignment:

Client Liaison

Name of Firm with which associated:



Years' experience with this Firm:

10

Education: Degree(s)/Year/Specialization:

Master of Business Administration/2019
Bachelor of Science/2011/Civil Engineering

Active registration: Year first registered/discipline:

LA PE.40075/2015/Civil

Other experience and qualifications relevant to the proposed Project:

Brian Moldaner is a licensed professional engineer and project manager who is skilled at coordinating projects involving various disciplines including engineering, surveying and environmental services. He performs various project management duties that include developing service fee proposals, creating project management plans, coordinating subconsultants, and coordinating survey and environmental field crews. As a professional engineer, he designs complete plan sets for civil projects, including site developments, roadways, drainage systems, bridges, pipelines, and utilities. During his undergraduate studies and prior to his employment with T. Baker Smith, Brian worked as a construction aide at his father's residential construction company in Jefferson Parish, LA, where the principles of a solid work ethic and pride in his work were established.

Project Experience

Bucktown Boardwalk Survey Services, Jefferson Parish, LA (Jefferson Parish Government) – Overall Project Manager. Supervised all professional services including topographic, hydrographic and aerial-based surveys.

West Esplanade Avenue Restoration Eastbound (Tartan Drive To Haring Road), Project No. 2017-032-RBP, Jefferson Parish, LA (Jefferson Parish Government) – Project Manager; Engineer of Record. Responsible for the design of approximately 2,650 LF of two-lane concrete roadway reconstruction. Designed roadway alignment to maximize roadway comfort, cross-drain upgrades, sidewalk reconstruction, sidewalk drainage improvements and resurfacing of connected asphalt turn lanes. Coordinated additional design by Jefferson Parish Engineering Department including waterline relocations and light pole relocations. Coordinated and oversaw topographic survey services also provided by TBS, as well as geotechnical engineering and construction project representative services provided by subconsultants.

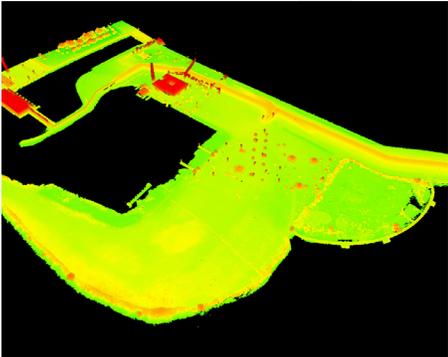
David Drive Corridor Improvements (West Napoleon Avenue to Veterans Boulevard), Project No. 2017-015-RBP, Jefferson Parish, LA (Jefferson Parish Government, Drainage Subconsultant) – Project Manager. Performed engineering and project management services for all aspects of design of the drainage improvements associated with the reconstruction of the roadway corridor, including drainage system modeling to size culverts, placement of drainage structures, constructibility review, utility conflict identification and general plan set preparation.

Labarre Road Widening (Airline Drive to Loumor Street), Project No. 2017-020-RBP, Jefferson Parish, LA (Jefferson Parish Government) – Overall Project Manager; Engineer of Record. Supervised all professional services including the topographic survey and performed schematic design for Labarre Road Widening.

Monroe Street Drainage Improvements Mandeville, LA – Overall Project Manager, Project Engineer. Provided engineering services for the upgrade of existing pipe diameters, enclosure of existing open ditches, upgrade of new cross culverts, and miscellaneous subsurface drainage piping in the segments of Kleber Street and Monroe Street that experienced street flooding in Mandeville, LA. Provided analysis of the upstream drainage areas to size drainage system in project area appropriately. Managed all supporting consulting services including topographic surveying and geotechnical investigations. Assisted the City with bidding of the project, provided construction administration services throughout construction and provided as-built record drawings at completion.

TEC Professional Services Questionnaire

L. Work by Firm or Joint-Venture members which best illustrates current qualifications relevant to this Project. Please include any and all work performed for Jefferson Parish. Please attach additional pages if necessary.

PROJECT NO. 1		
Project Name, Location and Owner's contact information:	Nature of Firm's Responsibility:	
<p>Bucktown Harbor Survey Services Jefferson Parish, LA</p> <p><i>Jefferson Parish Government Mark Drewes 1221 Elmwood Pk. Blvd. Suite 802 Jefferson, LA 70123 504.736.6500</i></p> <div style="display: flex; flex-direction: column; align-items: center;">   <p><i>Bucktown Boardwalk LiDAR images</i></p> </div>	<p>Bucktown Harbor is a partially reclaimed stretch of 30+ acres of lake bottom which forms a protected harbor on the south shore of Lake Pontchartrain in Metairie, LA. Currently a home base for the U.S. Coast Guard Station New Orleans and serving as a recreational and commercial fishing marina, the Harbor is largely undeveloped. This property provides opportunity to develop a vibrant waterfront gathering place, rich with tradition and honoring the history of the community. Future plans for the property include modification of the harbor entry, additional boating docks, terraced lawns, an educational marsh boardwalk and fishing pier, among other features.</p> <p>TBS conducted a topographic survey of existing interior marsh area and lake edge. This work was performed strictly on foot as not to disturb the vegetation in the interior marsh or the lake edge. TBS collected elevation data on a 50-foot grid through the marsh area. In the area of the proposed interior decks, TBS collected elevation data on a 25-foot grid. TBS also provided a detailed survey of an existing water feature that connects the interior marsh with the lake, and cross-section of the existing rip-rap that runs along the lake shoreline. In specified locations TBS extended these cross sections into the lake to locate the end of the submerged rip-rock.</p> <p>Services Provided:</p> <ul style="list-style-type: none"> • Site-wide topographic land surveying <ul style="list-style-type: none"> ○ 36-acre Topographic Survey ○ Utilities Mapping ○ Elevation Grid of Marsh Area • Single-Beam Hydrographic Survey <ul style="list-style-type: none"> ○ Inner Harbor ○ Pump Station Discharge Area ○ Lake Pontchartrain Shoreline from Harbor to Causeway Bridge • Multi-Beam Hydrographic Survey <ul style="list-style-type: none"> ○ Harbor Entrance ○ Pump Station Discharge Area • 6(f) Boundary in Accordance with LWCF Guidelines • Shoreline Erosion Assessment (Ongoing) <ul style="list-style-type: none"> ○ Aerial LiDAR ○ Traditional Topographic Survey ○ Bathymetric Survey 	
Completion Date (Actual or estimated):	Estimated Cost:	
2021 (actual)	Entire Project:	Work for which Firm was Responsible:
	N/A	\$48,650

TEC Professional Services Questionnaire

L. Work by Firm or Joint-Venture members which best illustrates current qualifications relevant to this Project. Please include any and all work performed for Jefferson Parish. Please attach additional pages if necessary.

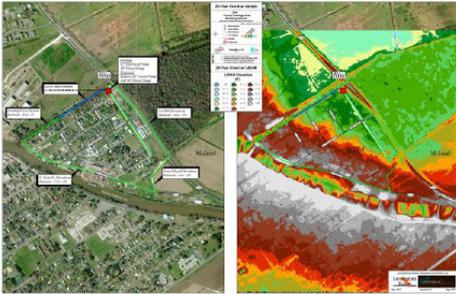
PROJECT NO. 2

Project Name, Location and Owner's contact information:	Nature of Firm's Responsibility:	
<p>17th Street Canal Pilot Project - Hydrographic and LiDAR Surveys Jefferson Parish, LA</p> <p><i>Flood Protection Authority-East</i> <i>Sean Hodges</i> <i>6920 Franklin Ave</i> <i>Suite 107</i> <i>New Orleans, LA 70122</i> <i>504.286.3115</i></p>  <p align="center"><i>17th Street Canal</i></p>  <p align="center"><i>Seafloor Systems Echo-boat Autonomous Survey Vehicle</i></p>	<p>Flood Protection Authority – East (FPA-E) retained TBS to provide a bathymetric and aerial lidar survey on the 17th Street Canal “Site 1” test site in Jefferson Parish, LA. This survey provided FPA-E with the data necessary to evaluate the use of hydrographic survey methods in shallow water applications. TBS conducted a hydrographic and aerial lidar survey on June 19, 2020 to facilitate these efforts.</p> <p>For the hydrographic survey, Trimble R10 base stations, Trimble R10 rover units, and Trimble TSC-7 data collectors were used to establish control and collect all data for the project. The hydrographic survey was completed using hydrographic methods utilizing a three-man survey crew with the Seafloor Systems Echo-boat Autonomous Survey Vehicle (ASV). The water bottom elevations were recorded using a PicoMB140 multi-beam echo-sounder.</p> <p>For the Aerial LiDAR portion of the project, the equipment used for control and all data collected on this project were Trimble R10 base stations, Trimble R10 rover units, and Trimble TSC-7 data collectors. A TBS survey crew consisting of a licensed pilot and a payload operator/visual observer collected the LiDAR (Light Detection and Ranging) and aerial imagery data. Components of the aerial system used in the field consist of DJI Matrice 600 Pro UAV, Phoenix Aerial Systems onboard computer, NovAtel Micro IMU, Velodyne HDL-32 LiDAR Sensor, Sony Alpha A6000 digital camera, GPS/GNSS RTK antenna, and a field computer.</p> <p>During the data collection period, the payload operator remained in constant contact with the aircraft via cellular connection. A real-time view of the data being collected was streamed back to the payload operator's field computer to ensure the area of interest was within the data swath. All data was stored on the onboard computer and transferred to an office workstation upon mission completion.</p> <p>Upon completion of the aerial and bathymetric surveys, TBS compiled the data into a single survey deliverable and submitted report to FPA-E addressing the successes and challenges of the pilot project.</p>	
Completion Date (Actual or estimated):	Estimated Cost:	
2020 (actual)	Entire Project:	Work for which Firm was Responsible:
	N/A	\$22,000

TEC Professional Services Questionnaire

L. Work by Firm or Joint-Venture members which best illustrates current qualifications relevant to this Project. Please include any and all work performed for Jefferson Parish. Please attach additional pages if necessary.

PROJECT NO. 3

Project Name, Location and Owner's contact information:	Nature of Firm's Responsibility:	
<p>Lafourche Parish Master Drainage Plan Lafourche Parish, LA</p> <p><i>Lafourche Parish Government/ N. Lafourche Levee Conservation & Drainage District</i> <i>Archie Chaisson</i> <i>P.O. Drawer 5548</i> <i>Thibodaux, LA 70302</i> <i>985.537.2244</i></p>  <p><i>Lafourche Master Drainage Deliverable</i></p>	<p>The main objective of The Lafourche Parish Master Drainage Plan was to research available information and receive public input to develop computer models that represent the “backbone” of forced and gravity drainage systems to help the Parish plan future drainage improvements. Major tasks included public outreach, gathering new data, existing and proposed conditions modeling, GIS inventory (see photo below), and review of existing ordinances. In total the master drainage plan involved analyzed over 40 drainage areas with a total of 57 stormwater pump stations.</p> <p>Public outreach is a significant part of any public works project. Comment cards were distributed throughout the parish, a dedicated phone number was established, and monthly reports were given at council meetings. Four public meetings were held to gather and document public input on drainage concerns and problems. A review of current ordinances pertaining to drainage was not limited to only the parish level. Requirements of the incorporated municipalities of the City of Thibodaux, Town of Lockport, and the Town of Golden Meadow were also researched.</p> <p>To support the modeling effort, new survey data on main collection channels, such as cross sections, culverts, bridges, pump stations, etc., was collected. One hundred eighty-one (181) miles of collection canals resulting in 422 cross sections were surveyed. Eighty-four (84) miles of canals in the Chackbay gravity area, northeast of Thibodaux and Raceland, were cross sectioned resulting in 81 cross sections surveyed. Bridge and culvert crossings totaling 448, affecting the above-mentioned forced drainage collection and gravity channels were detailed for input into the models. All data was imported into the GIS inventory. Existing and proposed conditions were modeled using the U.S. Army Corps of Engineers (USACE) legacy model HEC-1 to develop rainfall runoff hydrographs from all sub-areas. The 4% annual chance event (25-year storm), 24-hour duration with a total depth of 10.8 inches according to National Weather Service Technical Paper No. 40 was used. Note that a rainfall event was modeled, not a surge event typically associated with a tropical storm.</p> <p>The USACE's legacy models UNET and HEC-RAS were used to route flows and determine peak water surfaces in the main collector channels of the larger forced drainage systems and gravity system around the Chackbay area. ESRI's ArcGIS 10 and the US Army Corps of Engineers HECGeoRAS were used to process field surveys and LiDAR elevational data. Individual maps associated with each system modeled depict aerial photography and colored LiDAR elevational data.</p>	
Completion Date (Actual or estimated):	Estimated Cost:	
2012 (actual)	Entire Project:	Work for which Firm was Responsible:
	N/A	\$750,000

TEC Professional Services Questionnaire

L. Work by Firm or Joint-Venture members which best illustrates current qualifications relevant to this Project. Please include any and all work performed for Jefferson Parish. Please attach additional pages if necessary.

PROJECT NO. 4

Project Name, Location and Owner's contact information:	Nature of Firm's Responsibility:	
<p>Vacherie Master Drainage Plan St. James Parish, LA</p> <p><i>St. James Parish Council Jody Chenier P.O. Box 106 Convent, LA 70723-0106 225.562.2262</i></p>   <p align="center"><i>Vacherie Master Drainage Site Images</i></p>	<p>T. Baker Smith was selected by St. James Parish in 2014 to provide a comprehensive drainage study for the West Bank areas of Vacherie, LA in response to high intensity, short duration rainfall events which occurred in 2014. The purpose of the study was to perform overall reconnaissance of the area, gather data, perform topographic surveys and utility locations affecting improvements, develop a hydrologic and hydraulic model of the area and provide recommendations for improvements to the overall drainage system. The drainage study encompassed nearly 10,000 acres comprised of gravity and forced drainage systems.</p> <p>TBS first performed a comprehensive topographic surveying and data collection phase which included site visits, resident interviews, surveying and observations of drainage patterns during several rainfall events. In total, nearly 200 miles of canals and drainage channels were surveyed including nearly 500 culvert/structure locations. Survey data was compiled onto field rolls and presented in AutoCAD and ArcGIS formats. Culvert and drainage structure data was also tabulated by reach or basin. Upon completion of data collection, TBS developed an existing conditions model of the area which included over 100 reaches, basins and sub basins.</p> <p>Once the existing condition models were completed, results were computed for the 10, 25, 50 and 100-year rainfall events. The model was also calibrated using actual data collected during rainfall events. After discussion with the Parish, several improvements were implemented into the model and an improved conditions model was developed. All modeling was performed using HEC-RAS and integrated into ArcGIS for display and future use within the Parish GIS system. In total, nearly 30 major improvement projects were recommended for improvements to the drainage system. A cost estimate for each project was provided, including cost for environmental permitting, utility relocation and design. The total estimated value of the improvements is near \$7,000,000.</p> <p>Services Provided:</p> <ul style="list-style-type: none"> • Topographic Survey • Site Reconnaissance • Hydraulic Modeling • Report Preparations 	
Completion Date (Actual or estimated):	Estimated Cost:	
2016 (actual)	Entire Project:	Work for which Firm was Responsible:
2016 (actual)	N/A	\$255,000

TEC Professional Services Questionnaire

L. Work by Firm or Joint-Venture members which best illustrates current qualifications relevant to this Project. Please include any and all work performed for Jefferson Parish. Please attach additional pages if necessary.

PROJECT NO. 5

Project Name, Location and Owner's contact information:	Nature of Firm's Responsibility:	
<p>St. Charles Master Drainage Plan St. Charles Parish, LA</p> <p><i>St. Charles Parish Miles Bingham 100 River Oaks Drive Destrehan, LA 70047 985.331.2624</i></p>	<p>TBS will develop detailed reports for each watershed which will be used to compile an overall Master Drainage Plan for the West Bank of St. Charles Parish.</p> <p>TBS has been selected to support St. Charles Parish Government in the development of a Master Drainage Plan (MDP). The MDP will analyze the existing gravity and forced drainage networks within the West Bank of St. Charles Parish and provide recommendations for improvements to these systems aimed towards mitigating flooding both for the existing conditions and due to future planned development. The West Bank of St. Charles Parish is comprised of approximately 21,000 acres of land (excluding marsh/swampland) and consists generally of 11 primary drainage basins, which will be analyzed separately in phases based upon their locations and similarities. The improvements recommended for each basin will be prioritized using multiple factors including implementation time, cost and anticipated benefit to their respective area, which when compiled into the MDP, can be utilized to prepare a comprehensive Capital Improvements Program. For each basin, TBS will be conducting a data gap analysis. TBS will use the data provided by the Parish, publicly available data and supplemental data collected by the data gap analysis to develop a hydrologic and hydraulic model of the watersheds. Upon completion of the H&H Analysis, TBS will prepare a report that summarizes the results of the modeling for each watershed. Included in the report will be conceptual level cost estimates, project priority list, and other recommendations for implementing the proposed improvements included in the proposed conditions modeling.</p> <div style="display: flex; justify-content: center; gap: 20px;">   </div> <p align="center"><i>St. Charles Drainage Site Images</i></p>	
Completion Date (Actual or estimated):	Estimated Cost:	
2021 (estimated)	Entire Project: N/A	Work for which Firm was Responsible: \$218,500

TEC Professional Services Questionnaire

L. Work by Firm or Joint-Venture members which best illustrates current qualifications relevant to this Project. Please include any and all work performed for Jefferson Parish. Please attach additional pages if necessary.

PROJECT NO. 6

Project Name, Location and Owner's contact information:	Nature of Firm's Responsibility:
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Colonial Club Ditch Pumping Station Survey
 Jefferson Parish, LA

Jefferson Parish Government
John O'Connor, PE
 1221 Elmwood Park Blvd.
 Suite 906
 Jefferson, LA 70123
 504.736.6833

TBS performed a topographic survey of the Colonial Club Ditch in Jefferson Parish, LA. The ditch drains a large residential area including a golf course. TBS collected data on the ditch itself, as well as other elements draining immediately into it, improvements within the area of the ditch, and utility information for those which might be affected by digging or widening of the ditch. The data was then processed and converted to CAIRO datum, due to the elevation of New Orleans, and brought into CAD for deliverable preparation. Plan views were created showing linework of improvements that were collected, elevation values, utility information, and contour lines of the surveyed area. They were delivered to the Parish and TBS' in-house engineers so that they could then evaluate the need and effectiveness of a pump station based on the existing drainage conditions.

- Services Provided:**
- Topographic Survey



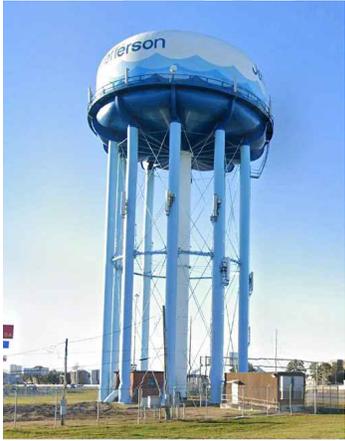
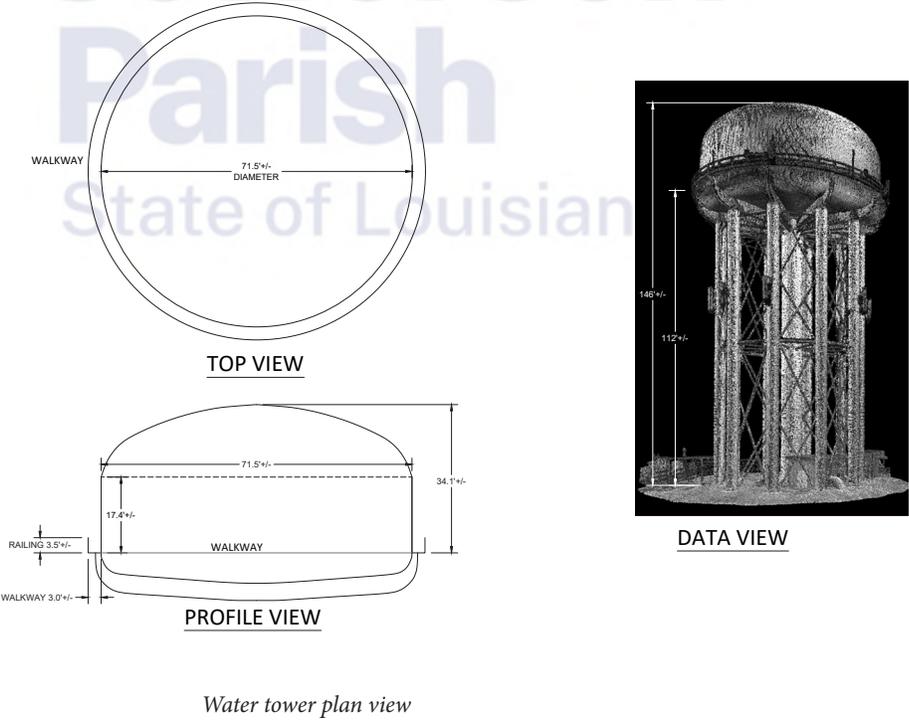
Colonial Club Topographic Deliverable

Completion Date (Actual or estimated):	Estimated Cost:	
	Entire Project:	Work for which Firm was Responsible:
2021 (actual)	N/A	\$18,000

TEC Professional Services Questionnaire

L. Work by Firm or Joint-Venture members which best illustrates current qualifications relevant to this Project. Please include any and all work performed for Jefferson Parish. Please attach additional pages if necessary.

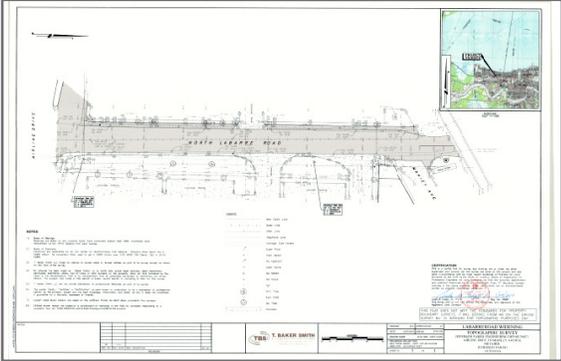
PROJECT NO. 7

Project Name, Location and Owner's contact information:	Nature of Firm's Responsibility:	
<p>Causeway Water Tower UAS Survey Jefferson Parish, LA</p> <p><i>Jefferson Parish Government Sidney J. Bazley III 1221 Elmwood Pk. Blvd. Suite 909 Jefferson, LA 70123 504.736.6060</i></p>  <p align="center"><u>GROUND VIEW</u></p>	<p>TBS performed a UAS Survey at the Causeway water tower to determine the general size of the water tower so an artist can render the new paint scheme.</p> <p>TBS' UAS crew deployed a multi-rotor drone to fly the extents of the water tower to collect data from the air. TBS then returned to the office, processed the data from the field services and produced the deliverable drawing.</p> <p>Services Provided:</p> <ul style="list-style-type: none"> • UAS Survey  <p align="center"><i>Water tower plan view</i></p>	
Completion Date (Actual or estimated):	Estimated Cost:	
<p align="center">2021 (actual)</p>	Entire Project:	Work for which Firm was Responsible:
<p align="center">N/A</p>	<p align="center">N/A</p>	<p align="center">\$2,500</p>

TEC Professional Services Questionnaire

L. Work by Firm or Joint-Venture members which best illustrates current qualifications relevant to this Project. Please include any and all work performed for Jefferson Parish. Please attach additional pages if necessary.

PROJECT NO. 8

<p>Project Name, Location and Owner's contact information:</p>	<p>Description of Services Provided:</p>			
<p>Jefferson Parish – Labarre Road Widening (Airline Dr. to Loumor St.) Jefferson Parish Project No. 2017-020-RBP Jefferson Parish, LA</p> <p><i>Jefferson Parish Government</i> Mark Drewes 1221 Elmwood Pk. Blvd. Suite 802 Jefferson, LA 70123 504.736.6500</p>  <p align="center"><i>Labarre Road Widening Project Site Photos</i></p>	<p>Labarre Road is heavily congested due to two major traffic-generating businesses on each side of the roadway. Jefferson Parish personnel decided that adding dedicated turn lanes will alleviate the issue.</p> <p>TBS conducted a topographic survey of Labarre Road, from the northern apparent right of way of Airline Drive to the southern apparent right of way of the rail road tracks, surveying from the back of curb on the western side of Labarre Rd. and to the back of the sidewalk on the eastern side of Labarre Road.</p> <p>TBS performed conceptual design of the turn lane improvements for review by Jefferson Parish Engineering Department. Upon completion of design phases, TBS will assist the Parish in bidding the project and will perform construction administration and resident inspection services during construction.</p> <p>Services Provided:</p> <ul style="list-style-type: none"> • Topographic Survey • Construction Cost Estimating • Design of Roadway Reconstruction • Utility Coordination  <p align="center"><i>Labarre Road Topographic Survey Deliverable</i></p>			
<p>Length of Services Provided:</p>	<p align="center">Cost of Services Provided:</p> <table border="1"> <tr> <td align="center">Entire Project:</td> <td align="center">Work for which Firm was Responsible:</td> </tr> </table>		Entire Project:	Work for which Firm was Responsible:
Entire Project:	Work for which Firm was Responsible:			
<p align="center">2021 (estimated)</p>	<p align="center">\$350,000 (estimated)</p>	<p align="center">\$350,000 (estimated)</p>		

TEC Professional Services Questionnaire

L. Work by Firm or Joint-Venture members which best illustrates current qualifications relevant to this Project. Please include any and all work performed for Jefferson Parish. Please attach additional pages if necessary.

PROJECT NO. 9

Project Name, Location and Owner's contact information:	Nature of Firm's Responsibility:	
<p>Eastbound West Esplanade Avenue Restoration (Tartan Drive to Haring Road) Jefferson Parish, LA</p> <p><i>Jefferson Parish Government Mark Drewes 1221 Elmwood Pk. Blvd. Suite 802 Jefferson, LA 70123 504.736.6500</i></p>  <p><i>Eastbound W. Esplanade Ave. Restoration Site Images</i></p>	<p>The eastbound lanes of West Esplanade Avenue between Tartan Drive and Haring Road are currently in less-than-desirable condition due to general wear and tear, various patch repairs and the overall age of the roadway. Jefferson Parish contracted TBS to restore and rehabilitate the roadway to like-new condition.</p> <p>In addition to designing the general removal and replacement of 9-inch concrete along the half-mile roadway segment, the project includes roadway profile adjustments to optimize driver comfort, upgrade of three cross drains to 42-inch RCP, heavy duty curbing, adjustment of various catch basins and manholes, ADA compliant handicap accessible curb ramps and sidewalk improvements, driveway removal and replacement, median drainage improvements, and relocation of street lighting.</p> <p>In addition to the above, TBS also performed the topographic survey of the site.</p> <p>Services Provided:</p> <ul style="list-style-type: none"> • Topographic Survey • Engineering Services • Construction Cost Estimating • Resident Inspection 	
Completion Date (Actual or estimated):	Estimated Cost:	
2020 (actual)	Entire Project:	Work for which Firm was Responsible:
	\$1,800,000 (construction)	\$144,000 (engineering & surveying fees)

TEC Professional Services Questionnaire

L. Work by Firm or Joint-Venture members which best illustrates current qualifications relevant to this Project. Please include any and all work performed for Jefferson Parish. Please attach additional pages if necessary.

PROJECT NO. 10		
Project Name, Location and Owner's contact information:	Nature of Firm's Responsibility:	
<p>Eastbound West Esplanade (Transcontinental to Causeway) Survey Jefferson Parish, LA</p> <p><i>Jefferson Parish Government Mark Drewes 1221 Elmwood Park Blvd. Suite 906 Jefferson, LA 70123 504.736.6833</i></p>	<p>The eastbound lanes of West Esplanade Avenue from Transcontinental Drive to Hudson Street, and Cleary Avenue to Severn Avenue are in need of rehabilitation due to general wear and tear resulting in heavy use. The existing road surface is covered in patches due to spot repairs over time, creating an uneven driving surface. Jefferson Parish contracted TBS to restore and rehabilitate the roadway to a like-new condition.</p> <p>TBS began by performing a detailed survey of the road surface along the desired stretches to provide designers with an existing profile of the road. Along with the existing road surface, utility information, drainage structures, sidewalks, and any other miscellaneous improvements were also collected so the designers would have a complete picture of the roadway corridor. These elements were then processed and displayed in plan and profile sheets that could be used as the basis of the construction plans by the designer.</p> <p>Upon completion of the survey TBS began working on construction plans to replace the worn roadway. These included a complete replacement of the 9 inch concrete panels and base material, along with associated curb and gutters in some sections. In others TBS was able to reduce cost and replace panels only where necessary. The design ensured proper tie ins with existing drives, uturns, and cross streets along the routes, as well as incorporating ADA compliant sidewalk access where necessary.</p> <p>Services Provided:</p> <ul style="list-style-type: none"> • Topographic Survey • Engineering Services • Construction Plans <div style="text-align: center;">  <p><i>Eastbound West Esplanade (Transcontinental to Causeway) Aerial View</i></p> </div>	
Completion Date (Actual or estimated):	Estimated Cost:	
	Entire Project:	Work for which Firm was Responsible:
2020 (actual)	N/A	\$63,675

TEC Professional Services Questionnaire

L. Work by Firm or Joint-Venture members which best illustrates current qualifications relevant to this Project. Please include any and all work performed for Jefferson Parish. Please attach additional pages if necessary.

PROJECT NO. 11

Project Name, Location and Owner's contact information:	Nature of Firm's Responsibility:	
<p>Retainer Contract for Professional Surveying Services Statewide LA</p> <p><i>Louisiana DOTD Joe Arretteig, P.L.S. P.O. Box 94245 Baton Rouge, LA 70804 225.379.1105</i></p>    <p align="center"><i>Surveyors On-Site</i></p>	<p>TBS was selected for a statewide surveying retainer contract in mid-2013 with the concentration of the work to be in Districts 02, 61 and 62. Under this contract, TBS performs topographic surveying, property surveys, right of way mapping, title research reports, title take offs, and title updates for LADOTD projects statewide. The limitation for fees is \$1 Million under this professional services contract, and projects are initiated via task order. TBS completes all deliverables using Microstation and Inroads as certified by CADconform. Some of the projects are listed below:</p> <ul style="list-style-type: none"> • S.P. No. H.011289, LA 70 Bypass (Detour Route), Route LA 70, Assumption Parish – Phase I: Topographic survey of +/- 1 Mile detour route including utilities, drainage structures and drainage maps for the LA 70 Bypass route through virgin/swampy terrain. Topographic Survey 100% complete. Phase II: Property surveys, location of property markers for properties crossed along proposed route, creation of base right of way maps for the proposed route. • S.P. No. H.009140.5, LA 1026 at LA 1030 Roundabout (Route LA 1026), Livingston Parish – title take offs, title research reports, title updates, property surveys and right of way maps for roundabout project in Denham Springs, LA. Final R/W maps were transmitted in early 2015. • S.P. No. H.002424, Sunshine Bridge to I-10, LA 70 and LA 22, St. James and Ascension Parishes – property surveys, right of way maps for 5 mile roadway widening project • S.P. No. H.002381.5, LA 43 Creek Bridge Near Albany (Route LA 43), Livingston Parish – title take offs, title research reports, title updates, property surveys and right of way maps for bridge replacement project. • S.P. No. H.009481, Bayou Chevreuil Bridge (Route LA 20), St. James Parish – +/- 3000 feet topographic survey of the existing roadway, bridge and channel including utility locations and drainage structures for bridge replacement project. • S.P. No. H.008149, Pier 1 Removal (Leeville Bridge), Route LA 1, Lafourche Parish – Establish control and perform hydrographic surveys using multi-beam and side scan sonar for pier removal of Leeville bridge. • S.P. No. H.004783, Arkansas Road (Caldwell Road LA – 143), Route LA 616, Ouachita Parish – Topographic survey including use of Ground Penetrating Radar (GPR) to locate potential subsurface cultural/historic features for roadway project. • S.P. No. H.001439, Bridges near Grand Isle, LA 1, Lafourche and Jefferson Parishes, LA (LADOTD) – Property surveys and right-of-way surveys for the removal of three bridge structures located along LA 1 in Jefferson and Lafourche Parishes near the town of Grand Isle. 	
Completion Date (Actual or estimated):	Estimated Cost:	
2016 (actual)	Entire Project:	Work for which Firm was Responsible:
2016 (actual)	N/A	\$1,000,000

TEC Professional Services Questionnaire

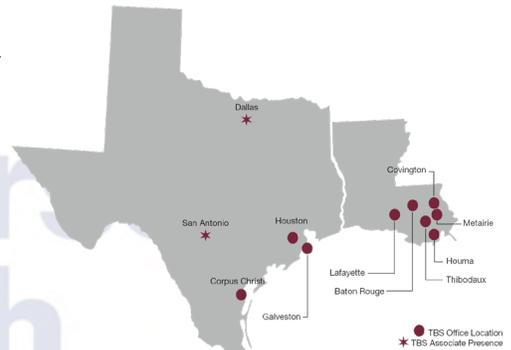
M. List all prior and/or on-going litigation between Firm and Jefferson Parish. Please attach additional pages if necessary.

Parties:		Status/Result of Case:
Plaintiff:	Defendant:	
Jefferson Parish Government	Swift Energy Operating, LLC; Double Eagle Marine, LLC; Tommie Vizier and Sons Towing Co, LLC; Premier Tugs, LLC; Daigle Towing Service, LLC; T. Baker Smith, LLC	Because TBS held a portion of the liability, Jefferson Parish offered a settlement, which we negotiated with them and which was approved by Jefferson Parish Council on April 30, 2014. Jefferson Parish prevailed in this litigation, which was settled out of court.

N. Use this space to provide any additional information or description of resources supporting Firm’s qualifications for the proposed project.

FIRM HISTORY

T. Baker Smith, LLC (TBS), an *Engineering News Record* Top 500 Design Firm, has provided professional surveying, engineering, environmental, and construction management services in Louisiana for the past century. TBS was founded in Houma, LA in 1913 and has since expanded to additional offices throughout the state of Louisiana as well as Texas. In 1936, our founder, T. Baker Smith, engineered the first paved road in Houma, LA. In the decades since then, the mission of “turning ideas into reality” for clients continues to challenge TBS’ professionals to remain on the cutting edge of technology, so that we can provide the most economically viable solutions to our clients. Additionally, TBS owns and maintains one of the largest fleets of work boats and all-terrain vehicles to get to the most remote work site locations.



Three generations of leadership and over 100 years later, the quest of providing superior, integrated, professional solutions is deeply engrained in the TBS culture.

PROFESSIONAL TRAINING AND EXPERIENCE

Our professionals hold degrees in civil engineering, mechanical engineering, structural engineering, mechanical engineering technology, geomatics, industrial technology, drafting and design technology, etc. All of our professionals have proper state registrations. These qualifications are exemplified in the resumes provided in Section K.

CAPACITY FOR TIMELY COMPLETION OF PROJECTS

TBS is committed to continuously improving project completion time and schedules. With approximately 230 associates and nine office locations firm-wide, we have sufficient staff and resources to handle the task associated with this RFQ. Our associates range from disciple leaders and lead professionals overseeing the quality of work, to project managers managing the project’s progress, to project technicians and assistants providing advanced technical support to get the job done. Our integral approach to projects allows us to communicate, manage, and use resources from various office locations on a daily basis. Additionally, TBS continues to recruit and employ highly qualified professionals to ensure continued growth of the quality services we provide to our communities.

LOCATION OF THE PRINCIPAL OFFICE

TBS will manage projects resulting from this request from our Metairie, LA office located at 740 Phosphor Avenue, Suite B, Metairie, LA 70001. Additional support can be provided from our other office locations in Thibodaux, Houma, and Prairieville as needed.

TEC Professional Services Questionnaire

N. Use this space to provide any additional information or description of resources supporting Firm's qualifications for the proposed project.

MINIMUM REQUIREMENTS

Requirement	TBS Associate
1. One principal who is a professional land surveyor, who shall be registered as such in Louisiana.	Kenneth Wm. Smith, PE, PLS, FACEC <i>Chief Executive Officer</i> <i>LA PLS.4772 exp.: 9/30/2022</i>
2. A professional in charge of the project who is a professional land surveyor, who shall be registered as such in Louisiana, with a minimum of five (5) years of experience in the disciplines involved.	David Martinez, PLS <i>Discipline Leader, Survey LA</i> <i>PLS.4614 exp.: 9/30/2023</i>
3. One employee who is a professional land surveyor, who shall be registered as such in Louisiana in the field or fields of expertise required for the project (A sub-consultant may meet the requirement only if the advertised project involves more than one discipline.)	Rene Hebert, PLS <i>Lead Professional, Survey</i> <i>LA PLS.5070 exp.: 2/28/2022</i>

ADVERSARIAL LEGAL PROCEEDINGS

As described in Section M above, TBS was involved in a legal matter with Jefferson Parish that was settled in April of 2014.

PRIOR SUCCESSFUL COMPLETION OF PROJECTS

TBS' team of professionals has many years of experience working on surveying projects in Louisiana. Projects highlighted in Section L exemplify our history of similar project experience and include:

Bucktown Harbor Survey Services – Bucktown Harbor is a partially reclaimed stretch of 30+ acres of lake bottom which forms a protected harbor on the south shore of Lake Pontchartrain in Metairie, LA. Currently a home base for the U.S. Coast Guard Station New Orleans and serving as a recreational and commercial fishing marina, the Harbor is largely undeveloped. This property provides opportunity to develop a vibrant waterfront gathering place, rich with tradition and honoring the history of the community. TBS provided the following survey services to support the redevelopment of the Harbor: Site-wide topographic land surveying; Single-Beam Hydrographic Surveys; Multi-Beam Hydrographic Surveys; 6(f) Boundary in Accordance with LWCF Guidelines; Shoreline Erosion Assessment (Ongoing); Aerial LiDAR surveys; Traditional Topographic Surveys; Bathymetric Surveys.



17th Street Canal Pilot Project - Hydrographic and LiDAR Surveys – TBS provided a bathymetric and aerial LiDAR survey on the 17th Street Canal "Site 1" test site in Jefferson Parish, LA. This survey provided FPA-E with the data necessary to evaluate the use of combined hydrographic and LiDAR survey methods to efficiently monitor the stabilization of the canal/floodwall system to USACE standards.



TEC Professional Services Questionnaire

N. Use this space to provide any additional information or description of resources supporting Firm's qualifications for the proposed project.

TBS remains on the cutting edge of technology and is equipped for the future to serve our clients today.



Conventional Equipment	QTY
18- to 21-foot survey vessels	12
24-foot survey vessels	5
24- to 28-foot survey barges	5
12 to 16-foot skiffs/25 HP motor	6
Airboats	5
Shallow-draft hydrographic/geophysical survey vessels	4
Deep-draft hydrographic/geophysical survey vessel	1
Marsh Master marsh buggies	2
Utility Vehicles (Rhino) & 4 Wheelers	14
GPS Total Stations	20
Differential GPS units	28
Single-frequency fathometer	10
Conventional Total Stations (EDM)	23
Robotic Total Stations	8
3D Terrestrial Laser Scanners	2
Drones (Unmanned Aerial Vehicles)	11
Triton Imaging, Inc. ISIS Sonar Software	4

Hydrographic/Geophysical Equipment and Software	QTY
Sontek (Argonaut)-SL500	3
Sontek (Argonaut)-SW	1
Marsh-McBirney, Inc. Flo-Mate (Model 2000 Portable Flometer)	2
YSI 600 LS (conductivity, salinity, gage level)	6
Klein Side Scan Sonar Systems	5
EdgeTech Sub-bottom Profiler Systems	3
Marine Magnetics SeaSPY Magnetometers	5
Odom Echotrac MK III Echo sounder	1
Odom Echotrac CV2000 Echo sounder	1
Odom Hydrotrac Echo sounder	9
Odom Digibar Pro Velocimeter	3
Trimble Model DSM-232 DGPS Receivers	4
HYPACK Hydrographic Survey Software Acquisition Packages	10
HYPACK Hydrographic Survey Software Processing Packages	5
HYPACK Hydrographic Multibeam Survey Software Acquisition Packages	2
Chesapeake Technology SonarWiz.Map+SBP Software	5
Triton Imaging, Inc. ISIS Sonar Software	4

Utility Designation Equipment	QTY
Radiodetection RD-8100	40
Ground Penetrating Radar RD-1100	1
Metrotech VM-850 PCL Kit	1
Vacmaster System 4000	1
Vermeer Vacuum Excavation Trailer	1
Schonstedt GA-52Cx Magnetic Locator	59
Gradiometers	15
Tinker Raser Oscillator	18

Unmanned Aerial Systems	QTY
Phoenix LiDAR AL-32 with DJI M-600 UAV	1
SenseFly Ebee (photogrammetry)	2
SenseFly eBee Plus RTK/PPK (photogrammetry)	2
Altavian Nova 7200 PPK (photogrammetry)	1
Dji M-210	1
DJI Inspire 1	3
DJI Mavic Pro	1

Mobile LiDAR	QTY
Phoenix LiDAR AL-32 w/ LADY BUG 360° Spherical Camera Mobile LiDAR System	1



TEC Professional Services Questionnaire

N. Use this space to provide any additional information or description of resources supporting Firm's qualifications for the proposed project.

FIRM SIZE

TBS currently has approximately 230 associates firm wide, our diverse project teams include civil, structural, mechanical, coastal, and environmental engineers; professional land surveyors; offshore surveyors; planners; environmental scientists; biologists; construction administrators; project representatives; and technical support personnel.

PAST PERFORMANCE ON PARISH CONTRACTS

TBS has chosen the best in each practice area to serve Jefferson Parish on survey task arising from this RFQ. Our project managers have worked together on numerous public works projects, including those in Jefferson Parish. TBS has the right blend of survey, engineering, planning, and environmental professionals to support Jefferson Parish in successful execution of tasks. TBS employs additional surveyors, civil engineers, environmental scientists, and technical support staff to fully support the key staff in executing the work arising from this RFQ. A list of past survey projects performed for Jefferson Parish include:

- Bucktown Boardwalk Survey Services
- Bucktown Harbor Survey
- Eastbound W Esplanade Ave. Restoration (Tartan to Haring) Survey
- Labarre Road Widening Survey
- Metairie Marsh Hydrographic Survey
- Bucktown Harbor 6(f) Boundary Survey
- West Esplanade (Transcontinental to Causeway) Survey
- Causeway Water Tower UAS Survey
- Colonial Club Ditch Pumping Station Survey
- Bucktown Harbor Entrance Hydrographic Survey

CONCLUSION

The foundation of our surveying and mapping practice is built around an appreciation of boundaries and the preservation of property rights. Since 1913, TBS has been surveying the land and waterways in and around our communities, bringing innovation, efficiency, and accuracy to every project.

With over a century of archived data, boundary records, and historical maps of the Gulf Coast region, TBS is able to raise the bar by utilizing the latest and most efficient methods for collecting and staking data points for property and topographic surveys. These methods range from conventional instrumentation to fully automated land- and aerial-based systems.

TBS has the resources and experience necessary to perform surveying services specific to this RFQ for Jefferson Parish. At TBS, our organization believes and is dedicated to the safety and well being of our community and the communities around us. We are dedicated to making the area we live in a better place and take great passion in doing what we can to help the citizens of south Louisiana.

Since 1913, TBS has provided public works solutions that improved the quality of life in the communities we helped build. With our 100 years of experience and passion for seeing our communities thrive, we ask for your trust in TBS to provide Jefferson Parish with integrated solutions for this projects.



O. To the best of my knowledge, the foregoing is an accurate statement of facts.

Signature: *David L. Martinez*
Title: Survey Discipline Leader

Print Name: David Martinez, PLS

Date: 3/14/2022

About AECOM

AECOM is the world's trusted infrastructure consulting firm, delivering professional services throughout the project lifecycle — from planning, design and engineering to program and construction management. On projects spanning transportation, buildings, water, new energy and the environment, our public- and private-sector clients trust us to solve their most complex challenges. Our teams are driven by a common purpose to deliver a better world through our unrivaled technical expertise and innovation, a culture of equity, diversity and inclusion, and a commitment to environmental, social and governance priorities. AECOM is a *Fortune 500* firm and its Professional Services business had revenue of \$13.3 billion in fiscal year 2021. See how we are delivering sustainable legacies for generations to come at [aecom.com](https://www.aecom.com) and [@AECOM](https://www.instagram.com/AECOM).